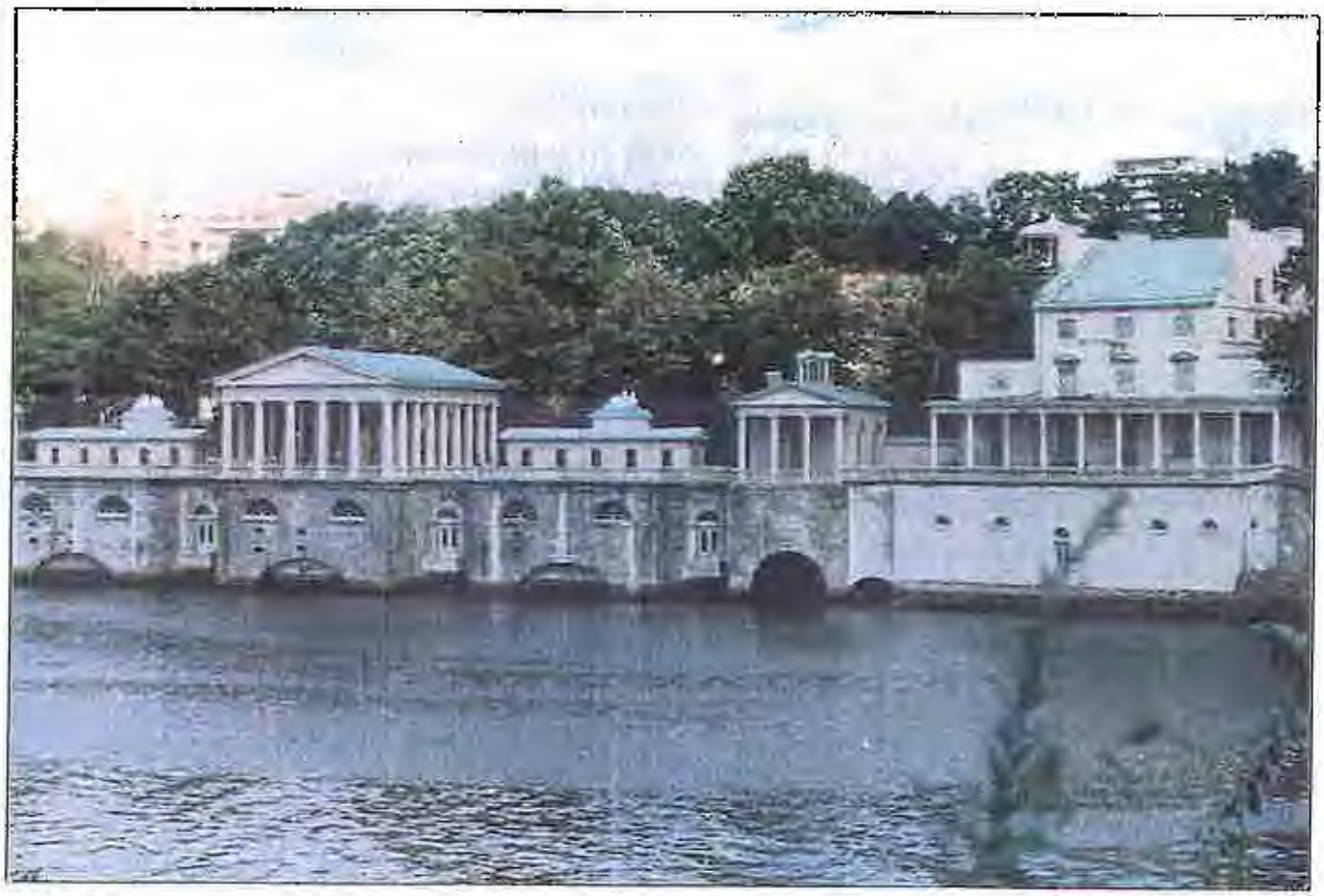
EXHIBIT P4

PHILADELPHIA WATER DEPARTMENT
ACT 537 PLAN DOCUMENTS

Philadelphia PWD Water Department



City and County of Philadelphia

Act 537 Plan

Volume 1

BCM Engineers Inc.
Engineers, Planners, Scientists, and Laboratory Services

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
FIELD OPERATIONS - WATER MANAGEMENT PROGRAM
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428
215 832-6130

November 10, 1993

Raymond E. Shipman, Managing Director
City of Philadelphia
1600 Arch Street, 12th Floor
Philadelphia, PA 19107

Re: Act 537 Plan
City of Philadelphia
Philadelphia County

Dear Mr. Shipman:

We have completed our review of your municipality's Official Sewage Facilities Plan entitled "City and County of Philadelphia, Act 537 Plan, Volumes 1 and 2" as prepared by BCM Engineers, Inc., dated March 1993 as revised May 1993 and additional information provided by letter dated June 30, 1993. The review was conducted in accordance with the provisions of the Pennsylvania Sewage Facilities Act.

Approval of the Official Sewage Facilities Plan is hereby granted.

The plan provides for the implementation of:

1. The intention to further evaluate existing unsewered areas and to prioritize addressing these areas in the future, including but not limited to investigating, on-a-case-by-case basis, the feasibility of individual hook-ups to central sewers.

2. The initiation of a Combined Sewer Overflow (CSO) Plan for the entire collection system, which included monitoring, modeling and high flow management, as described in your NPDES permits for your Water Pollution Control Plants.

3. The rehabilitation of the Primary Clarifiers at the Northeast Water Pollution Control Plant.

4. The establishment of a Rate Stabilization Fund.

5. The initiation of future joint planning in the event future intermunicipal agreements propose changes to the capacities outlined in Table 3.2.2 on page 3-44 of the Plan. For example, the PWD notified DELCORA by letter dated of,

termination of its agreement by 2006. Any such removal of sewage flows from the City's System will require the above referenced joint planning.

6. The processing of plan revision requests pursuant to 25 PA Code, Chapter 71, Section 71.51. The Department expects the City to fully comply with this requirement. A meeting with the Department and officials from the City's Water Department, Health Department and Planning Commission must be held within 60 days of the date of this letter.

Additionally:

1. The dry weather flow projection methodology in the plan is inconsistent with current Department Policy and Procedure. Annual average flow is the "nominal" design flow used in sewage facilities planning. Flow projections must be based on established annual average flows. NPDES permit revisions to incorporate maximum monthly average flow treatment plant capacity ratings will provide greater flexibility for treatment of peak hydraulic flows. Peak hydraulic flows being defined as a treatment plants three highest consecutive monthly average flows.

If you have any questions regarding this matter, please feel free to contact me at the above number.

Very truly yours,

Joseph A. Feola

JOSEPH A. FEOLA
Water Management Program Manager

cc: Philadelphia Water Department
Philadelphia County Health Department
Philadelphia County Planning Commission
BCM Engineers
Planning Section
Division of Municipal Facilities and Grants
Re 30 (SH)301.6

REPORT TO

CITY OF PHILADELPHIA
PHILADELPHIA WATER DEPARTMENT
PHILADELPHIA, PENNSYLVANIA

FOR

PHILADELPHIA
ACT 537

MARCH 1993
REVISED MAY 1993

BCM PROJECT NO. 00-0740-0201

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ACKNOWLEDGEMENTS

BCM wishes to acknowledge the effort and cooperation of all who assisted in or provided information for the preparation of this report.

The following is a list of major contributors:

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Philadelphia 537 Plan

Table of Abbreviations Used in Report

ASAP	As soon as possible
Ave.	Average
BAT.	Best available technology
BCT	Best conventional pollutant control technology
BCWSA	Bucks County Water & Sewer Authority
BOD_5, BOD	Biological Oxygen Demand
BPJ	Best professional judgement
BPT	Best practicable technology
CAAA	Clean Air Act Amendment
CCMUA	Camden County Municipal Utilities Commission
CDCA	Central Delaware County Authority
cf	Cubic feet
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CIP	Capital Improvement Plan
CM	Corrective maintenance
CMMS	Corrective management maintenance system
COWAMP	Comprehensive Water Quality Management Planning Program
CSO	Combined Sewer Overflow
CWA	Clean Water Act
D&M	Distribution and marketing
DAF	Dissolved air flotation
DCA	Darby Creek Authority
DCPC	Delaware County Planning Commission
DDX	Dichloro-diphenyl compound
DELCORA	Delaware County Regional Authority
DMR	Discharge monitoring report
DNREC	Delaware Department of Natural Resources and Environmental Control
DO	Dissolved Oxygen
DRBC	Delaware River Basin Commission
DSP	Digester sludge pumps
DVRPC	Delaware Valley Regional Planning Commission
EIS	Environmental impact statement
EPA	Environmental Protection Agency
ERP	Enforcement Response Plan
FM	Food to microorganism (ratio)

ABBREVIATIONS
(Continued)

FPS	Feet per second
FST	Final sedimentation tanks
ft_2	Feet squared
FY	Fiscal year
GC	Gas chromatograph
gpcpd	Gallons per capita per day
gpd	Gallons per day
gpm	Gallons per minute
HAPs	Hazardous air pollutants
HQ/EV	High quality/exceptional value
ICI	Industrial, commercial, institutional
I/I	Infiltration/inflow
IPP	Industrial Pretreatment Plan
IWU	Industrial Waste Unit
kg/ha	Kilograms per hectare
L	Length
lbs/day	Pounds per day
LOX	Liquid oxygen
max	Maximum
MG, mg	Million gallons
mg/l	Milligrams per liter
MGD, mgd	Million gallons per day
MLSS	Mixed liqour suspended solids
MLVSS	Mixed liqour volatile suspended solids
MOA	Memorandum of agreement
MPN	Most probable number
NE	Northeast
NEPA	National Environmental Policy Act
NEWPCP	Northeast Water Pollution Control Plant
NJDEPE	New Jersey Dept. of Environmental Protection and Energy
NL	Not limited
NOAEL	"No reasonable adverse effects level"
NPDES	National Pollutant Discharge Elimination System Permit
NSSS	National Sewage Sludge Survey
O&G	Oil and grease
O&M	Operations & maintenance
OLDS	On-lot disposal system
P&R	Planning and research
PADER	Pennsylvania Department of Environmental Resources

ABBREVIATIONS
(Continued)

PC	Personal computer
PECO	Philadelphia Electric Company
PENNVEST	Pennsylvania Infrastructure Investment Authority
PFRP	Process to further reduce pathogens
PIDC	Philadelphia Industrial Development Commission
PM	Preventive maintenance
POTW	Publicly Owned Treatment Works
ppd	Pounds per day
PSRP	Process to significantly reduce pathogens
PST	Primary sedimentation tanks
PTB	Primary treatment building
PWD	Philadelphia Water Department
QA/QC	Quality assurance/quality control
RACT	Reasonably available control technology
RAP	Remedial action plan
RBC	Rotating biological contactor
RST	Rotating sludge thickner
SCS	Soil Conservation Service
SE	Southeast
SEO	Sewage enforcement officer
SEWPCP	Southeast Water Pollution Control Plant
SIP	State implementation plan
SIU	Significant Industrial User
SNC	Significant non compliance
SOP	Standard operating procedure
SPDC	Sludge Processing & Distribution Center
SS	Suspended solids
SSES	Sewer system evaluation study
SW	Southwest
swd	Side water depth
SWWPCP	Southwest Water Pollution Control Plant
THM	Trihalomethane
TOMPs	Toxic Organic Management Plan
TRI	Toxics release inventory
UNOX	Commercial pure oxygen treatment system
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geologic Survey
VFD	Variable frequency drive
VOCs	Volatile organic compounds

ABBREVIATIONS
(Continued)

VSS	Volatile suspended solids
W	Width
WPCP	Water Pollution Control Plant
WPCRF	Water Pollution Control Revolving Fund
WWTP	Wastewater treatment plant

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1.0 EXECUTIVE SUMMARY

This ACT 537 Plan for the City and County of Philadelphia has been prepared pursuant to the Pennsylvania Sewage Facilities Act (Act 537) PL 1535. The Pennsylvania Department of Environmental Resources (PADER) is empowered with the statutory and regulatory authority to require such plans, which are, however, developed by municipalities and must be endorsed and/or implemented by the municipalities. On behalf of the City of Philadelphia, the Philadelphia Water Department (PWD) has therefore undertaken the preparation of this, the first, ACT 537 Plan for the City/County of Philadelphia.

The planning area of this ACT 537 Plan encompasses the entire City/County of Philadelphia, which are combined into one political entity under the Home Rule Charter. Moreover, it should be clearly understood that the PWD's wastewater conveyance and treatment system is regional in nature, encompassing an additional 10 agreements with municipalities and/or authorities in the surrounding Bucks, Delaware, and Montgomery Counties. However, as agreed upon with PADER and the PWD, this Plan does not address these outlying municipalities in planning considerations beyond an evaluation of the agreements themselves and how the terms of the agreements need to be addressed by the PWD's facilities. As will be shown in the Plan, the capacity needs for these outlying municipalities is less than the current agreement allocations.

Due to the regional nature of this Plan, the purpose and intent of this study is directed towards areas in which facility needs should be focused and a general assessment of future requirements in these areas. Generally, the three main areas of study included: (1) existing unsewered areas with the City, (2) the collection system, and (3) the water pollution control plants (WPCPs), including the Solids Processing and Distribution Center (SPDC). As indicated in Section 4.1, On Lot Disposal Systems, of the almost 675,000 residences in the City of Philadelphia, there have been approximately 2,450 households identified as having on-lot disposal systems (OLDS), which is less than 0.4 percent of the City's households. These are concentrated in seven identified areas of the City, located primarily in Roxborough/Manayunk, Germantown/Chestnut Hill, and the far Northeast. Whereas reported problems in all seven areas were less than 5 percent of the OLDS, the Philadelphia Health Department currently has adopted and enforces Chapter 73 of Title 25 of the Rules and Regulations of PADER, in part through the City Plumbing Code; there is no specific program alternative to otherwise eliminate these OLDS. The PWD, on a case-by-case basis, does investigate, in association with the Health Department, the feasibility of individual hookups to the existing sewer system. Furthermore, the PWD, as part of the selected plan, intends to further evaluate the OLDS areas to prioritize addressing these issues in the future.

The collection system encompasses approximately 2,955 miles of both separate sanitary, storm, and combined sewers. The nature of the combined sewer system, which includes 175-permitted regulator overflows, is such to prevent all dry weather overflows and, to the extent currently possible, minimize wet weather overflows. The PWD has implemented in the Northeast Drainage District a model program in which there are 45 monitored, and 8 automated regulators. The

future needs, as identified through the NPDES permitting process for the WPCP, is focused on a conceptual CSO Plan, and needs include such program elements as monitoring, modeling, and a high flow management system.

Regarding the WPCPs, there are several areas which require short-term measures and which have been identified in the Plan. In summary, these areas include the rehabilitation of the Primary Clarifiers at the Northeast Water Pollution Control Plant, corrective actions for redress of a Consent Order for the Southwest Water Pollution Control Plan, and various studies necessary for improving the performance of the SPDC. Overall, the PWD presently evaluates in-house, a 6-year Capital Improvement Program (CIP). This CIP provides the basis for ensuring proper maintenance of the facilities.

An overall (general) implementation schedule has been incorporated into the Act 537 Plan in Section 7.4.

Finally, regarding the financing of operations and improvements for the sewerage facilities, the City in 1989 enacted the General Water and Wastewater Revenue Bond Ordinance to modernize the requirements applicable to the City's Water and Sewer Revenue Bonds. This Ordinance establishes a rate covenant requiring that net revenues of the City's Water and Wastewater Systems exceed debt service requirements on all bonds by 20 percent, and establish a Rate Stabilization Fund.

BCM

2.0 GENERAL

2.1 INTRODUCTION

2.1.1 Background Authorization

On behalf of the City/County of Philadelphia, which were combined into one political entity under the Home Rule Charter, the Philadelphia Water Department (PWD) has prepared herein an Official Act 537 Sewage Facilities Plan. This Plan is mandated by the Pennsylvania Sewage Facilities Act (Act 537) PL 1535. More specifically, the Pennsylvania Department of Environmental Resources (PADER) has petitioned the PWD to submit an Act 537 Plan.

By proposal dated January 5, 1990, BCM Engineers Inc. (BCM), on behalf of the PWD, prepared a detailed scope and work plan; this scope was reviewed in detail with PADER and PWD representatives on April 6, 1990, and a subsequently revised scope of work was submitted to PADER by BCM on May 4, 1990. By letter dated July 30, 1990, the PWD work plan was approved by PADER and on August 8, 1991, the City of Philadelphia entered into a written agreement with BCM Engineers Inc. (Contract No. 91-6854) to prepare an Act 537 Sewage Facilities Plan for Philadelphia County. Unless designated otherwise in this report the term City will be utilized to mean both the City and the County of Philadelphia.

2.1.2 Regional Goals and Objectives of Wastewater Planning

The analyses and proposals of this Act 537 Plan are built upon the foundation of the following goals and objectives. It is felt that an effective planning document requires a well-established foundation of goals and objectives at the outset of the planning process to guide and unify the evaluation and recommendations for improvements. To this end, the following section provides the goals and objectives that will continue the Philadelphia Water Department's tradition of providing a proactive and effective wastewater collection and treatment program. Furthermore, these goals and objectives provide a common ground for the evaluation of each of the subjects and conditions considered in this Act 537 Plan.

2.1.2.1 Goal I: Protect Public Health

The goal of protecting the public health is consistent with PADER's sewerage facilities planning guidelines that state, "The main purpose of the Sewerage Facilities Plan of a municipality is to protect the health, safety, and welfare of the citizens living in the municipality."(1) The development and maintenance of well conceived sewage disposal systems have been very effective in eliminating and reducing waterborne diseases such as Typhoid, Cholera, and Giardia. To this end, the protection of the public against waterborne diseases, which result from the improper disposal of sanitary wastewater, is the prime motive behind the planning of any wastewater facilities.

Objectives in Meeting this Goal:

1. Maintain compliance with state, regional, and federal water quality standards that have been established with specific intended use plans.

2. Consider malfunctioning septic systems, employing the most practical and economical methods of remedy possible.

3. Provide proper operation and maintenance of municipal, non-municipal, and industrial wastewater treatment facilities.

4. Continue an aggressive and diligent contractual program for wastewater collection and treatment with those outlying municipalities and authorities that contribute flow to the Philadelphia Wastewater System.

2.1.2.2 Goal II: Protect Natural Resources

This goal is in compliance with Section 101 of the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500): "The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Philadelphia relies on its surface waters to generate future residential, commercial, and industrial growth, as well as to provide for a higher quality of life for its citizens.

Objectives In Meeting This Goal:

1. Utilize environmentally sound and cost-effective techniques to prevent the degradation of the Philadelphia surface and ground waters by maintaining water quality with established stream standards.

2. Promote an aggressive Industrial Pretreatment Program.

3. Identify and foster institutional arrangements for implementation of regional or basin-wide water quality plans.

4. Institute water conservation legislation to promote a reduction in water usage to ensure the future availability of water resources.

5. Encourage land and water resource management that is compatible with the protection of the region's water resources.

6. Encourage the protection of wetlands, wild areas, natural areas, parks, and other resources that may be fragile or endangered.

7. Manage, operate, and maintain the combined sewer system to comply with all applicable Federal, State, and City regulations.

8. Identify and protect those surface waters and water courses that have been set aside for recreational purposes, and allow for special consideration and care in those areas to protect the water quality.

2.1.2.3 Goal III: Provide Consistent and Appropriate Wastewater Planning

This goal for consistency in wastewater planning is essential in developing a comprehensive sewage facilities plan. The purpose and effort of this Act 537 Plan are directed to result in an effective coordination of future development and redevelopment of the planning area with available and proposed wastewater facilities. Therefore, every effort is to be made to consider and incorporate the myriad of factors impacting the Philadelphia Wastewater System. The PADER Sewerage Facilities Guide states, "A less obvious, but equally important, purpose of the Sewerage Facilities Plan is to prevent future sewerage disposal problems from occurring."(1)

The Objectives in Meeting this Goal:

1. Comply with the State Water Plan and Regional Southeastern Pennsylvania COWAMP/208 Water Quality Management Plans.

2. Comply with the Delaware River Basin Commission standards to preserve the Delaware River Estuary.

3. Compile, track, and adjust as necessary population, housing, commercial, industrial, and institutional growth projections to ensure that the collection and treatment systems are adequate to handle the expected wastewater loads.

4. Solicit problems and comments from the Philadelphia Health Department and regional and local planning agencies.

5. Confirm consistency with the documents and plans as detailed in Chapter 71, Section 71.21,a.5 PADER "Title 25: Rules and Regulations"

6. Be cognizant of and proactive with pending water quality standards and regulations.

2.1.3 Specific Project Focus

The overall goal of the proposed work effort is to prepare a sewage facilities plan that will meet the requirements established by PADER and all guidelines for Act 537 planning and to identify regional goals and objectives of Waste Water Planning. The sewage facilities plan will identify

existing and future needs, as well as improvements that must be initiated over the next 5 years to ensure adequate water pollution control within the City of Philadelphia.

To accomplish the purpose, PWD has determined to focus on the following objectives:

- To develop a plan based, to the maximum extent possible, on already existing data and reports. The PWD, which is the lead and host agency for this study, has extensive data already in place.

- To focus on those key problems and issues identified by PADER to ensure the conservation of study resources and compliance with a reasonable timetable for completion. It is not advisable to spend study resources on issues that are of little or no significance to Philadelphia; efforts should be placed upon the critical issues most meaningful in terms of pollution control and compliance with state and federal regulations.

- To conduct the work within the schedule and budgetary constraints mutually established by the City and the selected consultant.

- To comply with the City's Minority Business Enterprises/Women-owned Business Enterprises (MBE/WBE) goals set for this project.

As such, the City of Philadelphia is being required to prepare a county-wide sewage facilities plan. This plan must provide Philadelphia with a document that is usable and meets the City's needs of assuring PADER that any near future (5-year) capital improvement projects are consistent with both the State's planning requirements and the needs of the Philadelphia area. As there is no existing Act 537 Plan for Philadelphia County, the proposed sewage facilities plan will be a new document, essentially updating the existing regional water quality management and 201 Facility Plans for the Philadelphia wastewater collection, treatment, and disposal system.

The City of Philadelphia has indicated, for work plan purposes, that the only improvements currently being planned are for modifications (rehabilitation) to the primary clarifiers at the Northeast Water Pollution Control Plant (Northeast WPCP).

Although Philadelphia is essentially fully developed, PADER has requested that one primary focus of the sewage facilities plan include on-lot disposal systems in the City. Thus, among other Act 537 Plan requirements, the study will focus on the remaining unsewered areas, such as portions of Roxborough, Manayunk, and Chestnut Hill, and on any problems associated with on-lot disposal system malfunctions.

Other than the above, the County of Philadelphia Act 537 Plan is intended to serve as a general regional planning document, establishing policy, goals, and the need for further, more detailed investigations of specific long-term problem areas.

2.2 PLANNING AREA DELINEATION

The planning area of this Official Act 537 Plan encompasses the entire City/County of Philadelphia, which were combined into one political entity under the Home Rule Charter. The City of Philadelphia is committed to provide wastewater service to the population, commercial properties, institutions, and industries within its boundaries and to protect the waters into which treated wastewater is discharged. As can be seen on Figure 2.2-1, Planning Area Delineation, the City of Philadelphia is located in southeast Pennsylvania at the confluence of the Delaware and Schuylkill Rivers, bounded by Bucks County, Montgomery County, Delaware County, and the State of New Jersey.

The City itself is contained by the Delaware River on its eastern and southern boundary. At Fort Mifflin, near the Southwest WPCP, the City's boundary deviates from the Delaware River, continues west through the Philadelphia International Airport to Darby Creek, completing the southern boundary. Darby Creek forms the lowest portion of the western boundary and separates the City from Delaware County to its confluence with Cobbs Creek, where the latter creek continues as the western boundary northward to U.S. Route 1, City Line Avenue. City Line Avenue reverses north eastward to the Schuylkill River and marks the boundary with Montgomery County. The City boundary bisects the Schuylkill River up to the vicinity of Northwestern Avenue in a northeast direction to Stenton Avenue. Stenton Avenue is the northern boundary of the City as it turns southwest to slightly south of Willow Grove Avenue, then back to a northeast direction for a short distance to Cheltenham Avenue. The boundary follows Cheltenham Avenue southwest of Tookany Creek Parkway where it turns northeast a short distance to Cottman Avenue to Burholme Avenue. The boundary follows Burholme Avenue for a short distance, then continues northwest to Poquessing Creek. Here the boundary follows Poquessing Creek back to the Delaware River, completing the northern boundary and forming the divide with Bucks County.

As described later in this report, the City of Philadelphia has entered into intermunicipal agreements with ten outlying municipalities/authorities to accept, convey, treat and dispose of their wastewater; however, this official plan does not address these municipalities in planning considerations beyond an evaluation of the agreements themselves and how the terms of these agreements will need to be addressed by the PWD's facilities. Figure 2.2-2 Philadelphia Regional Service Areas also delineates those areas that are serviced by the Philadelphia collection and treatment facilities. Together, the City and outlying municipalities form the large watershed of the Lower Delaware and Lower Schuylkill Rivers and the largest regional wastewater system in Pennsylvania.

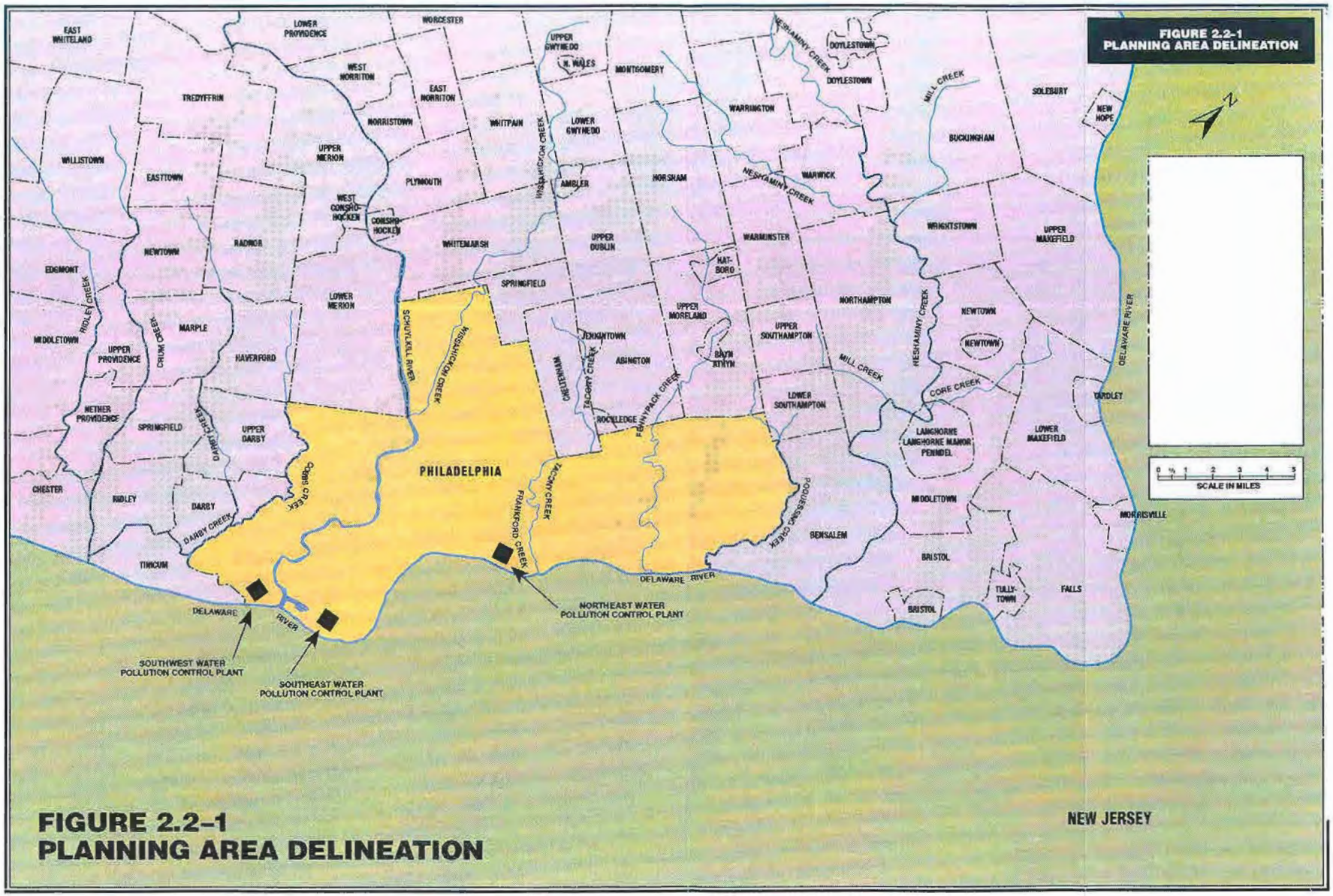

FIGURE 2.2-1
PLANNING AREA DELINEATION

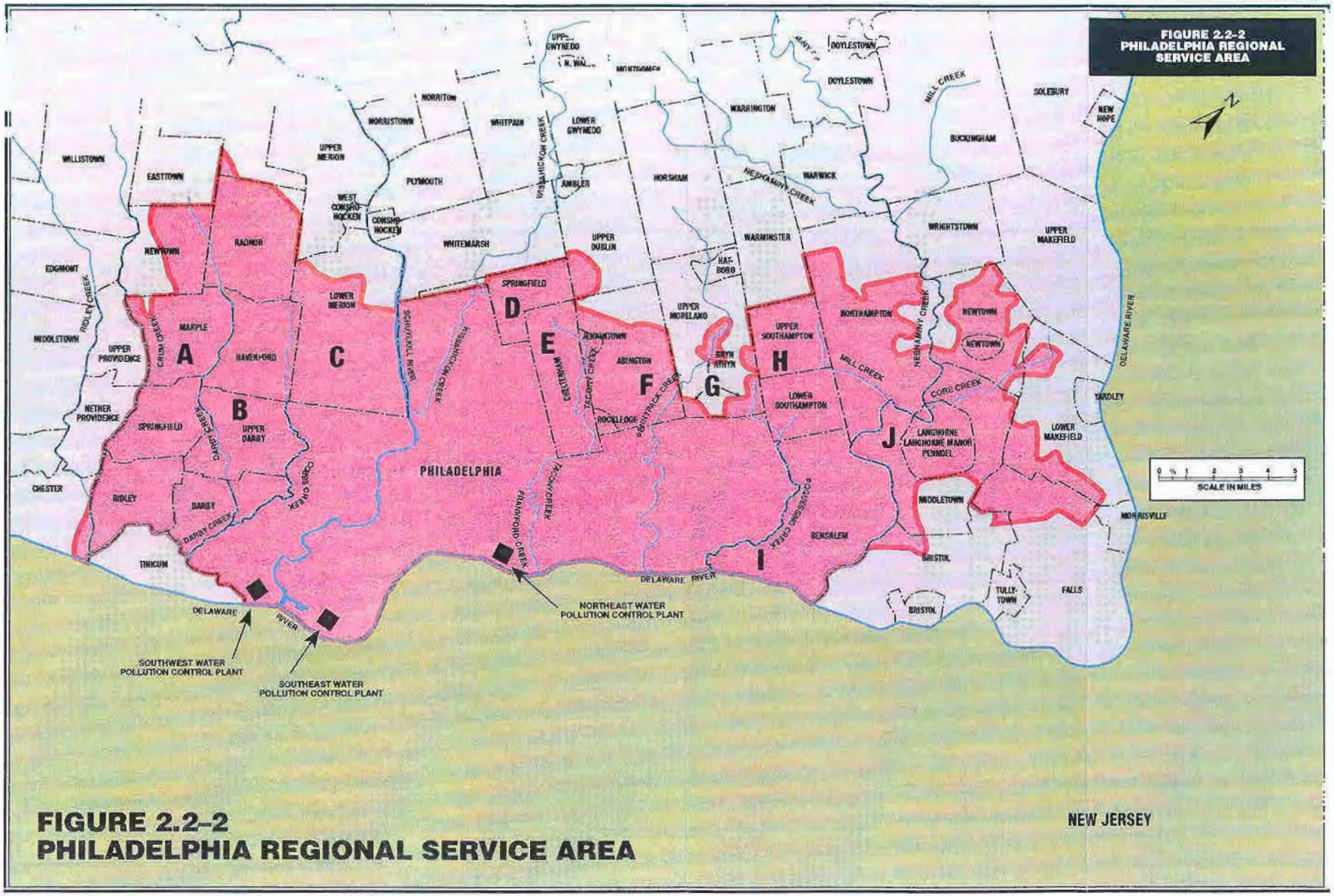

FIGURE 2.2-2
PHILADELPHIA REGIONAL SERVICE AREA

The total area and population served by the Philadelphia wastewater collection and treatment system, is summarized below:

	Area (acres)	Population
Philadelphia	86,500	1,586,000
Outlying municipalities	147,700	700,000
TOTAL	**230,600**	**2,286,000**

2.3 WORK PLAN

The following describes the effort required for the various tasks in this project. These tasks generally conform to PADER Act 537 Planning Guidelines and have been approved by PADER and the PWD.

2.3.1 Task 1 - Planning Objectives and Needs

The Plan includes a review of all wastewater planning previously conducted under the Federal Construction Grants Program and the State's Chapter 94 Wasteload Management Program. In addition, the plan reviews Philadelphia land use plans and zoning and identifies inconsistencies between wastewater plans and land use plans, zoning plans, or other local or regional plans. This task also incorporates the efforts required to obtain information on the outlying municipalities and refine the focus and objectives of the Plan with PADER and the regional planning agencies.

2.3.2 Task 2 - Physical Description of the Planning Area

The plan as proposed will present information on the planning area, such as the delineation of the service area, municipal and county boundaries, major drainage basins, and areas served by the City's three Wastewater Treatment Facilities.

For the portions of Roxborough, Manayunk, and Chestnut Hill, where the majority of on-lot sewage disposal facilities are in use, the Plan describes soils and general geological features based on information from United States Geologic Survey (USGS) and Soil Conservation Service (SCS) maps.

The Plan is based upon Planning Commission population information for the City as a whole and, as available, for growth areas within the City. Flows for outlying municipalities that contribute wastewater to Philadelphia have been reviewed based upon information available to the City as supplied by areas outside Philadelphia but within the Water Department service area.

Areas served by centralized water systems within the City of Philadelphia sewer service area have been identified.

The Plan includes a desktop study as a means of identifying wetlands throughout the service area using the National Wetlands Inventory (NWI) mapping system. However, it should be noted that before any construction is undertaken for a proposed facility, a site must be inspected, all wetlands delineated, and all appropriate permits obtained.

2.3.3 Task 3 - Evaluation of Existing Wastewater Treatment and Collection Systems

City of Philadelphia Health Department records have been reviewed to identify areas with on-lot sewage disposal systems and documented system malfunctions.

The Plan identifies and describes major interceptors, force mains, and pumping stations within the City of Philadelphia. PWD maintenance records have been consulted to identify any existing or potential future overload conditions.

The annual Wasteload Management Reports from the City of Philadelphia have been used to identify and describe the existing wastewater treatment facilities and problems related to National Pollutant Discharge Elimination System (NPDES) Permit violations. Violations are discussed along with the status of any actions taken to achieve compliance with treatment requirements. Previous studies and reports pertaining to operation and maintenance at the City's Water Pollution Control Plants (WPCPs) are reviewed and summarized in the Plan.

A listing of all direct industrial discharges within the City of Philadelphia have been obtained from the Water Department and incorporated into the Plan. Unpermitted collection/disposal systems within the City, if possible, are identified through review of the Water Department Industrial Waste Unit's records.

2.3.4 Task 4 - Evaluation of Wastewater Treatment Needs

The Plan delineates areas where sewerage systems may be needed within 5 years. These areas will be determined based on financial feasibility, Sewage Enforcement Office (SEO) information, the extent of illegal sewage connections, and a review of planning work completed under the Federal Construction Grants Program to establish sewage needs.

The Plan also evaluates wastewater treatment needs in terms of treatment plant capacity and degree of treatment required as described in the annual Wasteload Management Reports. In addition, the flow records and equivalent population figures shown in the Annual Reports and Infiltration/Inflow (I/I) reports are referenced to assess the infiltration and inflow in the collection system.

2.3.5 Task 5 - Alternative Evaluation as Required

The City has been directed by PADER to examine alternatives to meet its 5-year wastewater facility needs. As a means of representing the level of effort typical to this aspect of the Act 537 Plan, we will describe two "hypothetical" alternatives and our approach towards evaluation.

A typical plan will, for example, identify and analyze the need for additional primary tanks at the Northeast WPCP, and for extension of the collection system in the Northwest part of the City, i.e., portions of Roxborough, Manayunk, and Chestnut Hill. The plan will evaluate facility alternatives for consistency with county, state, and regional programs. It will evaluate the feasibility of each alternative and present an economic analysis, as appropriate. The plan will also analyze the potential recreation and open-space opportunities in the planning of the proposed facilities.

2.3.6 Task 6 - Institutional Evaluation

The institutional evaluation involves identification of existing public organizations and governmental authorities providing wastewater treatment services. Each entity is analyzed in terms of such factors as:

- Present indebtedness and potential borrowing capability
- Staffing and administrative resources
- Legal authority to implement planning recommendations
- Legal authority to operate, maintain, inspect, and test treatment facilities
- Legal authority to collect revenues, implement provisions of adopted ordinances, and negotiate with sewer users

The Plan recommends administrative and legal activities to ensure Plan implementation, as necessary, and identify methods of financing construction and operation of the sewerage system.

2.3.7 Task 7 - Select Wastewater Treatment and Institutional Alternatives

The Plan identifies and describes the technical and institutional alternatives of choice that are necessary to meet the 5-year needs. This selection is based on all information reviewed and described previously herein.

2.3.8 Task 8 - Implementation

A schedule is developed for carrying out the recommended Official Plan. The schedule includes milestone dates for design, construction, and startup of any capital facilities designated in the 5-year plan. In addition, a schedule for initiation of any feasibility studies is proposed.
In terms of the funding application process, the Plan identifies milestone dates for both the primary and secondary sources of funding.

2.4 WASTEWATER FACILITIES LEGISLATION, REGULATION, AND RESPONSIBILITY

The following is a synopsis of the federal, regional, state, and local standards and regulations that control the planning, permitting, construction, and operation of wastewater facilities in Philadelphia County. Although many of the pieces of legislation examined pertain to the overall protection of water quality, only those aspects relating to wastewater facilities are discussed herein.

It should be noted that recent regulatory proposals dealing with specific wastewater related topics have been incorporated into Section 6.4 of this Plan.

2.4.1 Federal Standards and Regulations

2.4.1.1 Clean Water Act

The most significant federal legislation pertaining to water quality is the Clean Water Act. This Act is essentially a compilation of amendments that have been made over the years to the 1948 Federal Water Pollution Control Act. The most important amendments occurred in 1972, 1977, 1981, and 1987. The 1977 amendments included the renaming of the Act to the Clean Water Act. The administrator of the Act is the U.S. Environmental Protection Agency (EPA).

As it presently stands, the Act consists of six titles. Title I specifies the prime objective of the Act: "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To achieve this objective, several national goals are declared, including:

- Waters should be fishable and swimmable by 1983.
- The discharge of pollutants to waters should be eliminated by 1985.
- The discharge of toxic pollutants in toxic amounts should be prohibited.
- Federal financial assistance should be provided for the construction of public wastewater facilities.
- Area-wide waste treatment management planning should be developed and implemented.
- A major research and demonstration effort should be made to develop the technology necessary to eliminate the discharge of pollutants.

Title II of the Clean Water Act establishes procedures for federal assistance for public wastewater facilities and authorizes funding appropriations for projects under this Title. Section 208 of Title II directs states to develop areawide wastewater management plans for areas identified as having

water quality control problems. Such a plan was conducted by the Delaware Valley Regional Planning Commission for southeastern Pennsylvania (including Philadelphia County). That plan is titled COWAMP/208: Water Quality Management Plan, Southeastern Pennsylvania (1980).

The main purpose of Title III is to establish effluent limitations for public dischargers, industrial waste and non-public dischargers, industrial users of public wastewater facilities, and toxic pollutants applicable to all dischargers. Title III also requires states to set water quality standards for state streams (based on protected uses of streams) in accordance with, or more stringent than, federal criteria. In addition, enforcement, inspection, and monitoring activities are prescribed to ensure compliance with the Act.

Title IV establishes the National Pollutant Discharge Elimination System (NPDES), which provides for the issuance of permits for discharges, to ensure compliance with effluent limitations. Title IV also provides for the establishment of ocean discharge criteria, permitting of dredged or fill materials (administered by the U.S. Army Corps of Engineers), and control of sewage sludge disposal.

Title V contains general provisions for administration of the Act. It establishes a water pollution control advisory board that assists the EPA in administering the provisions of the Clean Water Act. In addition, this title requires the submittal of reports to Congress on the measures that have been taken to implement the objectives of the Act.

Through the 1987 amendments to the Act, Title VI establishes provisions for the EPA to make capitalization grants to each state for the purpose of developing water pollution control revolving funds. The revolving funds are to provide assistance for construction of public wastewater facilities, implementation of non-point source management programs, and development and implementation of conservation and management plans for estuaries for national significance.

In addition, Section 320 of the Federal Water Quality Act establishes a National Estuary Protection Program to promote long-term planning and management in nationally significant estuaries that are threatened by pollution, development, or overuse. The overall goal of the program is to protect and improve the water and sediment quality of these estuaries, thus enhancing the living resources of the Nation. The Act specifically names estuaries that are to receive priority consideration by the EPA for inclusion in the program. The Delaware Bay was included in the list. A significant portion of the contributing flow to the Delaware Bay has its origin in Pennsylvania watersheds, including the City of Philadelphia and its associated planning area.

Pennsylvania is cooperating with New Jersey, Delaware, and the EPA to develop a Comprehensive Management Plan for the Delaware Estuary. This plan will include Pennsylvania's strategy to integrate the Federal Water Quality Act's initiatives for the Delaware Bay into its ongoing water quality management program activities. The intended result is the development of a comprehensive conservation and management plan that recommends priority corrective actions and compliance schedules addressing point and non-point sources of pollution to restore and maintain the chemical, physical, and biological integrity of the estuary. Plan goals will include

restoration and maintenance of water quality; establishment of a balanced indigenous population of shellfish, fish, and wildlife; and enhancement of recreational activities in the estuary. In addition, the plan will ensure that the designated uses of the estuary are protected. These plans will be reviewed by the EPA and will be implemented in accordance with schedules established in the plan.

2.4.1.2 National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 provides for the consideration of environmental consequences of federal actions by requiring that all federal agencies submit an Environmental Impact Statement (EIS) for any project that directly or indirectly affects the human environment and uses federal funding, federal land leasing, or required federal permits for operation. EISs include a discussion of the positive and negative effects on the environment resulting from proposed projects and alternatives to the projects. As administrator of the construction grants program under Title II of the Clean Water Act, the EPA is the reviewer of EISs on wastewater projects having significant environmental impact and requesting federal subsidy.

2.4.2 Regional Standards and Regulations

2.4.2.1 Delaware River Basin Commission

The Delaware River Basin Commission (DRBC) has the responsibility under an interstate compact to manage the water and water-related resources of the Delaware River Basin. Its members include the governors of Pennsylvania, New York, New Jersey, and Delaware and an appointee of the President of the United States. It is the intent of DRBC to adopt uniform and coordinated policies for water conservation, control, and use and management in the basin (including those for water supply, water pollution control, flood protection, watershed management, recreation, hydroelectric power generation, water withdrawals, and diversions), in addition to establishing standards for the planning, development, and financing of water resource projects according to such plans and policies.

2.4.2.2 COWAMP/208 Regional Water Quality Management Plan

The COWAMP/208 program has its origin in the Clean Water Act. The "208" portion of the program's name refers to Section 208 of the Act, which provides for areawide waste treatment management programs. The "COWAMP" portion of the name refers to the Comprehensive Water Quality Management Plan, a statewide program initiated by the Pennsylvania Department of Environmental Resources (PADER) in 1974. Aimed at evaluating water quality in a comprehensive manner, both programs deal with pollution sources such as urban storm water runoff, agricultural pollution, and wastewater treatment discharges.

In southeastern Pennsylvania (including the City of Philadelphia), these two programs were combined into a single plan - the COWAMP/208 Water Quality Management Plan. This plan was prepared by the Delaware Valley Regional Planning Commission and approved by the Governor

and EPA in 1980. It has provided a framework for water quality management in the region since that time. Although wastewater projections produced in the plan may be out of date, the Clean Water Act requires that wastewater facilities be consistent with this plan and any differences be addressed and justified.

2.4.3 State Standards and Regulations

2.4.3.1 Clean Streams Law

The most significant State legislation pertaining to the protection of water quality is the Pennsylvania Clean Streams Law. The law was enacted on June 22, 1937, and has been amended several times through the 1980s. The purpose of the law is to preserve and improve the purity of waters in the Commonwealth. It declares that the discharge of sewage, industrial wastes, or any substance that causes or contributes to water pollution is not a reasonable or natural use of water, is against public policy, and is a public nuisance. To ensure compliance with the law, the State granted PADER the authority to formulate, adopt, and enforce rules and regulations; establish policies and priorities; and issue orders or permits for pollutant discharges. PADER also has the authority to establish policies for effective water quality control and management in the Commonwealth and to develop and implement comprehensive plans for public water supply and waste management (e.g., Comprehensive Water Quality Management Programs [COWAMPs]). Fines, civil penalties, bond forfeitures, and permit fees are paid into a Clean Water Fund that, in turn, is used to eliminate pollution.

The rules and regulations promulgated by PADER in accordance with the Clean Streams Law are contained within Chapters 91 through 103 of PADER's "Title 25: Rules and Regulations." The following listed chapters are specifically related to discharges of pollutants:

- Chapter 91: General Provisions - Administration of the Clean Streams Law
- Chapter 92: National Pollutant Discharge Elimination System (NPDES) - Permits are required for point source discharge of pollutants. Monitoring may be required.
- Chapter 93: Water Quality Standards - Establishes protected uses for waters of the Commonwealth and sets safe concentration limits for pollutants. Wasteload allocation and ambient stream concentrations are used to establish effluent limitations.
- Chapter 94: Municipal Wasteload Management - Requires wastewater facility owners/operators to manage wasteloads, submit an annual report to PADER, submit a plan to reduce overloads, and develop and implement an industrial waste pretreatment program. Allows PADER to impose a ban on connections to wastewater treatment facilities under certain conditions.

- Chapter 95: Wastewater Treatment Requirements - Specifies treatment requirements for dischargers; prescribes phosphorus limitations for discharge to lakes, impoundments, and streams.

- Chapter 97: Industrial Wastes - Establishes treatment requirements for industrial discharges and specifies pretreatment standards for industrial wastes discharged to public wastewater facilities.

- Chapter 101: Special Water Pollution Regulations - Establishes regulations for pollution incidents, activities utilizing polluting substances, impoundments for polluting substances, and agricultural pollution control.

2.4.3.2 Pennsylvania Sewage Facilities Act

The Pennsylvania Sewage Facilities Act of 1966 (as amended), more commonly referred to as "Act 537," is the primary legislation regulating individual and community sewage disposal systems and sewage facility planning in general. The Act requires municipalities to submit (individually or jointly) official sewage facilities plans to PADER for approval and to provide plan revisions when necessary. Residents or property owners may also request PADER to require a municipality to revise its official plan. Official sewage facilities plans are required to determine the existing and future sewerage needs of the municipality(s) and develop wastewater facility alternatives to address these needs, taking into consideration municipal land use planning, existing state plans, population estimates, engineering, and economics. These plans are to be reviewed by appropriate planning agencies, including an areawide planning agency. PADER is also authorized to administer grants to counties, municipalities, and authorities to assist in the preparation of official plans and revisions to these plans. The reimbursement for costs incurred through plan preparation will equal one-half of the total cost.

The Act requires that permits be issued for the construction, installation, or alteration of individual and community wastewater systems. The Act also establishes a state advisory committee that reviews proposed and existing rules, regulations, standards, and procedures. Rules and regulations regarding community and individual systems are developed by PADER and adopted by the Commonwealth's Environmental Quality Board. In addition, a State Board of Certification of Sewage Enforcement Officers is created to administer sewage enforcement officer certification programs. There are also provisions for issuing penalties and civil suits for violations of the Act in addition to provisions for hearing complaints and appeals for persons aggrieved by the action of Sewage Enforcement Officers.

The rules and regulations promulgated by PADER in accordance with the Pennsylvania Sewage Facilities Act are contained within Chapters 71, 72, and 73 of PADER's "Title 25: Rules and Regulations." The following list briefly summarizes the provisions of these chapters:

- Chapter 71: Administration of Sewage Facilities Program - Provides for a comprehensive planning mechanism for solving and preventing sewage disposal problems. Specifies various requirements for revision of official sewage

facilities plans and for acquiring planning grants. Specifies regulations pertaining to the use of holding tanks.

- Chapter 72: Administration of Sewage Facilities Permitting Program - Provides for the issuance of permits for subsurface sewage disposal systems and retaining tanks. Specific permitting responsibilities and procedures of local agencies and Sewage Enforcement Officers are detailed. Regulations for rural residence systems are also included.

- Chapter 73: Standards for Sewage Disposal Facilities - Establishes requirements for the design, location, and construction of sewage facilities to be administered by Sewage Enforcement Officers.

2.4.3.3 Pennsylvania Infrastructure Investment Authority Act

The Pennsylvania Infrastructure Investment Authority (PENNVEST) Act (Act 16) was signed into law on March 1, 1988. The Act creates a 13-member board that coordinates state appropriations, federal funds, and bond authorizations that can be used to assist municipalities in the financing of wastewater and water system construction, improvements, and expansion.

Moreover, the Act is now being implemented as regulated through the Pennsylvania code, "Title 25, Chapter 963, Pennsylvania Infrastructure Investment Authority."

The Delaware Estuary Program, previously discussed in Section 2.4.1.1, has a potential impact on the Water Pollution Control Revolving Fund (WPCRF), a component part of PENNVEST funding. Section 320(f)(2) of the Clean Water Act, which sets the requirement for implementation of the management plans, also states that funds authorized to be appropriate under Titles II and VI and Section 319 of the Act may be used to assist states with the implementation of the plans. The applicable requirements referred to are contained in Sections 602(b)(5) and 216 of the Act. These Sections limit the use of funds in a WPCRF to projects that ensure progress toward compliance with enforceable deadlines, goals, and requirements of the Act. Priority is established for projects for secondary treatment, more stringent treatment, infiltration/inflow correction, major sewer system rehabilitation, new collector sewers and appurtenances, and combined sewer overflows. Projects that meet the above description and are within the Delaware Estuary can receive funds under PENNVEST if the project is included in Pennsylvania's Intended Use Plan. After the enforceable needs have been met, funds can be used for implementation of the Delaware Estuary Comprehensive Management Plan.

While attaining compliance with all the enforceable requirements of the Act will be a long-term project, the Delaware Estuary Comprehensive Management Plan will also identify projects that currently may be eligible for PENNVEST assistance now (priority list projects) in addition to future projects that may be funded from the WPCRF after all the statewide needs have been met.

2.4.3.4 Sewage Treatment Plant and Operators' Certification Act

The Sewage Treatment Plant and Operators' Certification Act of 1968 (as amended) creates a state board for the examination and certification of treatment facilities and sewage treatment plant operators. The Act requires that certified operators be responsible for the operation of treatment plants and distribution systems. A classification system is used in the certification of operators for specific types of treatment facilities.

2.4.3.5 Municipal Authorities Act

The Municipal Authorities Act of 1945 (as amended) allows for the incorporation of an authority by a particular municipality or group of municipalities. The Act prescribes the rights, powers, and duties of authorities and empowers them to acquire, construct, improve, maintain, and operate projects (such as wastewater facilities) and fix charges to the users in the area served by projects. In addition, authorities may borrow money and issue bonds for projects. The Act also prescribes the rights of bondholders, confers the right of eminent domain on authorities, and allows authorities to enter into contracts with and accept grants from the federal government.

2.4.3.6 Borough Code, First Class Township Code and Second Class Township Code

The Borough Code (P.L. 581, February 1, 1966, as amended), the First Class Township Code (P.L. 1206, June 24, 1931, as amended), and the Second Class Township Code (P.L. 103, May 1, 1933, as amended) allow municipalities such as those tributary to the City of Philadelphia to construct or acquire wastewater systems, contract with other municipalities to form a joint system, or connect into sewers of adjacent municipalities. The cost of municipal wastewater systems can be financed through municipal funds or the issuance of bonds. Municipalities may also appropriate or transfer monies to a municipal authority to be used for planning, constructing, improving, or replacing facilities. Property owners who benefit from wastewater facilities may be assessed for the cost of construction of the facility on a front-footage basis or proportional basis through charged connection fees and charged use fees for operation and maintenance of the facility.

These codes also allow municipalities to establish boards of health and/or health officer(s) who may enact and enforce rules and regulations deemed necessary for the preservation of public health. In Philadelphia, the City of Philadelphia Health Department, authorized through the County Code and the Local Health Administration Law, provides for the protection of public health. In the outlying areas, municipal codes allow for the creation of municipal boards of health or health officers who administer on-lot sewage disposal management programs, ensuring proper operation and maintenance of on-lot systems.

2.4.3.7 County Code

The County Code (P.L. 323, August 9, 1955, as amended) allows counties to appropriate monies to municipalities to aid in the construction and maintenance of wastewater facilities. In addition, counties may create a board of health to improve and protect public health.

2.4.4 County/City Regulations

In addition to federal, regional, and Commonwealth legislation governing wastewater treatment and disposal, the City of Philadelphia has established policies and enacted ordinances pertaining to wastewater flow management. The primary legislation determining City policies is the Home Rule Charter. In particular, the City revised the Water Department Regulations in 1990 to adopt Wastewater Control Regulations in response to the Clean Water Act and the General Pretreatment Regulations. The Industrial Pretreatment Plan (IPP), which includes an Enforcement Response Plan (ERP), was developed to regulate non-domestic discharges to the City wastewater conveyance and treatment systems.

2.4.4.1 Home Rule Charter

The Philadelphia Home Rule Charter was adopted in April 1951. Section 5-800 authorizes PWD to operate the City's water supply and the City's wastewater collection, treatment, and disposal systems. PWD is further charged with ensuring sound and safe operation of the City's wastewater treatment plants and collection system and is responsible for maintenance, repair, and improvement of the City's wastewater facilities. When authorized by the City Council, the PWD shall acquire, design, and construct additional sewage facilities as needed to fulfill these charges.

The Charter grants PWD the authority to fix and regulate rates for wastewater disposal services so as to yield at least an amount equal to operating expenses and interest and sinking fund charges on any debt incurred, or about to be incurred, for wastewater disposal services. When authorized by the City Council, PWD may contract to supply the services of City water and wastewater facilities to users outside the City limits.

A provision in the Charter grants City Council the power to create an authority or contract with a private operator to supply the above services to the City and to abolish the PWD. This transfer of responsibility to an authority or private owner is allowable if such course of action would be an advantage to the City and beneficial to its citizens.

2.4.4.2 Wastewater Control Regulations

The PWD has adopted Wastewater Control Regulations to meet the Home Rule Charter mandate, as well as the Clean Water Act requirement, that the City prevent the introduction of pollutants into the City's wastewater system. These regulations apply to all contributors to the wastewater collection and treatment system and ensure compliance with all applicable federal and state laws. These regulations provide for the issuance of permits to certain non-domestic and industrial users and enforcement of general requirements for other users; authorize monitoring and enforcement activities; and require user reporting and compliance schedule submissions. Further discussion of these regulations is contained in Section 4.4, and a copy is included in Appendix A.

2.4.4.3 Industrial Pretreatment Plan

As the owner and operator of three publicly owned treatment works (POTWs), the PWD has the primary responsibility for enforcing all federal pretreatment requirements as stipulated in the Clean Water Act, the City's Wastewater Control Regulations, and the City's NPDES permits. The Enforcement Response Plan (ERP) of the IPP was developed to meet this responsibility. The ERP establishes guidelines for identifying non-compliance, enforcement responses, calculation of fines, and compliance schedules. The ERP may be amended at any time and for any reason at the sole discretion of the PWD. A more detailed discussion of the ERP is included in Section 4.4.3.

2.5 PREVIOUS STUDIES AND PLANNING

2.5.1 Existing Facility Plans

2.5.1.1 Report on Design Studies, Northeast Water Pollution Control Plant, for the Philadelphia Water Department, March 1972

The "Report on Design Studies for the Northeast Water Pollution Control Plant" is one of three such reports prepared for the Philadelphia Water Department in 1972 and 1973. These reports discuss the basis for design and the evaluation of alternative systems for improvements to each of the three water pollution control plants (WPCPs) within Philadelphia. These improvements were proposed in response to more aggressive wastewater treatment requirements being implemented at the time by federal, regional, and state regulatory agencies that mandated secondary treatment of wastewater, to an expected increase in tributary size due to the planned regionalization of the southeast Pennsylvania wastewater collection and treatment systems, and to an expected increase of population within Philadelphia and the surrounding region.

This report includes a study of the Northeast WPCP's tributary area and contributing population at the time the report was written, and the projected increase in size of the area and population to the year 2020 based upon the extension of the tributary areas into surrounding counties and an increase in population. An evaluation of the wastewater flows and characteristics is described, projecting the amount and loadings of the wastewater flow to be handled in the year 2020. Furthermore, a description of the existing facilities at the Northeast WPCP is presented. These existing facilities treated wastewater through screening, grit chamber, primary sedimentation, and secondary treatment by means of the modified aeration activated sludge process. At the time the report was written, the WPCP's biosolids (sludge) were barged to sea and dumped in the ocean.

Based upon a comparison of the required level of treatment, expected wastewater flows, and loadings to the existing facilities, the needs of the Northeast WPCP were assessed, including resolving the primary problems at the plant related to the following:

- Air supply capabilities
- Final tank solids withdrawal and return capabilities
- Separation of flow from separate interceptors with different industrial-strength wastewater

Several alternative systems were considered to meet the expanded needs at the WPCP including:

1. Conventional activated sludge
2. Step aeration
3. Contact stabilization
4. The Kraus Process
5. The complete mix activated sludge
6. The Unox Process

Following the evaluation of the above processes, a detailed description of proposed facilities is presented. The selected plan includes the expansion of plant capacity from 100 mgd to 250 mgd and an arrangement for full-activated sludge treatment with pure oxygen aeration based on the Unox Process. Furthermore, it is noted that the Philadelphia Water Department to continue to research alternative biosolids management methods, since biosolids disposal at sea might not be an indefinitely viable alternative. Preliminary outline plans are presented to be phased into three stages of construction at a total cost of $71,600,000 (1972 dollars).

2.5.1.2 Report on Design Studies, Southwest Water Pollution Control Plant, for the Philadelphia Water Department, October 1972

The "Report on Design Studies for the Southwest Water Pollution Control Plant" is the second study prepared for the PWD. It presents the basis for design and the evaluation of alternative systems for improvements to each of the three Philadelphia WPCPs. Similar to the Northeast Water Pollution Control Plant improvements, the improvements proposed for the Southwest WPCP are in response to the increase in wastewater treatment requirements evolving at the time, which mandated secondary treatment of wastewater and regionalization of the wastewater collection and treatment systems.

Included in the Southwest Report are many of the tabulations and projections of population and wastewater flows that were developed in the Northeast WPCP Report. The Southwest Report also discusses plans by the Delaware Valley Regional Planning Commission (DVRPC) to regionalize the wastewater systems and possibly eliminate five wastewater treatment plants in counties surrounding Philadelphia. The tributary areas of these five plants would then be routed to the three Philadelphia Water Pollution Control Plants. The population projections on which the expansion and improvements to the Southwest WPCP are based (to the year 2020) accommodate this regionalization plan. Again, following the format established in the Report on Design Studies for the Northeast WPCP, the Southwest Report uses these tributary and population projections to develop wastewater flows and loading projections to the year 2020. Furthermore, a description of the existing facilities is presented. At the time this report was written, wastewater was treated at the Southwest WPCP through a primary treatment process including removal and grinding of

screenings, grit removal, flocculation, and sedimentation. Biosolids (sludge) from the Southwest and Southeast Plants was treated at the Southwest WPCP through a process including concentration tanks, heaters, digestion tanks, and lagoons. The digested biosolids were barged and dispersed at sea.

Through consideration of the existing facilities and the anticipated flows and loadings to be handled in the future, the report includes an evaluation of the needs at the Southwest WPCP. It noted that the required ultimate capacity of the Southwest WPCP was dependent on an accurate estimation of the actual regionalization that would occur under the DVRPC plan. A moderate estimate of growth and regionalization was chosen to raise the capacity of the Southwest WPCP from 136 mgd to 210 mgd. Full regionalization and healthy growth of the population would have ultimately resulted in a capacity of 515 mgd at the Southwest WPCP. The report contends that several modifications to the activated sludge process were considered to provide adequate treatment for the anticipated flows; however, the evaluation concentrated on the Unox Process in which pure oxygen is used in the aeration process. This evaluation included a pilot plant study of the Unox Process; a report on this pilot study is appended to the Southwest Report. Consideration was given to additional sludge treatment facilities including the two processes listed below. However, it was determined that the existing biosolids disposal facilities were adequate through 1990.

- Anaerobic digestion of primary and waste-activated sludge
- Anaerobic digestion of primary sludge and aerobic digestion of waste activated sludge

The report goes on to make a recommendation of facilities to meet the future demands (210 mgd) at the Southwest WPCP based on the Unox Process. Construction cost estimates and preliminary outline plans conclude the report.

2.5.1.3 Report on Design Studies, Southeast Water Pollution Control Plant, for the Philadelphia Water Department, January 1973

The "Report on Design Studies, Southeast Water Pollution Control Plant" prepared for the PWD is the final of the three design reports commissioned to evaluate the needs, alternatives, and design of improvements at the three water pollution control plants. The Southeast Report follows the format and basic content of the previous two reports with the same goal of meeting more stringent wastewater treatment parameters for a population expected through the year 2020. The Southeast WPCP and its service area are sandwiched between the Northeast and Southwest WPCPs and their respective service areas. The service area is well-defined and is not expected to experience any growth during any proposed regionalization. Therefore, it predicts a minimal expected increase in wastewater flows.

The population and wastewater projections that were presented in the Northeast Report are reprinted in the Southeast Report; however, the discussion on regionalization is minimal, because the increase in wastewater flows is expected to be slight. The flow to the Southeast WPCP at the

time the report was written was 136 mgd, and the expected 1990 flow was only 140 mgd. The primary improvements considered are in response to meeting higher quality effluent requirements, as detailed in the previous reports. A description of the existing facilities is presented. This facility provided primary treatment through the removal and grinding of screenings, grit removal, flocculation, and sedimentation before discharging into the Delaware River. As noted in the Southwest Report, the pumping station pumps the Southeast WPCP's sludge to the Southwest WPCP for further treatment and eventual dispersal at sea.

Because only a minimal increase in plant capacity was expected, the improvements to the Southeast WPCP were considered in response to the need to provide secondary treatment. Several systems were evaluated to determine the most effective secondary treatment process that would meet the additional treatment standards. The following systems were considered:

1. Physical-chemical treatment pilot study in accordance with the Z-M Process
2. Activated sludge study using air aeration
3. Activated sludge study using oxygen aeration (Unox Process)

Although both the activated sludge processes using air and oxygen met the required standards for treatment, the oxygen aeration system provided more consistent results. Therefore, the improvements at the Southeast WPCP were designed using the Unox Process for secondary treatment using oxygen aeration.

The report notes that the dispersal of digested biosolids at sea might not be a viable disposal option in the future and considers several alternative biosolids management options to be added to the Southeast WPCP facilities. The conclusion of these considerations is the recommendation to employ heat treatment for the conditioning of combined primary and thickened waste-activated sludge, followed by vacuum filtration and incineration at the Southeast WPCP. It is also noted that a final proposal and decision on the disposal of the biosolids is contingent upon several studies which were still underway at the time. The report concludes with a description of proposed facilities and processes, construction cost estimates, and preliminary outline plans.

2.5.1.4 Revisions to the Wastewater Flow and Strength Projections for the Northeast and Southwest Water Pollution Control Plants, for the Philadelphia Water Department

In the early 1980s, the PWD reassessed the flow and wastewater strength projections for the Northeast and Southwest Water Pollution Control Plants. The Reports on Design Studies, published in 1972 and 1973, projected greater population growth than that reported in the 1980 census. (See Plant Project Reports above.) This current data was used within the Capital Improvement Plan in determining the impact of reduced population on the process elements that were not yet under construction in 1983, when the revised report on wastewater flow and strength projections was submitted. Of the four remaining process elements considered for the Northeast WPCP, two were in the wastewater treatment train and two in the biosolids train. The modifications to the treatment processes in the wastewater train were to the existing primary and final sedimentation tanks. The remaining biosolids processing elements were modifications to the existing sludge digestion facility and a new biosolids dewatering facility. Consideration was given

to alternatives that ranged from complete remodeling of the units to abandonment. Since the biosolids dewatering facility was to be new construction, it could be sized for revised flow and biosolids projections.

This revised report concluded that $4.3 million dollars could be saved at the Northeast WPCP if the following revisions were implemented:

- Plant flow - 210 mgd
- Wastewater strength
  - BOD_5 - 200 mg/l
  - SS - 270 mg/l
- Meter vaults and connecting sewers - Phase II
  - Utilize existing conduit
- Existing primary sedimentation tanks
  - Modify all existing tanks
- Existing final sedimentation tanks
  - Modify existing Tanks 1-4
  - Abandon Tanks A-D
- Existing digestion facility
  - Modify four existing tanks
  - Demolish remaining four tanks
- New biosolids dewatering facility
  - Construct new facility utilizing centrifuge equipment

Southwest WPCP recommended revisions included:

- Plant flow - 200- mgd
- Wastewater strength
  - BOD_5 - 117 mg/l
  - SS - 214 mg/l

- New biosolids dewatering facility

  - Construct new facility utilizing centrifuge equipment

2.5.1.5 Facility Plan, City of Philadelphia, Combined Sewer Overflow Control, Prepared for Philadelphia Water Department, Water Pollution Control Division, by Watermation, Inc., July 1976

The "Facility Plan for the Combined Sewer Overflow Control System" evaluated the existing system and, in light of the reasons enumerated below, made recommendations for the Philadelphia Water Department to implement a centralized computer control system that would monitor and manipulate the overflow regulators within the combined sewer system. This report and subsequent improvements were precipitated by the following issues:

1. Philadelphia's NPDES permit issued February 13, 1975, stated that the Combined Sewer overflow (CSO) points "serve as combined sewer reliefs necessitated by storm water entering the sewer system and exceeding the hydraulic capacity of the sewers and/or the treatment plant and are permitted to discharge only for such reason. There is at this time no specific effluent limitations on these discharges."

2. The net positive impact of the improvements to the three Water Pollution Control Plants provided by the addition of secondary treatment facilities would have been diminished due to dry weather and wet weather overflows.

3. Minimizing dry-weather overflows would facilitate achievement of the national goal to provide secondary treatment to all dry-weather wastewater flow.

4. Tidal inflow through the existing regulators would be reduced.

5. Water quality and public use of the surrounding rivers and streams would be enhanced.

At the time this report was written, there were 176 regulators within the Philadelphia Combined Sewer System. These regulators accounted for an estimated 15 percent of the total waste loadings, dry and wet weather, discharged by the Philadelphia wastewater system. Furthermore, it was noted that 88 regulators were tidally affected and problems at some sites contributed an estimated 3 percent of the average daily flow to the Philadelphia wastewater system through inflow. These regulators were occasionally blocked or malfunctioning and required further action. The impact of the regulators and their dry- and wet-weather overflow was expected to be exacerbated by the proposed expansions and improvements at the three wastewater treatment plants to provide secondary treatment. With secondary treatment resulting in a significant increase in pollutant uptake, it was estimated that the proportion of wastewater effluent loadings

from the overflow of the combined sewers would increase to 30 percent of the total wasteload of the wastewater system.

The Facility Plan included a cost/benefit analysis and seven alternatives to meet the goals stated above:

1. Continuation of Present Activities (No Action)

2. Sewer Separation

3. Operational Control of the Existing System
   a) Manual Methods
   b) Manual Methods plus Monitoring
   c) Automated Control and Monitoring

4. Storage and Subsequent Treatment

5. Direct Treatment of Overflows

6. Dual use of Treatment Facilities

7. Combinations of the Above

The automated control and monitoring system was chosen as the most cost-effective method available to meet the intended result and was evaluated at length in the text of the report.

The recommendation of the Facility Plan includes a plan to consolidate the number of regulators from 176 to a more reasonable number. Measuring devices would be set up in each remaining regulator to monitor rainfall, tide depth, combined and interceptor sewer levels. New gate control devices, such as oil hydraulic cylinders or new float control devices, would be installed in each regulator to permit automatic operation by the regulator control center computer in response to systemwide monitoring data. This system would also give the operator the capability of storing flows within the trunk sewers, thus maximizing system storage. It was expected that the remote monitoring system would also optimize the maintenance efforts of the PWD staff by allowing the dispatching of maintenance crews to problem sites more effectively.

The CSO program discussed above was later modified and implemented in the Northeast Drainage District as a result of the 1978 Consent Decree between the City and the EPA.

The Facility Plan includes a schedule to have the system installed and operable within six years. However, the Facility Plan was developed with research conducted almost 20 years ago. As a result, the PWD does not believe it necessarily reflects current conditions within the CSO system.

Since 1982 almost $1.0 million has been spent on the rehabilitation of the regulators and tide gates. During the same period of time, the PWD has increased its emphasis on day-to-day operation and maintenance activities.

2.5.1.6 201 Facility Plan for Sludge Management - Final Report, for the Philadelphia Water Department, by Greeley & Hansen Engineers, June 1984

The "201 Facility Plan for Sludge Management" was precipitated by the need for an effective biosolids management system that would replace ocean dispersal, which had been terminated in 1980. Furthermore, a new biosolids management system was needed to treat and dispose of an expected increase in biosolids load due to the improved wastewater treatment processes that had been installed at the Philadelphia WPCPs in response to more stringent regional water quality standards. When completed, the improved treatment processes were expected to generate 465 dry tons of sludge per day.

This report includes an evaluation of 10 alternative systems for biosolids management and utilization, including two separate methods of biosolids dewatering and five basic biosolids processing technologies:

- Composting
- Incineration
- Co-incineration with solid waste in a watergrate furnace
- Co-incineration with solid waste in a residue fusion process (Ecorock)
- Landfilling

The evaluation of the alternatives included cost and environmental considerations, a value engineering workshop, and consideration of public comment which was solicited during the review process. The selected plan includes the following provisions:

1. Sludge from the Southeast WPCP would continue to be pumped via an existing pipeline to the Southwest WPCP where it would be mixed with the Southwest WPCP sludge and anaerobically digested. Sludge at the Northeast WPCP would be anaerobically digested and thickened before being barged to the Southwest WPCP to receive further treatment.

2. The digested biosolids from the three water pollution control plants would be dewatered to a solids concentration of 20 percent in centrifuges and composted at a centralized facility at the Southwest WPCP. The dewatered biosolids would be mixed with wood chips and piled for a period of 21 days where drawn air and heat would produce an aerobic digestion process to eliminate any remaining pathogens. Afterwards, the mixture would be cured before wood chip removal and preparation of the biosolids for a variety of utilizations.

At the time the plan was written, the biosolids utilization efforts were expected to meet the following demands:

Marketing as a commercial soil conditioner	50 percent
Application to local programs within Philadelphia	20 percent - 40 percent
Strip mine reclamation throughout Pennsylvania	10 percent - 30 percent

The report also contends that additional utilization techniques would be developed because the above uses would be stabilized or diminished as the program progressed.

It was estimated that the proposed systems would cost a total of $225,000,000. The plan would be financed through EPA construction grants and an increased charge to Philadelphia's customers of approximately $37.00 per year.

An environmental assessment of the plan concluded that no significant adverse impacts would result from its implementation.

2.5.2 Sewer System Evaluation Survey (SSES) Reports

Public Law 92-500 required that excessive infiltration and inflow be identified and eliminated from wastewater systems that are seeking federal funding for improvements to the collection and treatment facilities. This law seeks to ensure that public monies are most effectively spent by eliminating extraneous flow from the system which would otherwise increase the amount of treatment capacity, capital, and operating expenditures. In pursuit of federal funding for the planned upgrades of the three water pollution control plants from primary to secondary treatment and expanded capacity, the Philadelphia Water Department undertook an infiltration and inflow (I/I) study titled "Infiltration/Inflow Analysis, Philadelphia Sewer System," dated February 5, 1975. This study indicated the presence of infiltration and inflow in each of the three wastewater service areas within Philadelphia and led to three subsequent sewer system evaluation surveys (SSESs). Each of the three service areas were extensively studied by separate consulting engineering firms over the next five years in order to identify the sources of excessive I/I PADER subsequently concurred with the PWD in its determination that elimination or reduction of infiltration and inflow was not cost-effective.

2.5.2.1 Sewer System Evaluation Survey, Northeast Drainage District, City of Philadelphia, December 1981

The SSES of the Northeast Drainage District included the following tasks:

- Flow monitoring to identify areas with possible excessive infiltration

- Physical survey to identify manholes and line segments with possible excessive infiltration
- Rainfall simulation to identify inflow sources in the separated sewer system
- Internal inspection of the sewers to identify infiltration sources
- Sewer system evaluation report to determine the excessive I/I sources and to develop a rehabilitation program

The flow monitoring efforts quantified an estimated 74.6 million gallons per day (mgd) of annual average infiltration (32.3 mgd considered excessive), 294 million gallons per year (mgy) of annual inflow (122 mgy considered excessive), and 5.5 mgd of tidal inflow from 15 regulating chambers (4.4 mgd considered excessive). The physical survey included the inspection of 3,700 manholes and recommended the internal inspection 282,000 linear feet of sewer line. The rainfall simulation identified 2,243 sources of inflow with an estimated annual flow of 118 mgy. Over 197,000 feet of sewer were inspected as a follow-up to the manhole inspection. The final report recommended improvements to the collection system that would result in the removal of approximately 8 mgd of infiltration and 100 mgy of inflow at an expected cost of $2.1 million, of which $1.86 million would be funded through federal grants (1981 dollars).

This study identified leakage from the water distribution system into the wastewater collection system as a source of infiltration. Furthermore, this report recommends additional study of leakage in the water distribution system and a permanent wastewater monitoring system to track the effectiveness of the recommended rehabilitation program.

2.5.2.2 Sewer System Evaluation Survey, Southeast Drainage District, City of Philadelphia, August 1981

The approach to the SSES in the Southeast Drainage District was performed in two steps:

1. Flow monitoring to identify areas with possibly excessive infiltration
2. Detailed investigation 1) to identify line segments and point sources with excessive infiltration, and 2) to develop a program for rehabilitation of the sources involved.

Flow monitoring concluded that the collection system in the Southeast service area was subject to an estimated 67.5 mgd of total infiltration and 11.2 mgd of exfiltration. Of the infiltration, an estimated 57.0 mgd was attributable to non-point sources (37.0 mgd considered excessive) and 10.5 mgd due to tidal and pump station foundation infiltration (10.0 mgd considered excessive). The study went on to recommend a rehabilitation program to eliminate the excessive infiltration at a cost of $1.9 million with an expected savings of $2.9 million over twenty years.

This study also identified leakage from the water distribution system, which accounts for a large portion (estimated at 80 percent) of the infiltration in the collection system. Additional study of the water system leakage was not authorized under this SSES.

2.5.2.3 Sewer System Evaluation Survey, Phase II Evaluation of Sewer Infiltration/Inflow, Southwest Drainage District, City of Philadelphia, June 1983

The Southwest Drainage District was evaluated for I/I through a six-stage process:

- Finalization of the plan of action
- Initial evaluations and system flow monitoring
- Physical survey
- Rainfall simulation (separate sewer system only)
- Preparatory sewer cleaning and internal inspections
- Economic analysis and final report

The evaluation of the collection system included an analysis of the water use records, groundwater monitoring, the inspection of 4,800 manholes and 47,000 feet of sewer line, and the televising of 59,000 feet of sewer line. These efforts resulted in the identification of an estimated 4.9 mgd of infiltration (4.5 mgd excessive) and 9.2 mgd of inflow (7.1 mgd excessive). The report recommends a rehabilitation program to remove the excessive I/I flows at a cost of $315,000 of which it was expected $275,000 would be funded through federal grants.

2.5.3 Land Use Planning and Zoning

The two primary guidance documents for growth and development in the City of Philadelphia are the Comprehensive Plan (1960) and the Zoning Code, (1962) as amended (Chapter 14 of the Philadelphia Code).

Since 1960, the City, in lieu of making one single revision to these documents or functional has chosen to develop district or functional area plans for certain neighborhoods. Plans for districts such as Roxborough - Manyunk, North Philadelphia, Center City, and West Philadelphia has been completed.

Systematic revisions to the City's Zoning Code have been ongoing since the 1970's as a cooperative effort between City Council and the City of Philadelphia Planning Commission. As an example, the Center City area went through zoning revisions about two years ago.

The City of Philadelphia Planning Commission has served for many years as the authority responsible for establishing comprehensive (land use) planning. As established by Act 537, the role and responsibility of the wastewater management agencies is to develop and implement plans for the handling of sewage in conformance with existing and proposed land use.

The following sections summarize development plans that were prepared by the Planning Commission for several regions of the City that exhibited a high potential for redevelopment in the 1980s.

In general, these development plans are not very specific in what will be done, but they identify the potential and some opportunities for growth. Refer to Figure 2.5-1, Land Use Planning Areas, for a delineation of the planning areas referenced in this section.

2.5.3.1 Eastwick Urban Renewal Plan Review, Philadelphia City Planning Commission, Completed April 1982, Adopted August 1982

This report details how this once semi-rural community is now an active area comprised of 10 different neighborhoods. The report expounds on the major accomplishments that had already been implemented at the time it was written:

1. The installation of almost 20 miles of new streets with water mains and sewers
2. More than 4,200 new housing units
3. Two new public schools
4. More than three dozen industrial and related buildings

The report also delineates the allowable land use of the Eastwick Area. According to the text, there were:

1. Nine hundred acres of land designated for residential and related uses

2. Seven hundred fifty acres of land designated or scheduled to be zoned for industrial, commercial, industrial-related, and airport-related commercial use

3. Eight hundred fifty acres of land designated for airport clear zone, streets, and I-95 right-of-way purpose

Finally, the report notes that while 1,600 acres of this land have been developed, 700 acres (30 percent of the redevelopment area) of land remain for potential development. At the time of writing, it was estimated that it would take at least 10 more years before the development project would be close to completion.

2.5.3.2 North Delaware Waterfront District Plan, Philadelphia City Planning Commission, 1982

This report details the existing and recommended land use of this heavily urbanized and predominantly industrial 3,400-acre area. The report states that there were 208 industrial firms in this district and 10,000 persons residing in the district. It also notes the following:

1. Industrial land use covers one-third of the district.

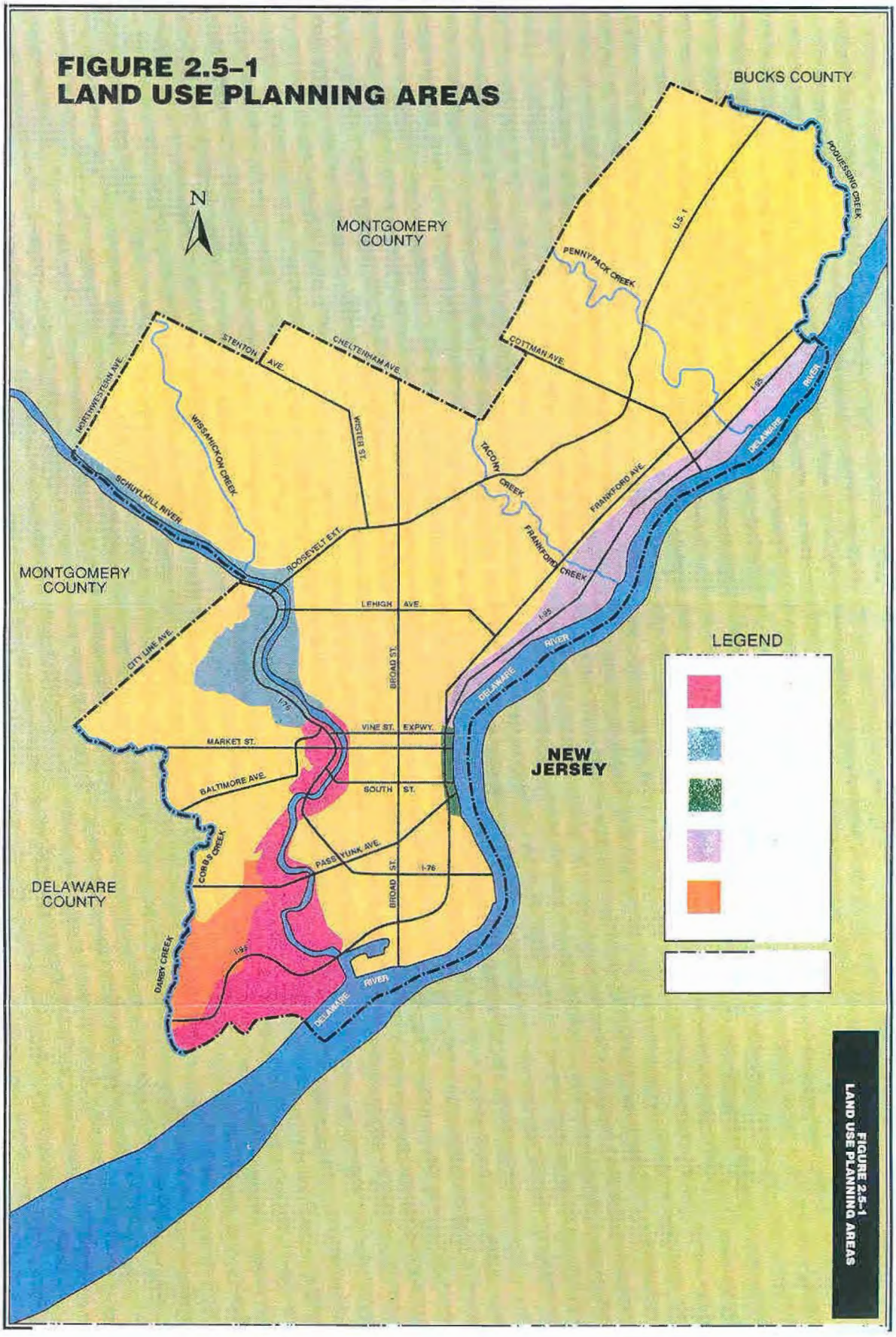
FIGURE 2.5–1
LAND USE PLANNING AREAS
BUCKS COUNTY
MONTGOMERY COUNTY
N
PENNYPACK CREEK
U.S. 1
POQUESSING CREEK
STENTON AVE.
CHELTENHAM AVE.
COTTMAN AVE.
NORTHWESTERN AVE.
WISSAHICKON CREEK
WISTER ST.
TACONY CREEK
I-95
DELAWARE RIVER
SCHUYLKILL RIVER
ROOSEVELT EXT.
FRANKFORD AVE.
FRANKFORD CREEK
MONTGOMERY COUNTY
LEHIGH AVE.
CITY LINE AVE.
BROAD ST.
I-76
VINE ST. EXPWY.
MARKET ST.
BALTIMORE AVE.
SOUTH ST.
NEW JERSEY
CORBS CREEK
PASSYUNK AVE.
DELAWARE COUNTY
DARBY CREEK
LEGEND
FIGURE 2.5-1
LAND USE PLANNING AREAS

2. Three hundred twenty-five acres of the district are zoned manufacturing/ commercial.

3. The district is almost fully developed with only one-tenth of the land classified as vacant.

The report recommends declaration of the following goals:

1. Maintain manufacturing employment and promote business expansion.
2. Attract new industrial and port-related development.
3. Promote new residential and commercial development.
4. Maintain and enhance existing residential communities.
5. Provide opportunities for the public to enjoy the special beauty of the waterfront.

The report does not include specific recommendations as to how to implement the above goals.

2.5.3.3 Central Riverfront District Plan, Philadelphia City Planning Commission, 1982

This report details the present and future conditions of this 200-acre area centered around Penn's Landing. The present conditions show that there were 30 acres of under-utilized railyards and obsolete piers, 24 acres used for public open space, and 40 acres of developable land area to the west.

The report states that at one time the Delaware and Schuylkill River waterfronts were almost entirely devoted to port and port-related uses. The report notes that a large portion of the waterfront remains as port uses; however, due to modern cargo handling technology, many of these facilities are obsolete and a significant amount of land used by supporting industries is no longer needed and is available for development. The report expounds that there are new opportunities for residential and commercial development within this district. It also states that full development of this area will result in the construction of approximately 5,000 to 6,000 housing units and the creation of a major new commercial and retail center. According to the report, these improvements were expected to take 10 to 15 years to complete.

2.5.3.4 Upper Schuylkill Waterfront District Plan, Philadelphia City Planning Commission, September 1984

This report details the existing and recommended land use of this 2,700 acre district. According to the report, there were 1,735 acres of recreational area, 500 acres for transportation, approximately 245 acres of vacant land, 116 acres of institutional lands, and 95 acres of manufacturing/commercial land. Furthermore, this district included 1,200 households, with a total of 3,461 persons.

The report recommended the declaration of the following goals:

1. Promote commercial and industrial revitalization and expansion to increase general employment and maintain current employment.

2. Attract new business consistent with developing the district to its full potential.

3. Maintain and enhance existing residential communities.

4. Provide more opportunities for the public to enjoy the special beauties of riverfront recreation.

5. Maintain and improve open space, and recreational and cultural resources.

The report did not detail specific recommendations to meet these goals.

2.5.3.5 The Future of Center City - Three Scenarios, Philadelphia City Planning Commission (no date noted)

This report presents three growth scenarios that discuss the demand for housing in Center City; it predicts that the surrounding (ring) neighborhoods will not experience a significant change. It expects that there will be an increased preference for urban living and, consequently, lower-scale infill housing in some areas will rise. According to this report, the Center City ring in 1980 had 26,000 households. Between the three scenarios, they project that Center City will experience an increase of between 600 and 8,000 new households, and the Center City ring will gain between 300 and 4,000 new households.

2.5.3.6 Lower Schuylkill Waterfront District Plan, Philadelphia City Planning Commission, 1983

This report states that this district contains 7,700 acres of land, including 330 acres of land zoned for residential and recreational use and 1,975 acres of land categorized as undeveloped land; two-thirds of the land is devoted to manufacturing, utilities, warehousing, the airport, rail rights-of-way, streets, and ports.

The report recommends the pursuit of the following goals:

1. Promote new residential development in Center City and West Philadelphia.

2. Enhance opportunities for public enjoyment of the Schuylkill and Delaware Rivers.

3. Maintain industrial employment and encourage business expansion.

4. Attract new business development.

The report does not offer specific recommendations on how to meet the above goals.

2.5.3.7 Zoning Remapping in Philadelphia, Philadelphia City Planning Commission, November 1984

This report details the zoning and remapping planned for Philadelphia and the reasons behind them. The report states that in 1983 there were 157 neighborhoods representing 60 percent of the City's land area. This referencing system has been replaced in 1989 by 165 neighborhoods with 54 zoning classifications: 31 residential, 10 commercial, and 9 industrial classifications, in addition to 4 special classifications. This report describes each of the classifications and where they are used.

2.5.4 Investing in Philadelphia - The 1991-1996 Capital Program, Philadelphia City Planning Commission (no date noted)

This report describes the appropriation and allocation of money for the improvement, development, and renewal of Philadelphia. According to the report, three of the investment areas for the capital program are Neighborhood Improvement, Economic Development, and Infrastructure Renewal, to which Philadelphia planned to allocate $1,049,000,000, $944,000,000, and $683,000,000, respectively, during this six-year period.

The report states that for the budget year under Neighborhood Improvement, $27,515,000 is appropriated for Recreation Facilities, $24,878,000 for housing and blight removal, and $2,666,000 for commercial centers. Furthermore, appropriations under Economic Development include $11,175,000 for industrial development, $3,729,000 for the Civic Center, and $1,500,000 for Penn's Landing. Finally, allocations under the Budget Year Infrastructure Renewal include $19,751,000 for recreation and cultural facilities, $6,381,000 for detention facilities, and $2,385,000 for sanitation.

2.5.5 Municipal Wasteload Management Reports (Chapter 94), City of Philadelphia, for the Pennsylvania Department of Environmental Resources, 1987-1991

The Municipal Wasteload Management Reports are prepared annually for the Pennsylvania Department of Environmental Resources (PADER) by the Philadelphia Water Department (PWD) in response to the requirements of Chapter 94 of the Rules and Regulations of the Department. Chapter 94 requires owners and operators of sewage facilities to properly manage their wasteloads. The goals are to prevent overloading of sewage facilities, limit additional connections to overloaded sewage systems, and improve opportunities to reclaim and recycle wastewater and sludge. The Municipal Wasteload Management Reports are required by PADER to monitor Chapter 94 requirements. Each report includes the following annual data:

- Pumping Station Capacity
- Outlying Municipality/Authority Flow
- Specific Plant Measurements for Flow and Organic Loading
- Organic Loading Graphs

- Hydraulic Loading Graphs
- Collector System
- Sewer Maintenance
- Industrial Pretreatment Program

Municipal Wasteload Management Reports for 1987 through 1991 have been reviewed and are referenced in Sections 4.2, 4.3, and 4.4 of this report.

2.5.6 COWAMP/208 Water Quality Management Plan for Southeastern Pennsylvania, Prepared for the Delaware Valley Regional Planning Commission and Pennsylvania Department of Environmental Resources, by Chester-Betz Engineers, April 1978

As required by the Clean Water Act of 1977, the "COWAMP/208 Water Quality Management Plan for Southeastern Pennsylvania" was prepared for the DVRPC and PADER by Chester-Betz Engineers to help maintain "clean water" in Southeastern Pennsylvania while also taking into consideration the present and future needs of the citizens of the region. The Comprehensive Water Quality Management Plan/208 (COWAMP/208) began in Southeastern Pennsylvania in 1974 as a regional water quality management program funded by the EPA and PADER. COWAMP/208 aims to develop a regional waste treatment management plan to protect surface and groundwater from pollution. The contents of the "COWAMP/208 Water Quality Management Plan for Southeastern Pennsylvania" include:

- Description of the Planing Framework
- Description of the Study Area
- Water Quality Assessment
- Discussion on Pollution Control: Problems, Policies, and Programs
- The Recommended Plan
- Public Participation
- Environmental Assessment Statement

2.5.7 Pennsylvania State Water Plan, SWP-4, Sub-basin 3, Lower Delaware River, Prepared By Office of Resources Management, Bureau of Water Resources Management, Pennsylvania Department of Environmental Resources, July 1983

The State Water Plan (SWP) provides a comprehensive evaluation of the State's water resources in the early 1980s, projects the condition of the water resources using concurrent trends, and provides recommendations to ensure proper management of the Commonwealth's water resources. The plan is evaluated at a regional level, and in this case, the region under consideration is the Lower Delaware River Basin. The primary waterways within this area are the Schuylkill River and the Lower Delaware River, which supply water to some or all of Philadelphia, Delaware, Chester, Montgomery, Berks, Schuylkill, Carbon, Lehigh, Bucks, Lancaster, and Lebanon Counties.

The SWP concentrates upon 1) the uses of the water resources in the Lower Delaware River Basin including domestic, economic, and recreational, and 2) how these uses impact the continued presence of adequate, high-quality water within the region. The SWP details the condition of both surface water and groundwater and projects future conditions based upon existing trends. The Plan contends that the existing trends are not acceptable or sufficient to guarantee an adequate quality water resource for the future. The report goes on to recommend that "decision makers" utilize this plan in concurrent and future processes to promote responsible resource management while maintaining consistency on a regional basis.

The SWP concentrates upon water supply and utility management and offers these five basic water supply recommendations.

1. Conservation
2. Water metering
3. Purchase of water from suppliers with excess capacity
4. Reduction of leakage
5. Regularization of the water supply

Although the SWP does consider water quality, it is not specific in its evaluation or recommendations for the Philadelphia wastewater collection or treatment systems. The SWP does note that the Philadelphia water and Philadelphia wastewater distribution and disposal systems direct a significant amount of flow from the Lower Schuylkill River to the Lower Delaware River; however, a proposal to rectify this situation or an indication that this is a critical situation is not provided within the plan. The information and water quality analyses within the plan will prove helpful and will be utilized within the planning considerations of the Philadelphia Wastewater System.

3.0 ASSESSMENT OF CURRENT SITUATION

3.1 PHYSICAL DESCRIPTION OF PLANNING AREA

The following sections provide a description of the physical characteristics of the planning area for this report that are germane to our planning analyses. Physical parameters such as geology, soils, wetlands, and surface waters either have a direct impact or are directly impacted by the effectiveness of the wastewater systems. The evaluation of the wastewater systems and recommendations drawn from those analyses will relate to the descriptions provided here.

3.1.1 Regional Geology

The geology of the study area for the Act 537 Plan is pertinent to the potential impacts on groundwater quality. Furthermore, groundwater quality will affect surface water quality as it percolates into surface streams as base flow. These considerations can be of particular interest when considering on-lot disposal systems (OLDS) or land application disposal techniques.

Geologic factors such as rock type, inclination, intergranular spacing, faults, joints, folds, bedding planes, and solution channels define the characteristics of the storage, transmission, and utilization capacity of groundwater. The bedrock characteristics have an immediate and overriding impact on the quality of the natural groundwater. For example, the more soluble geology structures will allow more material and compounds to be dissolved in the groundwater. As the dissolution of the geology structures increases, the porosity of the rock and ultimately the flow rates of the groundwater also increase, thus inhibiting the natural purification benefits of filtration and assimilation.

There are three rock classifications that will be used in this section to describe the geologic characteristics of the planning area: igneous, metamorphic, and sedimentary. A brief description of these classifications is presented here for clarity of the following discussion.

Igneous Rock Classifications

Igneous rocks are classified on the basis of two features: mineral composition and the texture of the rock. The igneous rocks that can be found in this planning area include pegmatite, granite, and basalt.

- Pegmatite is a very coarse-grained, light-colored igneous rock. Individual crystals frequently exceed one inch in diameter. Quartz, feldspar, and mica can easily be seen.

- Granite is a coarse-grained, light-colored igneous rock composed of mineral quartz, feldspar, mica, and hornblende.

- Basalt is a fine-grained, dark-colored igneous rock. In this area, basaltic rocks are usually found cutting across metamorphic rocks as intrusive sills or dikes. Further metamorphosis can change this rock into Amphibolite or Amphibole gneiss.

Metamorphic Rock Classifications

Metamorphic rocks are formed when existing rock masses are subjected to intense pressures and/or high temperatures. The metamorphic rock types that are found in this area are schist, phyllite, slate, gneiss, and quartzite:

- Schist is a dark metamorphic rock made up of flaky crystals large enough to be seen by the naked eye.

- Slate has crystals that are too small to be seen with the naked eye, and it appears to be quite uniform in composition.

- Phyllite is another metamorphic rock with crystals the size between those of a schist and slate.

- Gneiss contains crystals even larger than those in a schist. In the gneiss, various minerals have become segregated into distinct bands.

- Quartzite is a very hard metamorphic rock resulting from a sedimentary bank composed primarily of quartz, that was subjected to metamorphic pressures and/or temperature.

In certain locations, a thick unit of the metamorphic rock quartzite chickies is exposed. Quartzite chickies is a very hard, chemically stable rock that is resistant to breakage. The quartzite unit is surrounded by softer and more easily weathered limestones, dolomites, and phyllites.

Sedimentary Rock Classifications

A sedimentary rock is one that has been formed by the sedimentation and compaction of material eroded from previously existing geologic formations. In this area, limestone and dolomite are predominant.

- Limestone is a chemically precipitated sedimentary rock made up of the mineral calcite (composed of calcium carbonate).

- Dolomite is a chemically precipitated sedimentary rock that is similar to limestone, but is dominated by dolomite (calcium magnesium carbonate) rather than calcite.

Most of Philadelphia lies within the Coastal Plain Physiographic Province with the northwest portion of the City and a small section of the northeast jutting into the Piedmont Uplands section of the Piedmont Province. The delineation of the Coastal Plain and Piedmont Physiographic Provinces, as well as the predominant geologic structures within the planning area can be seen on Figure 3.1-1, Regional Geology Map, and Table 3.1.1. The key to the Geologic Formations is shown on Figure 3.1-1.

Coastal Plain Province

The Coastal Plain Province of the Lower Delaware River is a rectangular-shaped strip bordering the Delaware River for approximately 32 miles with an average width of 2 miles. Elevations in the Coastal Plain range from less than 10 feet along the Delaware River to slightly more than 40 feet at the northwest edge of the Province. The origin and condition of the geologic structures within the Coastal Plain are controlled by the alluvial action in the Delaware River and Bay. The sediments distributed by these bodies of water have resulted in an undisturbed sequence of unconsolidated and semi-consolidated sands, clays, and gravels that range in age between the Cretaceous and Quaternary Periods. The sequence of unconsolidated formations in the Philadelphia area is in ascending order, the Raritan and Majority Formations (Cretaceous in age), followed by the Pensauken and Cape May Formations (Quaternary in age). The Cretaceous Formations are unexposed in the planning area but present in the shallow subsurface. These formations provide an important source of industrial groundwater for the Philadelphia metropolitan area. The thickness of the deposits increases in a southwesterly direction from 0 feet to 400 feet at the Delaware River.

These unconsolidated sediments cover an extension of the consolidated Piedmont basement complex, which is composed of schist and granite members of the Wissahickon Formation. The Piedmont basement is covered by a thin layer of residual clay resulting from the weathering of the parent material. Local streams have downcut through the sediments of the Pensauken Formation in many places and exposed the Wissahickon Formation.

The Pensauken and Cape May Formations of the Coastal Plain consist primarily of sand, gravel, and clay. These formations have a typical thickness of 30 to 40 feet in Bucks County and Philadelphia County and they completely cover the underlying Cretaceous sediment. Together with the underlying upper sand member of the Raritan Formation that often lies in direct contact, these sands form the most exclusive aquifer in the Philadelphia area.

Piedmont Providence

The Piedmont Uplands Section is the most southerly section in the Pennsylvania portion of the Piedmont Province. Here, the more resistant rocks of the Piedmont Uplands give way to the less resistant Coastal Plain sediments. A distinct drop in elevation occurs at this point from the Piedmont hill elevations of about 150 feet above mean sea level (msl) to about 40 feet (msl) at the Coastal Plain Section.

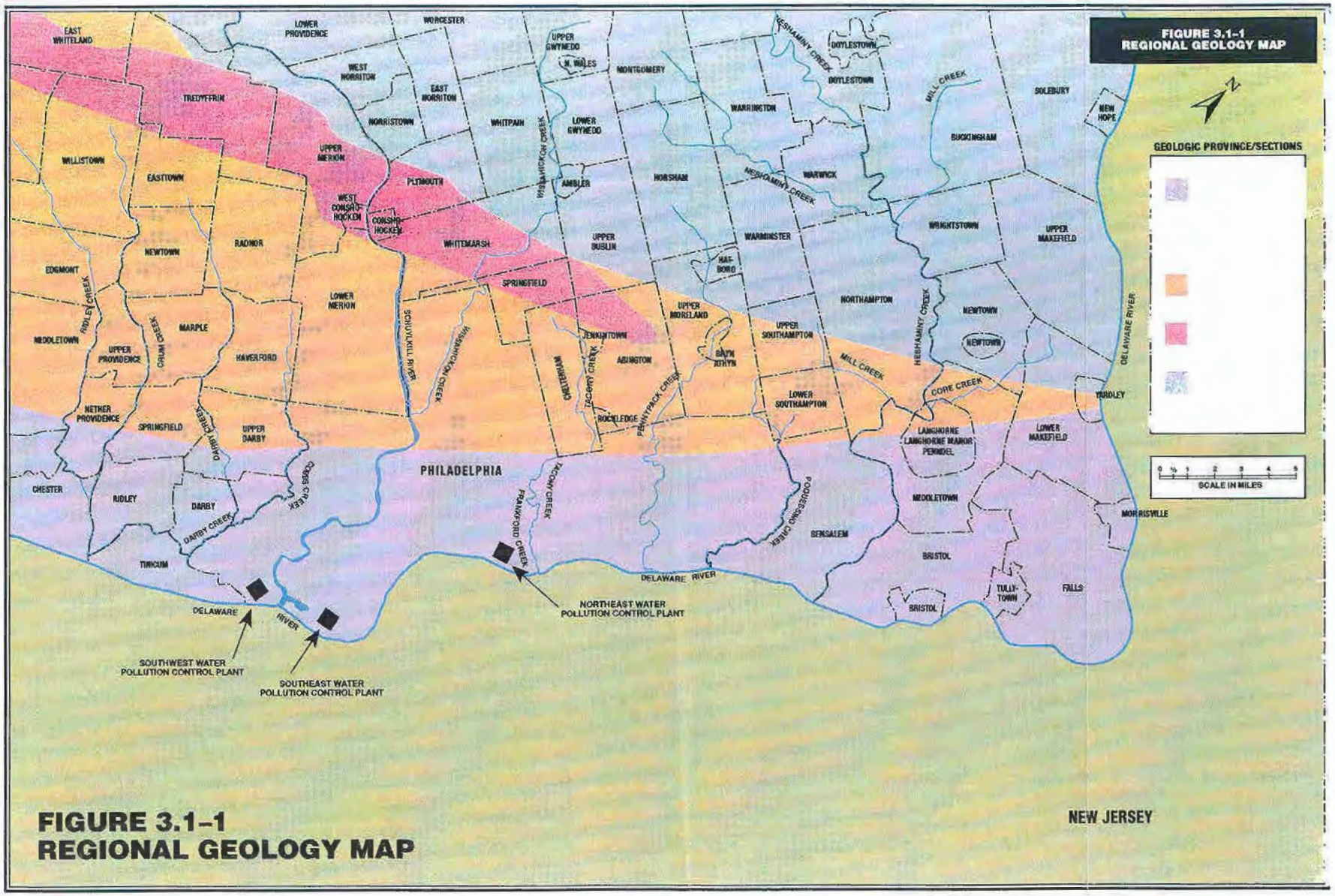

FIGURE 3.1-1
REGIONAL GEOLOGY MAP

BCM

TABLE 3.1.1

KEY TO GEOLOGIC FORMATIONS SHOWN IN FIGURE 3.1-1

Xs	**Probably Lower Paleozoic**	**Serpentinite**
	Includes serpentine, steatite, and associated products of alteration of peridotites and pyroxenites	
Xw	**Probably Lower Paleozoic** Oligoclase mica schist - Includes some hornholes gneiss members and some auger gneiss and quartz-rich and feldspar-rich members showing various degrees of granitization	**Wissahickon Formation**
Xhg	**Probably Lower Paleozoic** Includes rocks of probable 4-sedimentary origin; may be equivalent to Precambrian Hornblende gneiss	**Hornblende gneiss**
Xgr	**Probably Lower Paleozoic** Includes Springfield Granodiprite (granitite Wissahickon) and related rocks	**Granite gneiss and granite**
Qp	**Quaternary, Pleitocene** Sands and gravel with clay and silt at the base locally; includes areas of recent alluviation and swamp deposits	**Pensauken Formation**
Tpb?	**Triassic** Brunswick and Gettysburg - Red to brown, fine- to coarse-grained quartose sandstone with red shale interbeds; interbedded shale and limestone conglomerate and quartz pebble conglomerate	**Brunswick Formation or Gettysburg Formation**
Tbm	**Tertiary, Pliocene** High-level terrace deposits; sand and gravel with some silts	**Bryn Mawr Formation**
Qt		**Trenton gravel**
Kp	**Cretaceous** Highly colored clay with some sand	**Patapsco Formation**
Cch	**Cambrian** Chickies - Light gray, hard, massive, scolithus - bearing quartzite and quartz schist; interbedded dark slate at top; conglomerate at base.	**Chickies Formation**

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Principal streams draining the Piedmont Upland Section of the sub-basin are the Brandywine, Red Clay, White Clay, Crum, Ridley, Chester, Darby, and French Creeks. Other streams including the Pennypack and Wissahickon Creeks originate in the Triassic Lowland and flow through the Upland Section.

As mentioned above, portions of northeast and northwest Philadelphia extend into the Piedmont Uplands Section. This Piedmont Uplands Section then continues northward into the southern portions of Bucks and Montgomery Counties and extends westward through Chester, Lancaster, and York Counties.

The Piedmont Uplands is underlain by three predominant rock types: igneous and metamorphic crystalline rocks (mostly granite and gneiss); metamorphic sedimentary rocks (schist, phyllite, and quartzite); and slightly metamorphic carbonate rocks (limestone and dolomite). The rocks exposed in this physiographic section within Philadelphia are shown on Figure 3.1-1.

The oldest rocks within the Piedmont Uplands are the complex crystalline assemblages of Precambrian granite and gneiss. These are exposed along the folds axis as a result of internal structural deformation. In the southern part of Chester County and extending into the Philadelphia planning area, the granite-gneiss complex is known as Baltimore gneiss. The gneiss is believed to be similar to a gneiss exposed in Baltimore, Maryland, hence the name. Baltimore gneiss can be observed at many places in the Philadelphia area. It trends across Wissahickon Creek north of Bells Mill Road and can also be seen at a large quarry in Glen Mills.

It is thought that, originally, the rocks of Baltimore gneiss were largely igneous in origin with smaller portions of sedimentary origin. The highly metamorphosed gneiss is composed of alternating mineral bands. Individual bands may vary in thickness from less than one inch to several feet. In many places, the gneiss has been cut by igneous intrusions, which results in a formation that is extremely variable in character.

The Baltimore gneiss complex south of Chester Valley is overlain by the metamorphic rocks of the Glenurn series. The Glenurn series includes the Wissahickon Formation and isolated bodies of serpentinite, pegmatite, metagabbro, and metamorphosed granitic rocks. The Wissahickon Formation is the most extensive formation of all of the metamorphic rocks exposed in the Piedmont Uplands.

The outcrop belt of the Wissahickon Formation is bordered on the north by the sequence of Cambria and Ordovician quartzites and carbonates of the Chester Valley. From a structural standpoint, the rocks of the Piedmont Uplands are probably the most complex of any in the southeastern Pennsylvania. Detailed analysis of folds, faults, and other structures indicates that these formations have been subject to at least two very intensive deformations.

This complex structure, combined with generally poor outcrop exposures, makes the Piedmont one of the most poorly understood geologic areas in Pennsylvania. This section of the report relies heavily on the information presented in the State Water Plan.

3.1.2 Regional Soils

The general properties of soils help to determine their suitability for on-lot disposal and land disposal technologies. Poor soil suitability may result in these disposal systems polluting ground and surface waters, thus creating an unacceptable health hazard.

The soils of the Philadelphia Act 537 planning area have been delineated by a very broad interpretation of their hydrologic characteristics. This delineation is based upon Soil Associations, as can be seen on Figure 3.1-2, Regional Soils Map, and includes:

- C2a: Chester-Glenelg Association - Soils formed in materials from igneous and metamorphic rocks; includes substrate of schists, gneiss, porcelonite, metahyolite, and metabasalt.

- E3a: Howell-Fallsington Association - Soils formed in unconsolidated water alluvial materials.

The soils associated with the Piedmont Uplands Physiographic Section primarily have a B hydrologic rating and, therefore, moderate rates of infiltration can be expected. This section has slopes averaging from 15 to 20 percent and soil depths of 50 to 70 inches. Soils within the Coastal Plain Province along the Delaware River are influenced by their substrate of marine clay and sand and give rise to soils formed by unconsolidated alluvial deposits that exhibit slow rates of infiltration. It should also be noted that the dense population, development, and impervious coverage within the City of Philadelphia have a significant impact on the hydrology, runoff potential, and non-point pollution to the surrounding surface waters. The infiltration rates of the planning area are, therefore, generally very slow.

Soil Impact on On-Lot Disposal Systems

In the Philadelphia Act 537 planning area, the soils were delineated by using the Bucks and Philadelphia Counties Soil Surveys developed by the United States Department of Agriculture (USDA), Soil Conservation Service (SCS), in cooperation with the Pennsylvania Department of Environmental Resources, State Conservation Commission.

The specific exposed soil types have been delineated and evaluated for those areas where it has been determined that a high density of recognized on-lot disposal systems (OLDS) exists. These areas are further discussed under Section 4.1, On-Lot Disposal Systems. Figure 4.1-1 shows the areas within the City with the highest concentration of OLDS. Below is a description of each of these types of soils present in Philadelphia. Table 3.1.2 lists significant soil properties and their approximate acreage within Philadelphia.

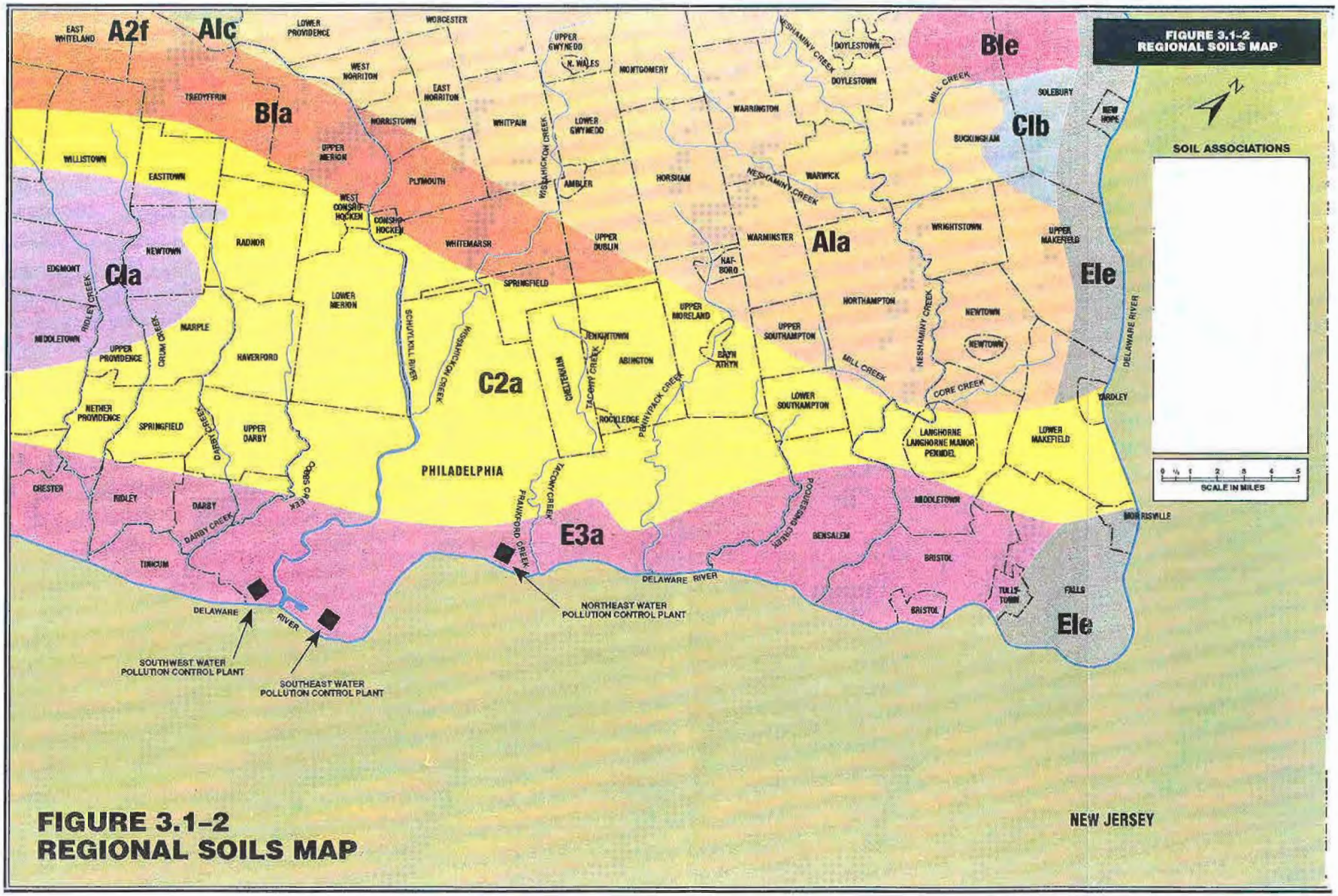

FIGURE 3.1–2
REGIONAL SOILS MAP

BCM

TABLE 3.1.2

APPROXIMATE ACREAGE AND SELECTED PROPERTIES OF SOILS WITHIN PHILADELPHIA

Soil	Depth to Bedrock (ft)	Map Symbol	Acreage	Permeability	PADER Soil Series	Suitability for On-Lot Sewage Disposal
Alluvial Land	Properties are too variable to estimate	Ae	150	Properties are too variable to estimate		Severe: subject to flooding
Chester silt loam, 3- to 8-percent slopes	5 to 10	CeB	925	0.63 - 2.00		Slight
Chester silt loam, 8- to 15-percent slopes	5 to 10	CeC	220	0.63 - 2.00		Moderate slope
Duncannon silt loam, 0- to 3-percent slopes	<4	DuA	605	0.63 - 2.00		Slight
Duncannon silt loam, 3- to 8-percent slopes	<4	DuB	265	0.63 - 2.00		Slight
Hatboro silt loam	5 to 10	Ha	720	0.63 - 2.00		Severe: seasonal high water table; flooding
Manor loam, 3- to 8-percent slopes	4 to 12	MaB	1,060	2.00 - 6.30		Slight: hazard of groundwater contamination
Manor loam, 8- to 15-percent slopes	4 to 12	MaC	1,170	2.00 - 6.30		Moderate: hazard of groundwater contamination; slope
Manor loam, 15- to 25-percent slopes	4 to 12	MaD	695	2.00 - 6.30		Severe: slope
Manor extremely stony loam, 8- to 25-percent slopes	4 to 12	MbD	740	2.00 - 6.30		Severe: stoniness; slope

BCM

TABLE 3.1.2 (Continued)

Soil	Depth to Bedrock (ft)	Map Symbol	Acreage	Permeability	PADER Soil Series	Suitability for On-Lot Sewage Disposal
Manor and Chester extremely stony loams, 25- to 50-percent slopes	4 to 12	McE	1,270	2.00 - 6.30		Severe: stoniness; slope
Marsh	Properties are too variable to estimate	Mh	505	Properties are too variable to estimate		Severe: high water table; flooding
Rowland silt loam	31/2 to 6	Ro	475	0.63 - 2.00		Severe: flooding
Urban land	Properties are too variable to estimate	Ub	43,315	Properties are too variable to estimate		Too variable to rate; requires onsite investigation
Urban land-Chester complex, 0 to 8 percent slopes	Properties are too variable to estimate	UdB	23,245	Properties are too variable to estimate		Slight
Urban land-Chester complex, 8 to 15 percent slopes	Properties are too variable to estimate	UdC	2,000	Properties are too variable to estimate		Moderate: slope
Urban land - Howell complex	Properties are too variable to estimate	Uh	4,155	Properties are too variable to estimate		Severe: moderately slow permeability
Water			175	N/A		N/A
Miscellaneous soils			550	N/A		N/A
TOTAL			**82,240**			

"Soil Survey of Bucks and Philadelphia Counties, Pennsylvania", USDA, Soil Conservation Service, July 1975.

Alluvial Land

Alluvial land usually lies within the floodplain of rivers, streams, and gullies. It consists of frequently flooded, somewhat poorly drained soils that formed in alluvium. These areas are commonly cut by shallow stream channels. They are very long and narrow and range from 5 to 25 acres in size. Most nonfarm land uses on this soil type are limited by flooding and wetness.

Chester Series

The Chester Series consists of deep, well-drained, nearly level to very steep soils on uplands. Those soils are on sides and tops of ridges. The areas are elongated or irregular in shape and 3 to 50 acres or more in size. They formed in loamy material weathered from gneiss and schist. The Chester silt loam with 3- to 8-percent slopes can be found on the sides and tips of ridges. This soil has good drainage and gentle slopes; therefore, it is usually good for most nonfarm uses. The Chester silt loam with 8- to 15-percent slopes can be found on the sides of ridges. The slope often limits most nonfarm uses of this soil.

Duncannon Series

The Duncannon series consists of deep, well-drained, nearly level to gently sloping soils on uplands. These soils are on upper elevations in areas of low relief. They are formed in silty, wind-deposited sediment that overlie shales, sandstone, and occasionally other material. The Duncannon silt loam with 0- to 3-percent slopes can be found in areas of low relief on broad uplands. Areas characterized with this soil series are often oval or elongated in shape and 3 to 25 acres in size. This soil has good drainage and nearly level slopes; therefore, it is only slightly limited for most nonfarm uses. The Duncannon silt loam with 3- to 8-percent slopes is also found in areas of low relief in broad uplands. These areas are elongated or irregular in shape and 3 to 20 acres or more in size.

Hatboro Series

The Hatboro series consists of deep, poorly drained, nearly level soils on floodplains. These soils are mainly along small meandering streams. They formed in loamy alluvium that washed from upland soils underlain by gneiss, schist, and diabase. The Hatboro silt loam with 0- to 3-percent slopes is usually found on smooth or slightly concave floodplains. Areas of this soil type are elongated and narrow and 3 to 50 acres or more in size. The hazards of flooding and a high water table limit most nonfarm uses of this soil.

Manor Series

The Manor Series consists of deep, well-drained, gently sloping to very steep soils on uplands. These soils are mainly found on side slopes and ridge tops. They are formed from loamy material of weathered schist and gneiss. The Manor loam with 3- to 8-percent slopes can be found on hilltops and ridgetops. Areas are oval or elongated and 3 to 10 acres or more in size. This soil has good drainage and gentle slopes; therefore, it is only slightly limited for most nonfarm uses.

The Manor loam with 8- to 15-percent slopes can be found on sides of ridges and hills. Areas are elongated in shape and 3 to 50 acres or more in size. Slope limits most nonfarm uses of this soil. The Manor loam with 15- to 25-percent slopes can be found on the sides of ridges and hills and adjacent to drainageways. Slope limits most nonfarm uses of this soil. The extremely stony Manor loam with 8- to 25-percent slopes can be found on sides of hills and ridges and on short slopes adjacent to narrow floodplains. Areas are elongated in shape and 5 to 75 acres or more in size. Slope and stoniness limit most nonfarm uses of this soil. The Manor and Chester Series have extremely stony loams with 25- to 50-percent slopes. The proportion of soils varies in individual areas. These soils are found mainly on ridges and short-side slopes adjacent to creek floodplains. Areas are elongated in shape and 5 to 100 acres or more in size. The slope and stoniness limit most nonfarm uses of these soils.

Marsh Series

The Marsh Series is often found along shorelines subject to ponding or tidal overflow, or in depressions where runoff collects. The soil material is variable, but it consists mostly of loamy to clayey marine and alluvial deposits. This soil is always very wet and conducive to the development of wetlands. Areas are irregular in shape and range from 5 to 100 acres or more in size. Most nonfarm uses are limited by flooding and wetness.

Rowland Series

The Rowland series consists of deep, moderately well-drained to somewhat poorly drained, nearly level soils on floodplains. These soils are found mainly along small meandering streams. They formed in loamy alluvium that washed from upland soils and are underlain by red and brown shale and sandstone. Flooding from the seasonal high water table and moderately slow permeability limit most nonfarm uses of this soil.

Urban Land

Urban land is the most widely found soil in the planning area and is commonly found in highly built-up areas of Philadelphia County. Most urban land is found on terraces of the Uplands and Coastal Plain; however, some can be found in the floodplain. The soils and foundation materials are highly variable. The use of urban land with 0-to 8-percent slopes to prepare an area for development precludes its use for most other purposes. The Urban Land - Chester complex with 0- to 8-percent slopes is about 60 percent urban land, 33 percent Chester soil, and 5 percent included soils. It is found in semibuilt-up areas, mainly in the gneiss and schist ridge and valley areas of Philadelphia County. Areas are irregular in shape and 5 to 2,500 acres or more in size. Drainage is good and slopes are nearly level to gentle; therefore, this complex is only slightly limited for most nonfarm use. Onsite investigation is needed, however, in open areas to determine the hazards and degree of limitation for specified uses. The Urban Land - Chester complex with 8- to 15-percent slopes is about 60 percent urban land, 35 percent Chester soils, and 5 percent included soils. It is in semibuilt-up areas, mainly in the gneiss and schist ridges and valleys of this County. Areas are irregular in shape and 5 to 500 acres in size. Slope limits most nonfarm uses. The Urban Land - Howell complex with 0- to 15-percent slopes is 60 percent urban land, 35

percent Howell silt loam, and 5 percent included soils. It is located in semibuilt-up areas on terraces of the Coastal Plain. Areas are irregular in shape and 5 to 3,000 acres or more in size. Slow permeability limits nonfarm uses of this complex.

3.1.3 Delineation of Wastewater Service Areas

The PWD maintains three large water pollution control plants (WPCPs) to provide wastewater treatment to the residents, industries, and institutions of the City of Philadelphia and 10 outlying municipalities. As can be seen on Figure 3.1-3, the City of Philadelphia, for the purposes of this report, has been subdivided into three subareas based on the service areas of each of these three WPCPs. The WPCPs are the most significant wastewater treatment facilities within the planning area, both in terms of capital investment and capability of influencing the quality of the receiving waters. Therefore, the WPCPs and their respective service areas are the natural subareas upon which to base evaluation of the facilities, capabilities, and future needs.

The regional service areas of each of the water pollution control plants are shown in Figure 3.1-4, 3.1-5 and 3.1-6.

3.1.4 Delineation of Sewered/Unsewered Areas

The City of Philadelphia has one of the oldest wastewater collection and treatment systems in the United States. It has been extensively developed since the turn of the century. It follows that a vast majority of the City area is serviced by sewers. There are some large open areas, such as Pennypack and Fairmount Parks among others, that are not serviced by sewers.

The Philadelphia Health Department estimates that 2,450 out of 674,900 residences, about 0.4 percent, continue to utilize on-lot disposal systems (OLDS) in very localized areas. The sewered/unsewered areas within the City are delineated on Figure 3.1-7. The evaluation of OLDS is provided in Section 4.1, On-Lot Disposal Systems.

Generally speaking, those areas that have the greatest density of OLDS are those majestic dwellings in and adjacent to the park and in the far reaching northeast and northwest areas of the city. The areas of OLDS concentrations that are adjacent to surface streams and in some sections of the Northeast are low-lying, with elevations below 200 feet. However, in the Chestnut Hill/Manayunk/Roxborough area, the elevations are somewhat higher, and in some cases, greater than 400 feet.

3.1.5 Surface Water Resources

There are two major rivers and six creeks that comprise the surface waters of the City of Philadelphia. There are also minor streams and tributaries below the streets of the City that have been incorporated into the present-day storm drain system. Early maps of the City indicate creeks like Chickhansink, Moyanokin, Kingsessing, Cohoquinock, Wischanemunk, Gunners Run, and the Dock, all of which no longer appear as surface water courses.

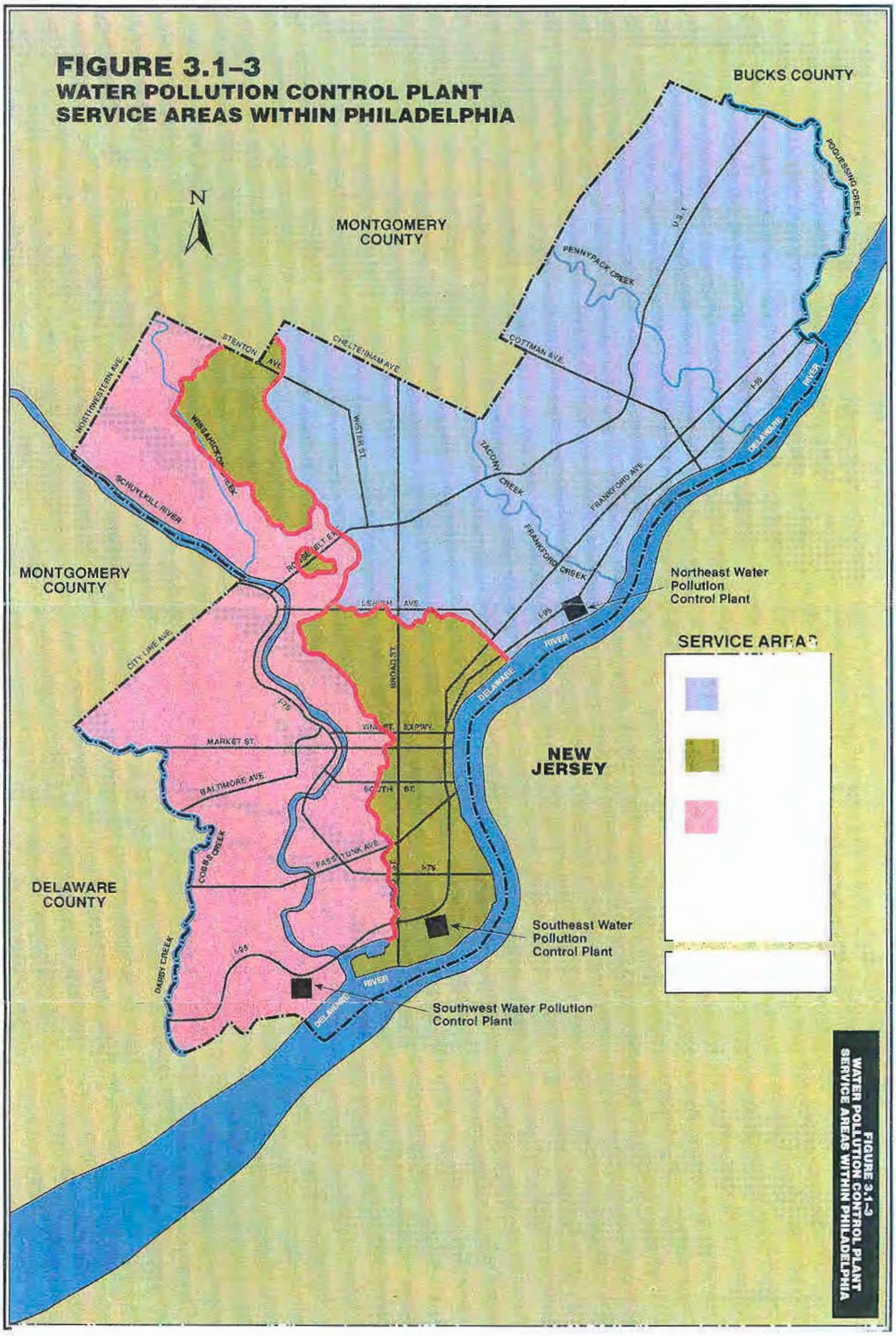
FIGURE 3.1–3
WATER POLLUTION CONTROL PLANT
SERVICE AREAS WITHIN PHILADELPHIA
BUCKS COUNTY
N
MONTGOMERY COUNTY
PENNYPACK CREEK
POQUESSING CREEK
U.S.Y
COTTMAN AVE.
CHELTENHAM AVE.
STENTON AVE.
NORTHWESTERN AVE.
WISSAHICKON CREEK
WISTER ST.
TACONY CREEK
FRANKFORD AVE.
FRANKFORD CREEK
I-95
DELAWARE RIVER
SCHUYLKILL RIVER
ROOSEVELT EXPY.
MONTGOMERY COUNTY
LEHIGH AVE.
CITY LINE AVE.
BROAD ST.
I-76
VINE ST. EXPWY.
MARKET ST.
BALTIMORE AVE.
SOUTH ST.
PASSYUNK AVE.
I-76
COBBS CREEK
DELAWARE COUNTY
DARBY CREEK
I-95
Northeast Water Pollution Control Plant
SERVICE AREAS
NEW JERSEY
Southeast Water Pollution Control Plant
Southwest Water Pollution Control Plant
FIGURE 3.1-3
WATER POLLUTION CONTROL PLANT
SERVICE AREAS WITHIN PHILADELPHIA

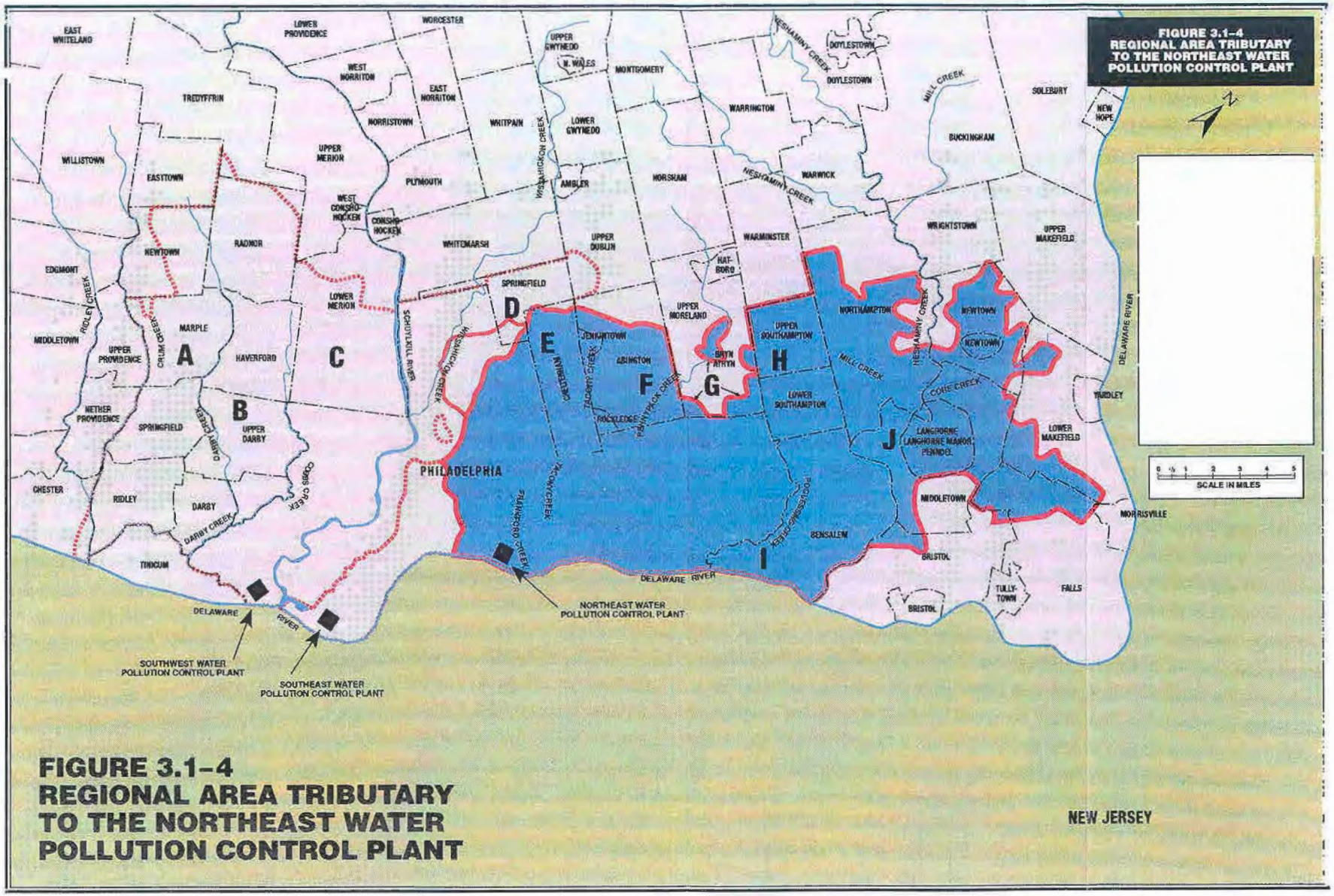

FIGURE 3.1-4
REGIONAL AREA TRIBUTARY TO THE NORTHEAST WATER POLLUTION CONTROL PLANT

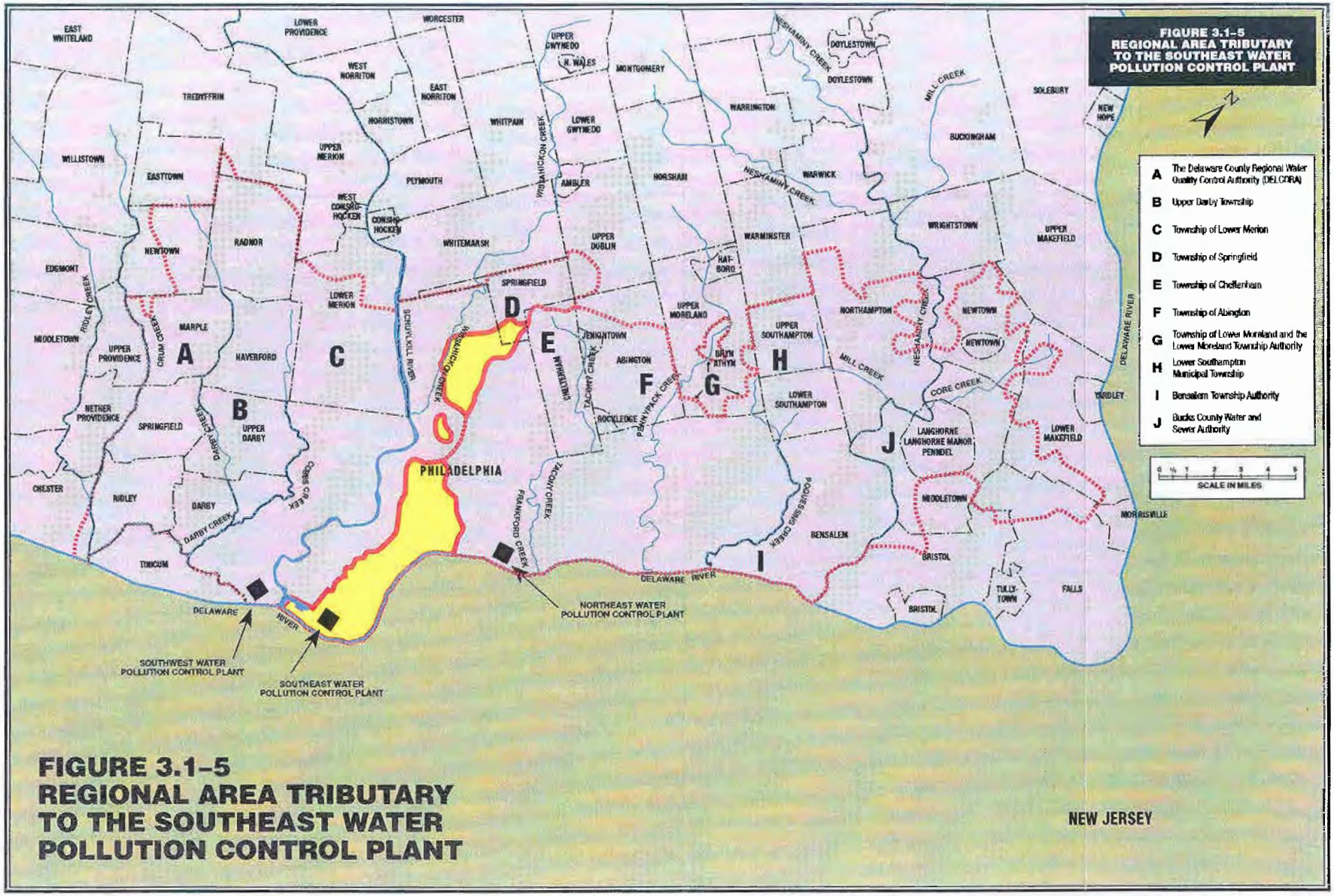

FIGURE 3.1-5
REGIONAL AREA TRIBUTARY
TO THE SOUTHEAST WATER
POLLUTION CONTROL PLANT

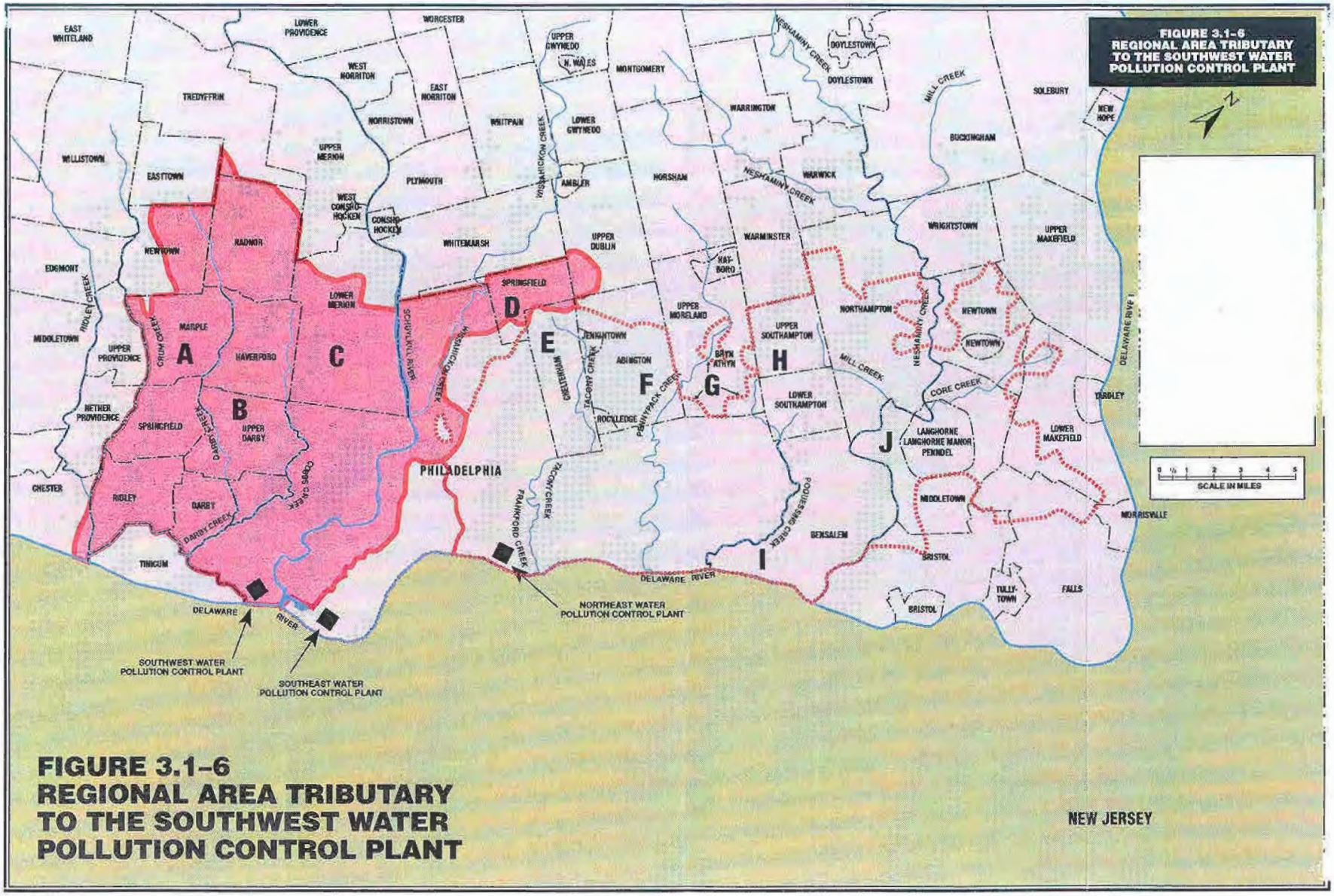

FIGURE 3.1-6
REGIONAL AREA TRIBUTARY TO THE SOUTHWEST WATER POLLUTION CONTROL PLANT

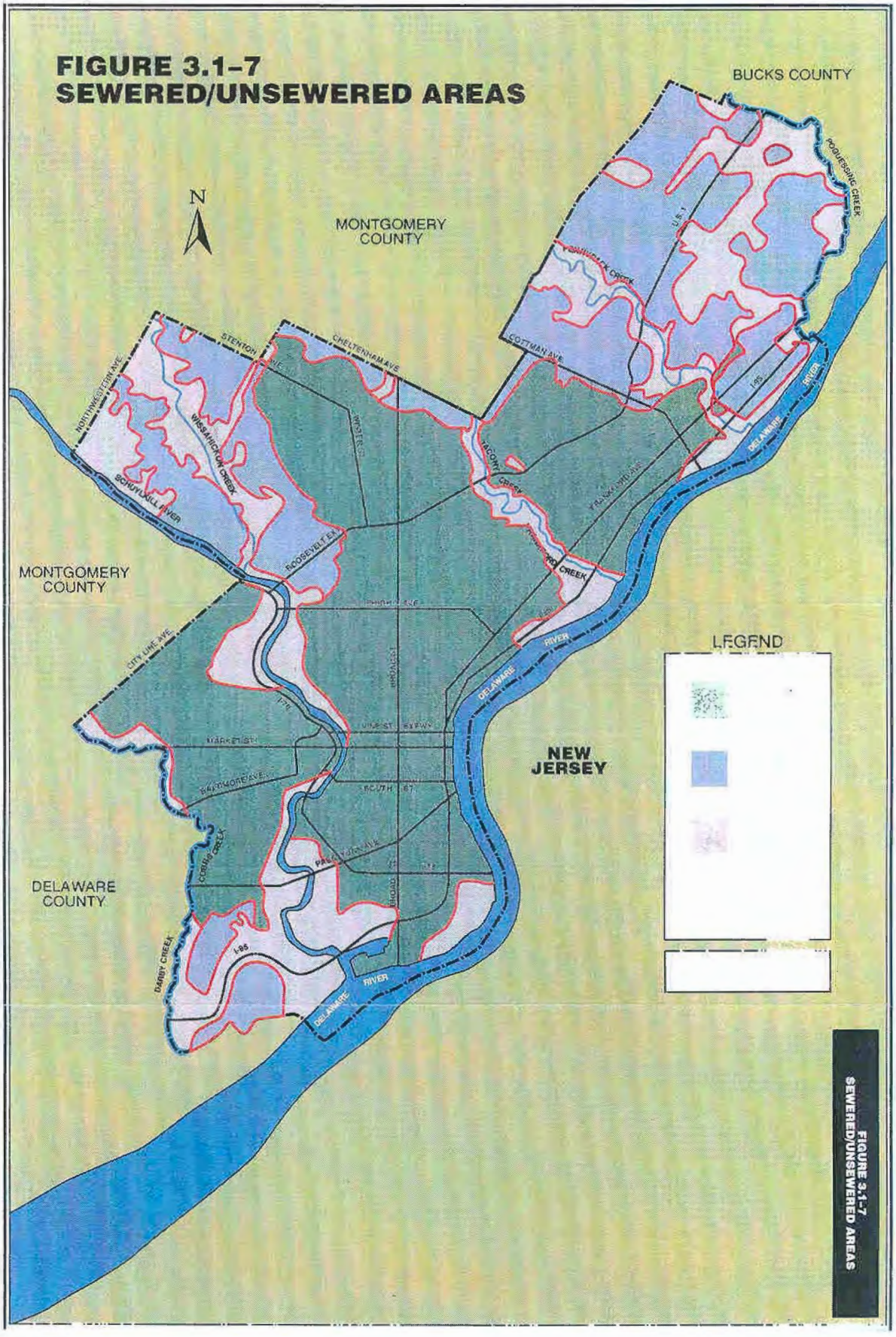
FIGURE 3.1-7
SEWERED/UNSEWERED AREAS
BUCKS COUNTY
N
MONTGOMERY COUNTY
MONTGOMERY COUNTY
DELAWARE COUNTY
NEW JERSEY
POQUESSING CREEK
PENNYPACK CREEK
COTTMAN AVE
CHELTENHAM AVE
STENTON AVE
NORTHWESTERN AVE
WISSAHICKON CREEK
SCHUYLKILL RIVER
ROOSEVELT EXPY
TACONY CREEK
FRANKFORD CREEK
DELAWARE RIVER
CITY LINE AVE
MARKET ST
BALTIMORE AVE
CRUM CREEK
DARBY CREEK
I-95
LEGEND
FIGURE 3.1-7
SEWERED/UNSEWERED AREAS

Although the Delaware and Schuylkill Rivers are the main sources of the City's water supply, 0.08 percent (530) of the City's 675,000 dwelling owners have reported that they utilize groundwater as a potable water supply. Additionally, a number of industries withdraw groundwater for non-potable purposes. Furthermore, it should be noted that all treated wastewater is discharged to the Delaware.

3.1.5.1 Delaware River

The Delaware River is Pennsylvania's only major undammed river; it borders the City of Philadelphia on the east and south. Its sub-basin has the highest water usage in the state and is the receiving body for most of the point discharges in the region. Although the river currently provides high-quality fishing for bass, walleye, pike, muskie, migrating shad, striped bass, catfish, river sturgeon, blueback herring, carp and eels, in the 1940s, reported dissolved oxygen (DO) levels of zero virtually eliminated marine life.

The Delaware Estuary is delineated by tidal freshwater in the Philadelphia-Wilmington-Trenton-Camden metropolitan area. This reach of the Delaware River is 85 miles long from Trenton, New Jersey, to Liston Point, Delaware, and flows through the nation's fifth largest urban area. The region has one of the greatest concentrations of heavy industry in the world and is the second largest oil refining and petrochemical complex in the United States. Although manufacturing is declining in the area, it is still a major factor affecting water quality. The estuary's ports form the largest freshwater port in the world, the largest U.S. port in terms of international tonnage, and the second busiest port in the U.S. in total tonnage. The lower Delaware region has a population exceeding 5.7 million people, greater than 40 of the 50 states. Historically, the Delaware Estuary has been one of the most polluted waterways in the country, but it has experienced remarkable recovery in the last decade, making it one of the premier water pollution control success stories in the country. Because of the urban-industrial character of the area and the historical use of the waterway, toxics remain a concern.

The headwaters of the Delaware are located in the Catskill Mountains in Schoharie County, New York. It begins with the confluence of the East and West Branches near Hancock and flows 330 miles to the Atlantic Ocean. The Delaware River drainage basin is 13,000 square miles and spans Delaware, New Jersey, New York, and Pennsylvania. The river system is used as the water supply for almost 10 per cent of the U.S. population. Three dams in the Upper Delaware River Basin provide water for New York City. These reservoirs receive runoff from 917 square miles, about 40 percent of the drainage area of the basin in New York State, and have a combined usable capacity of 271 billion gallons. In 1931, the United States Supreme Court issued a decree in regard to the diversion of water from the Delaware Basin to New York City. This decree, amended in 1954, authorizes New York City to make diversions for its water supply, but requires that a minimum flow of 1,750 cfs must be maintained at Montague, New Jersey. The decree provided for a court-appointed Delaware River Master to control releases and monitor New York City's reservoir system. During severe drought conditions, it is impossible to divert the full 800 mgd for New York City's needs and still meet minimum flow requirements for the Lower Basin. A drought operation formula has been adopted for use during these periods.

The Delaware River Basin Commission (DRBC), an interstate-federal compact agency, is charged with regulating the quantity and quality of water in the basin. The objectives of the DRBC in regard to quantity are:

- To assure satisfactory minimum-sustained streamflows at key locations during critical drought periods
- To limit the intrusion of seawater in the tidal Delaware River Estuary
- To see that the stream system is replenished after critical drought periods

Water quality standards set by the DRBC protect a safe and satisfactory condition for :

- Agricultural, industrial, and public water supplies
- Wildlife, fish, and aquatic life
- Recreation
- Navigation
- Controlled and regulated waste assimilation

Effluent quality standards dictate limits for all dischargers. All wastewater must receive a minimum of secondary treatment and be disinfected before discharge to the Delaware River. Limits have been set for both wastewater treatment facilities and industrial dischargers in regard to suspended solids, oil and grease, dissolved oxygen, temperature, pH, phenols, odor, synthetic detergents, radioactivity, fecal coliform, total dissolved solids, turbidity, and BOD_5. In addition, guidelines have been adopted that limit the concentrations of oil, persistent pesticides, and other toxic substances including arsenic, barium, cadmium, chromium (hexavalent), lead, mercury, selenium, and silver.

3.1.5.2 Schuylkill River

Of all the rivers in southeastern Pennsylvania that are tributary to the Delaware River Estuary, the Schuylkill River is the largest and has the highest water reuse of all sub-basins in the state. The Schuylkill drainage basin is 80 miles long and 25 miles wide, with a drainage area of 1,909 square miles above the confluence with the Delaware River. The Schuylkill River has its headwaters in Schuylkill County. The river forms the boundary between the City of Philadelphia and Montgomery County from Northwestern Avenue to City Line Avenue and flows generally south through the City to the Delaware River Estuary.

The upper portion of the river has been severely degraded by acid mine drainage and serious organic and nutrient pollution. Historically, some of the tributaries in this area have been known to run black with coal fines. There has been an effort to control sediment loads in the river and its tributaries, and the water quality has improved significantly over the last 30 years.

Dischargers to the lower Schuylkill include wastewater treatment plants, oil refineries, chemical industries, manufacturing operations, and the Limerick Nuclear Power Plant. The lower portion of the river from Fairmount Dam to the Delaware is an estuary with a range of tidal fluctuations of about 5.5 feet. Although there is a great diversity of fish above Fairmount Dam, many problems have been experienced in that portion of the river within the Philadelphia city limits. Combined sewer overflows during heavy rainfall affect water quality between Fairmount Dam and Grays Ferry Bridge. In the past, dissolved oxygen levels have been at or above saturation levels. Many of the problems in this area are caused by heated and oxygen-consuming waste discharges.

3.1.5.3 Wissahickon Creek

Wissahickon Creek is a tributary of the Schuylkill River and has a drainage area of 63.8 square miles. Its source is in the northern portion of Montgomery County. The Wissahickon enters the City from the northwest and converges with the Schuylkill River at Fairmount Park. Dischargers to the Wissahickon include wastewater treatment plants and industrial dischargers such as manufacturing, chemical, and pharmaceutical companies.

3.1.5.4 Pennypack Creek

Pennypack Creek is a major tributary of the Delaware River Estuary. With headwaters in Montgomery County, it flows from the county line in the Northeast section of Philadelphia to the Delaware River. Sewage treatment plants and non-point contamination from the Pennsylvania Turnpike have an effect on water quality.

3.1.5.5 Poquessing Creek

Poquessing Creek is the northeastern boundary of the City. It originates in Lower Bucks County and flows east to the Delaware River. The overall water quality of Poquessing Creek has been satisfactory with high levels of dissolved oxygen in the summer months. Periodically, ammonia-nitrogen values exceed 0.5 mg/l and high suspended solid levels have been recorded during storm events.

3.1.5.6 Tacony Creek

Tacony or Frankford Creek originates in Montgomery County in the Jenkintown/Glenside area. It flows to the Delaware River through the northcentral region of the city. The water quality of Tacony Creek is comparable to the Poquessing Creek. Combined sewer overflows during heavy rains can contribute to periodic high levels of bacterial contamination.

3.1.5.7 Cobbs Creek

The headwaters of Cobbs Creek are in the Haverford section of Delaware County. It is a tributary of Darby Creek and forms the southwest boundary of the City. Cobbs Creek can also be adversely affected by combined sewer overflows during wet-weather events.

3.1.5.8 Mingo Creek

Mingo Creek lies in the southern tip of the City, west of the Schuylkill River. It is a relatively small stream that does not flow beyond the City limits, and much of it has been controlled in storm drain culverts and lined channels. The creek no longer follows its original course. It is a discharge point for some large industrial users.

3.1.5.9 Parks and Recreation

The main recreational uses of the surface waters within the City are fishing and boating. Although City regulations prohibit swimming in any of the rivers, creeks or streams without Fairmont Park Commission approval, there is some unapproved swimming at undesignated points. Pollution and safety considerations make this a dangerous activity. The waterfront areas of the Delaware have been targeted for commercial, residential and recreational development. This resurgence represents significant economic benefits from investments in water pollution control facilities. The Upper and Middle Delaware segments are part of the National Wild and Scenic Rivers System. Some portions of the Schuylkill have been selected for inclusion in the Pennsylvania Scenic River Inventory. The areas adjoining many of the rivers and streams in the City have been developed as parks and recreational sites with facilities for picnicking and other outdoor activities. For instance, Fairmount Park is the largest city park in the world. Both the Schuylkill River and Wissahickon Creek flow through this area. Cobbs Creek and Pennypack Creek have park land along their shores. The Tacony Creek flows through Juniata Park. The major Parks within Philadelphia are delineated on Figure 3.1-8. Neighborhood parks are not included.

3.1.6 Wetlands

Wetlands can be defined as areas of land that retain water long enough to promote the formation of hydric soils and support the growth of aquatic plant life. The consideration of wetlands is important due to their ability to retain water and their use as a habitat for unique species of wildlife that depend on them for food and reproduction. As one of the oldest metropolitan areas in the United States, Philadelphia is almost entirely developed, with the majority of the wetlands that once existed within the City having since been drained. However, as indicated on the National Wetlands Inventory maps, dated from March 1972 to August 1981, there remain a few scattered areas of wetlands throughout Philadelphia. These areas have been mapped and are indicated in Figure 3.1-9, Wetlands Location Map. This report limits its concern to areas of wetlands in the vicinity of high-density on-lot disposal systems, the water supply facilities, and the WPCPs.

There are three primary types of wetlands found within the City: palustrine, lacustrine, and riverine. These are classified according to geomorphology, hydrology, biology, and chemistry. Palustrine wetlands systems are nontidal freshwater wetlands systems that host a wide variety of emergent vegetation such as trees, shrubs, and moss. These wetlands retain storm water runoff from surrounding areas and periods of high groundwater. Unlike palustrine wetlands systems, lacustrine systems are often in the form of ponded basins. These ponded basins may be fed by storm water, runoff, or groundwater, where the emergent wetlands vegetation grows along the

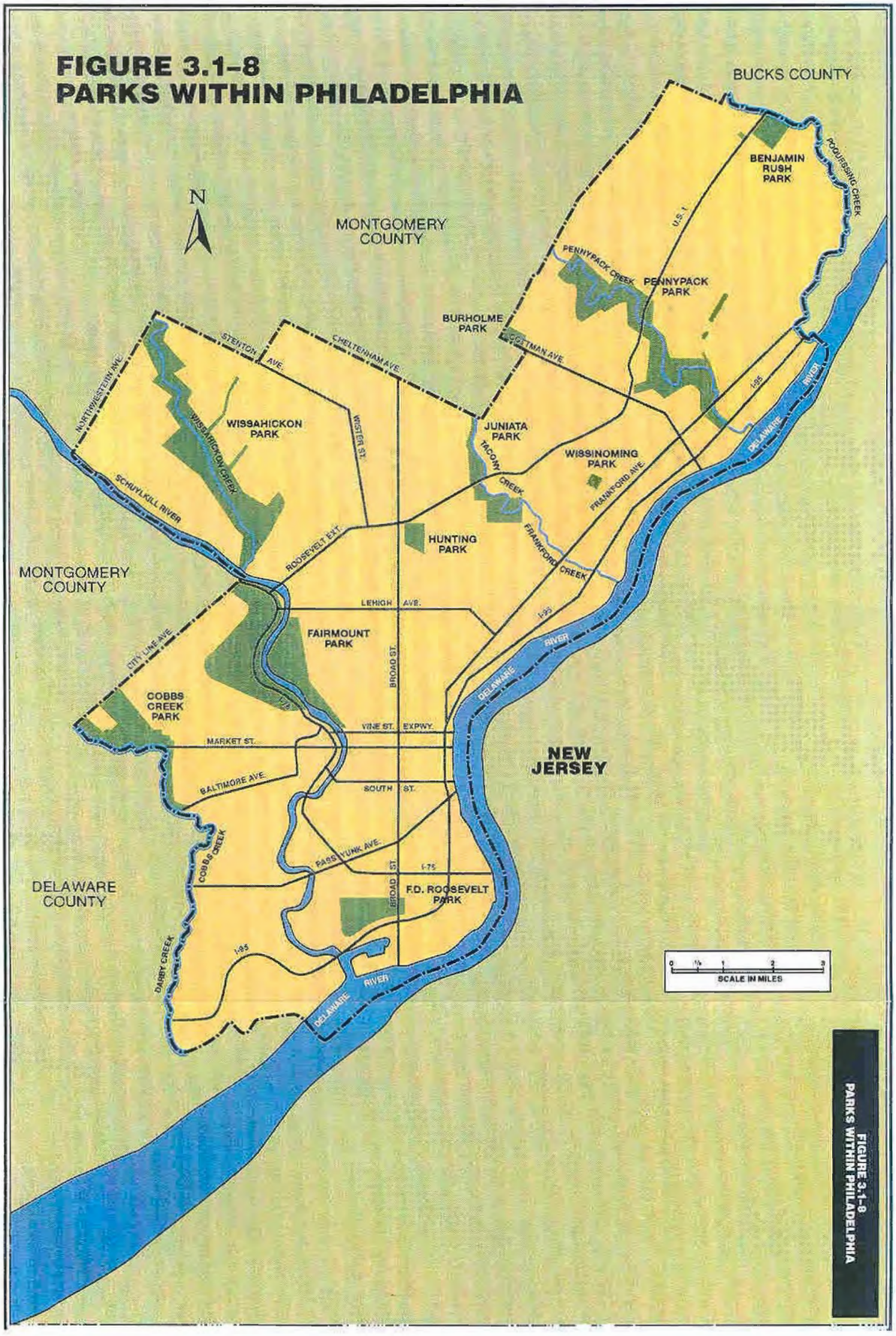
FIGURE 3.1–8
PARKS WITHIN PHILADELPHIA
BUCKS COUNTY
MONTGOMERY COUNTY
MONTGOMERY COUNTY
DELAWARE COUNTY
NEW JERSEY
N
BENJAMIN RUSH PARK
PENNYPACK PARK
BURHOLME PARK
WISSAHICKON PARK
JUNIATA PARK
WISSINOMING PARK
HUNTING PARK
FAIRMOUNT PARK
COBBS CREEK PARK
F.D. ROOSEVELT PARK
POQUESSING CREEK
PENNYPACK CREEK
U.S. 1
I-95
DELAWARE RIVER
STENTON AVE.
CHELTENHAM AVE.
GERMANTOWN AVE.
NORTHWESTERN AVE.
WISSAHICKON CREEK
SCHUYLKILL RIVER
WISTER ST.
TACONY CREEK
FRANKFORD AVE.
FRANKFORD CREEK
ROOSEVELT EXT.
LEHIGH AVE.
CITY LINE AVE.
BROAD ST.
I-76
VINE ST. EXPWY.
MARKET ST.
BALTIMORE AVE.
SOUTH ST.
COBBS CREEK
PASSYUNK AVE.
I-75
DARBY CREEK
I-95
SCALE IN MILES
FIGURE 3.1-8
PARKS WITHIN PHILADELPHIA

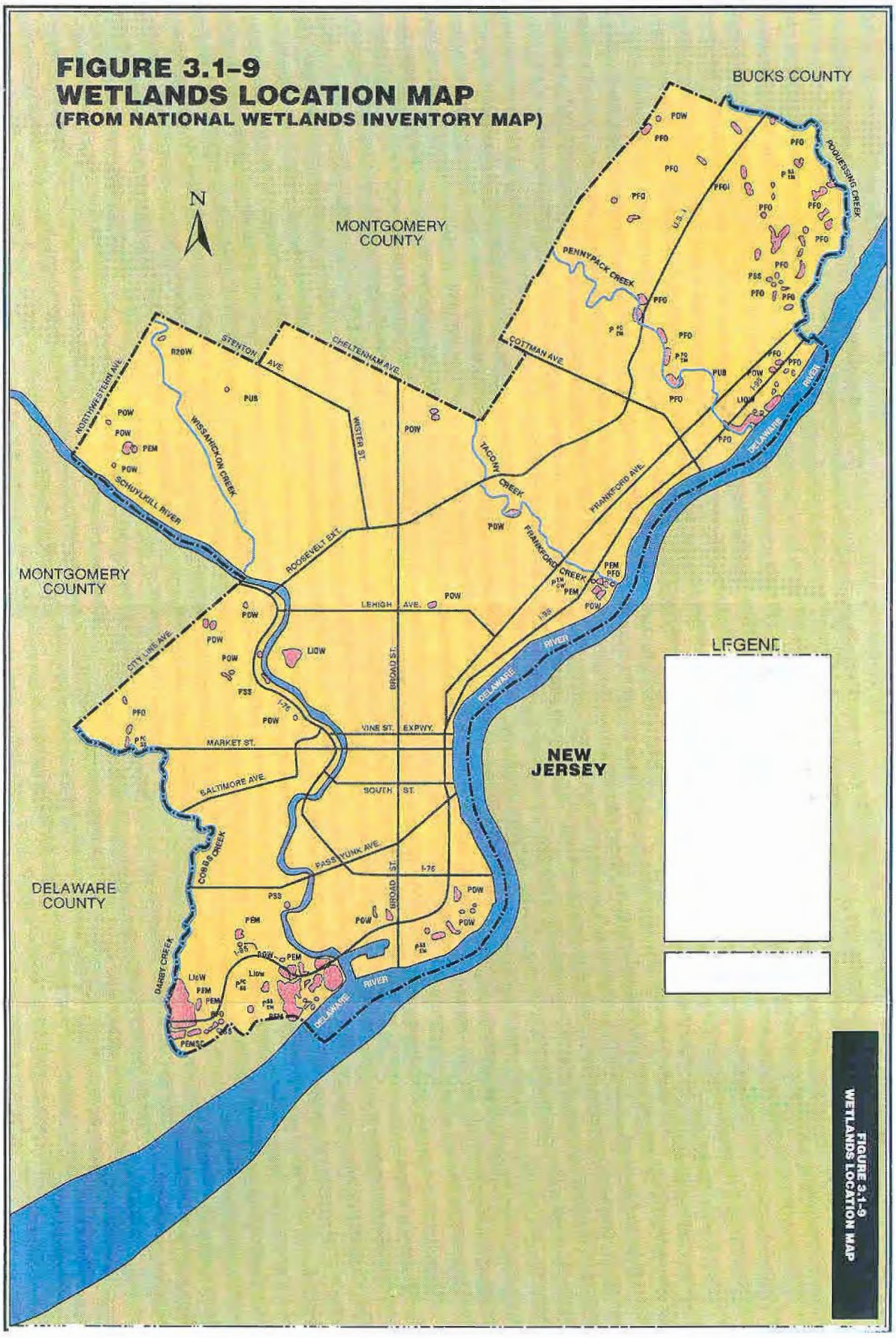
FIGURE 3.1-9
WETLANDS LOCATION MAP
(FROM NATIONAL WETLANDS INVENTORY MAP)
BUCKS COUNTY
MONTGOMERY COUNTY
MONTGOMERY COUNTY
DELAWARE COUNTY
NEW JERSEY
N
LEGEND
DELAWARE RIVER
SCHUYLKILL RIVER
WISSAHICKON CREEK
TACONY CREEK
FRANKFORD CREEK
PENNYPACK CREEK
POQUESSING CREEK
COBBS CREEK
DARBY CREEK
STENTON AVE.
CHELTENHAM AVE.
COTTMAN AVE.
FRANKFORD AVE.
ROOSEVELT EXT.
LEHIGH AVE.
CITY LINE AVE.
MARKET ST.
BALTIMORE AVE.
SOUTH ST.
PASSYUNK AVE.
VINE ST. EXPWY.
BROAD ST.
WISTER ST.
NORTHWESTERN AVE.
U.S. 1
I-95
I-76
PFO
PEM
PSS
PUB
POW
L1OW
R2OW
FIGURE 3.1-9
WETLANDS LOCATION MAP

edges of these bodies of water. Usually there is a free exchange of water between lacustrine systems and the surrounding groundwater. Riverine wetlands systems occur along streams and rivers and are fed by runoff and groundwater sources. Riverine systems usually have adjacent wetlands of other types into which freshwater seepage occurs.

Due to Philadelphia's urban environment, there are not many large wetlands areas, but there are several significant areas that must be taken into consideration due to their proximity to the WPCPs and areas with on-lot sewage disposal systems.

There are apparent wetlands areas in the vicinity of Philadelphia's WPCPs, as identified in the National Wetland Inventory maps, that will have to be considered during planning efforts including modifications of the existing plants. These wetlands may have a potential impact on any plans for expansion or modifications of the WPCPs. The wetlands that are in the vicinity of the WPCPs are described in Table 3.1.3. It is also important to note, however, that field delineations will be necessary to verify the presence and exact location of wetlands prior to final design.

While contemplating sewer extensions into areas of high density on-lot disposal systems, wetlands will be germane to a variety of planning considerations due to the potential impact on construction methods and costs, or the location of certain wetlands that may influence sewer layout and/or feasibility.

The remainder of the wetlands in Philadelphia are located primarily in Pennypack Park, Fairmount Park, and adjacent to Wissahickon Creek. These wetlands are principally riverine and palustrine systems. There are also a few scattered palustrine wetlands systems to the southeast of the Northeast Philadelphia Airport that will probably not have an impact on wastewater-related projects.

3.1.7 Water Supply System

The Delaware and Schuylkill Rivers are the primary source of raw water for the City of Philadelphia. Heavy industrial and port facilities and a densely populated urban area result in high water usage. The Philadelphia Water Department treats and supplies approximately 342 mgd of water to the City of Philadelphia and sells an additional 16 mgd to the Bucks County Water and Sewer Authority, located northeast of the City.

3.1.7.1 Water Treatment Plants

PWD maintains three water treatment plants to meet the needs of the City. Treatment is generally the same in all three facilities and the process usually consists of sedimentation, pre-chlorination, chemical treatment, flocculation, sedimentation, filtration, and post-chemical treatment. All three plants have reservoirs to accommodate an approximate 1-day storage capacity.

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TABLE 3.1.3
SIGNIFICANT WETLAND AREAS AS SHOWN ON THE NATIONAL WETLANDS INVENTORY MAP
FIGURE 3.1.5

Location	Size	Type	Significance	Remarks
Adjacent to Northeast Sewage Treatment Works	94 Acres	Palustrine	Former sludge dewatering lagoon	Open water
Adjacent to Northeast Sewage Treatment Works	3.4 Acres	Palustrine	Close to water pollutino control plant	Forested
Adjacent too Southwest Sewage Disposal Works	559.8	Lacustrine/ Plaustrine	Former sludge dewatering lagoon	Open water
Adjacent to Southeast Sewage Disposal Plant	9.6 Acres	Palustrine	Former sludge dewatering lagoon	Open water
In vicinity of Byberry Rd. at Philadelphia County border	8.6 Acres	Palustrine	Adjacent to on-lot disposal area "A"	Broad-leaved deciduous trees
In vicinity if Byberry Rd. at Philadelphia County border	0.9 Acres	Palustrine	Within on-lot disposal area "A"	
In vicinity of the intersection of Norwalk Rd., Morefield Rd., and Krewstown Rd.	9.2 Acres	Palustrine	Adjacent to on-lot disposal area "B"	Broad-leaved deciduous trees
Upper Roxborough Reservoir	23 Acres	Facilitates palustrine	Adjacent on on-lot disposal area "D"	

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The Belmont Water Treatment Plant is located on Belmont Avenue, south of City Line Avenue. The water is pumped from the Schuylkill River and serves that portion of the City west of the river. This plant treats an average of 60 mgd.

The Queen Lane Water Treatment Plant is located on West Queen Lane, in the East Falls section of the City. This plant also pumps water from the Schuylkill River and treats an average of 100 mgd. It serves the northwest portion of the City and a large section of North Philadelphia east of the Schuylkill River and north of Callowhill Street. The Queen Lane Plant is totally automated.

The Samuel Baxter Water Treatment Plant is on State Road in the Torresdale section of the City and serves the eastern half of the City, bounded on the west and north by the Schuylkill River, Roberts Avenue, and Tabor Road, and to the east by the City limits. Areas served jointly by the Baxter and Queen Lane Treatment Plants include Hartwell Lane in Chestnut Hill, East Mt. Airy, and West Oak Lane. The source of supply is the Delaware River. This plant treats an average of 200 mgd. The Baxter Plant maintains a taste and odor control lab for all three plants.

3.1.7.2 Water Quality and Quantity

The three water treatment plants have a combined rated capacity of 543 mgd and a total peak capacity of 681 mgd. COWAMP projections indicate that this supply will be sufficient to meet the needs of the City through the year 2020. Philadelphia water meets or exceeds all physical, chemical, radiological, and bacteriological water quality standards established by EPA under the Safe Drinking Water Act. Three laboratories monitor water quality to ensure compliance with all limits. A City ordinance requires fluoridation of the finished water supply.

In addition, the PWD's Planning and Research Unit is involved in a corrosion control study to determine a uniform strategy to reduce corrosion in the City's distribution system. The effectiveness of the chemical inhibitors used by the PWD to minimize corrosion will be evaluated on the basis of infrastructure protection, lead dissolution, water quality, and costs. A future study will examine alternatives for reducing the corrosion rates by using a variety of chemical inhibitors and other schemes.

The PWD has reduced the level of trihalomethanes (THMs) in the finished product by changing the chlorination points in all three water treatment plants. THM levels in water treated by PWD have consistently been below the EPA Maximum Contaminant Level.

3.1.7.3 Operations and Maintenance

The PWD maintains the water treatment plants, pumping stations, and related systems in 89 separate facilities. There are 3,300 miles of water mains, ranging in diameter from 3 inches to 93 inches, with an average age in excess of 70 years. The oldest mains are circa 1820. The distribution system also includes 500,000 service connections, an estimated 3,000 to 4,000 miles of service lines, 83,600 valves, 27,800 pressure fire hydrants, and 15 pumping stations in a 130 square mile service area. The PWD has a preventive maintenance program that includes routine dismantling, cleaning, repairing, and inspection of pumps within the system. A large-valve

inspection and overhaul program was implemented in 1988. The PWD Load Control oversees the maintenance and renewal of large-diameter water mains, pumps, storage basins, reservoirs, tanks, and treatment plant facilities when their capacity is impacted.

In an effort to reduce customer under-registration, a 10-year program to replace 400,000 5/8-inch mechanical meters is in progress. Old meters are being replaced with magnetic meters that are more accurate, easier to read, less costly to repair, and hermetically sealed.

Safety in the water treatment plants is a concern of PWD. In addition to "Right to Know" training, other chemical safety training is available. All new employees are issued safety manuals. Alarm systems, inspections, and periodic meetings are additional efforts employed to maintain safety in the treatment facilities.

Employees are encouraged to improve their technical skills through seminars and training films on various topics offered in-house, and they have the opportunity to attend other types of training programs offered by private corporations.

3.1.7.4 Conservation Efforts

Philadelphia has revised its Plumbing Code to require DRBC mandated conservation plumbing fixtures, including the 1.6 gallon water closet.

In an effort to reduce the water in the system that is not accounted for, PWD has pursued a systemwide leakage detection and repair program for decades. The percentage of unaccounted for water has varied between 31 percent and 39 percent over the last 15 years. The Leak Detection Program conserves water and reduces operating costs. In addition, it is cost-effective in minimizing property damage suits, poor public relations, emergency repairs, expansion of treatment facilities, and water pressure problems. In 1983, the program was accelerated as the water industry realized the efficacy of such a program. PWD maintains a unit that specializes in leak detection and flow measurement and is responsible for leakage abatement. Using electronic listening devises to pinpoint the source of leaks in the distribution system, this unit has been able to significantly reduce leakage and effect measurable cost savings.

A Capital Improvement Program provides funds for infrastructure replacement and rehabilitation. The rate of capital expenditures has increased significantly over the past 15 years to address a growth rate of 1.8 percent in main breaks per 1,000 miles. The prioritized list of projects is incorporated into a 6-year capital program that is revised on a yearly basis to include the latest information.

Hydrant abuse programs are another means to conserve water. To combat the problem of illegal openings, the PWD has installed locking devices on many fire hydrants. In addition, the Public Affairs Division operates an aggressive hydrant abuse education campaign each summer. This multimedia campaign targets both children and adults. It is anticipated that over a period of years, this program will result in reductions of pumped water, peak demands, low-pressure episodes, and the costs of treatment and pumping.

3.1.7.5 Other Sources of Water Supply

Within the City, some residents utilize wells as their source of supply or obtain water from neighboring municipalities. Moreover, there are users within the City who are not hooked up to either the public water or sewer systems. Presently, there are approximately 530 wells within the City limits. Wells are not confined to any particular section of the City, but scattered throughout the entire area. Table 3.1.4 is a summary of well distribution as identified by PWD's "Sewer Only" accounts. Approximately one-third of these accounts are non-residential.

3.1.7.6 Types of Water Usage

The City of Philadelphia is 99 percent metered. Meter size is the basis for billing rates in most cases. The Water Revenue Bureau of the Department of Revenue identifies several categories of water usage: residential, commercial, large industrial, charitable, public, and senior citizens. Charitable users are institutional in nature and include hospitals and universities. State, County, and City properties are grouped under the public category. Senior citizens in the City receive a 25 percent discount on their water bills, and their accounts are coded to designate that status.

3.1.7.7 Potable Water Storage

PWD has the option to respond to extreme drought conditions by drawing its supply from both the Delaware and the Schuylkill River systems, which is a significant advantage held in reserve, should this condition ever occur. Each of the three water treatment plants has an approximate one-day storage capacity without pumping from the rivers. Finished water pumping and storage capacity provide a short-term reserve margin. The current total storage capacity is 932 mg, of which 503 mg is filtered water storage. The treated water storage capacity to be realized upon completion of East Park Reservoir Basin rehabilitation is 814 mgd.

In 1984, a good-faith agreement was executed among the states dependent on the Delaware River that defines new patterns for dividing of the Basin's resources during drought periods. The agreement has a provision calling for expansion and improvement of impoundment storage capacities to provide larger reserves against protracted droughts. The City is studying methods to increase storage capacity, including expansion of the Francis E. Walter Reservoir on the Lehigh River Basin of the Delaware River for flow augmentation; however, the cost of implementing a storage expansion program is an important factor to be considered.

3.2 CONTRIBUTING MUNICIPALITIES/AUTHORITIES

The size and scope of Philadelphia's wastewater system is a result of the regional approach to water quality management that was prevalent from the 1940s through the 1960s. At that time it was felt that the most efficient method of providing wastewater treatment was through large, centrally located treatment facilities with extensive and complex collection systems and service areas. In the past 20 years, conventional wastewater planning has deviated from this philosophy, recognizing that smaller, localized treatment facilities and on-lot disposal systems, where

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TABLE 3.1.4

WELL DISTRIBUTION

	Area	No. of Wells
A	Center City	19
B	South Philadelphia	58
C	Southwest Philadelphia	13
D	West Philadelphia	77
E	Lower North Philadelphia	35
F	Upper North Philadelphia	54
G	Bridesburg/Kensington/Richmond	44
H	Roxborough/Manayunk	13
I	Germantown/Chestnut Hill	21
J	Olney-Oak Lane	39
K	Near Northeast	17
L	Far Northeast	62
	Total	**452**

*Total identified in "Sewer Only" accounts

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appropriate, provide adequate treatment and afford groundwater and small stream recharge, which is generally not true of the larger regional facilities. The three Design Reports on the WPCPs within Philadelphia, dating from March 1972 to October 1973, reflect the planning convention of the time; Philadelphia has agreements with 10 outlying municipalities/authorities to accept, convey, treat, and dispose of their wastewater. Although the regional concept has not expanded as projected in the Design Reports, the relationship between Philadelphia and these ten municipalities/authorities continues with benefit to all.

When evaluating Philadelphia's wastewater system, it is essential to understand the intermunicipal relationship that Philadelphia has and the wastewater flows it accepts from 10 of its neighboring municipalities/authorities. Philadelphia has had a long-standing relationship with these municipalities/authorities that will continue to have a direct impact on the City's wastewater facilities. The municipalities/authorities listed below are considered in this report regarding service areas, intermunicipal agreements, wastewater flows, and fees:

- Township of Abington
- Bensalem Township Authority
- Bucks County Water and Sewer Authority
- Township of Cheltenham
- The Delaware County Regional Water Quality Control Authority (DELCORA)
- Township of Lower Merion
- Township of Lower Moreland and the Lower Moreland Township Authority
- Lower Southampton Municipal Authority
- Township of Springfield, Montgomery County
- Upper Darby Township

The terms of these relationships are detailed in contractural agreements executed between the City and each municipality and authority. The information presented in the following sections outlines the terms agreed to within these agreements. The agreements themselves are available at the PWD for further service.

3.2.1 Service Areas

The areas of each of the above-mentioned, outlying municipalities, serviced by the PWD have been delineated on Figure 3.2-1, Contributing Outlying Municipalities/Authorities. The areas of each of these municipalities/authorities and their contributions to the service areas of each of the three water pollution control plants are presented in Table 3.2.1.

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TABLE 3.2.1

AREAS CONTRIBUTED TO PHILADELPHIA WASTEWATER SYSTEM BY OUTLYING MUNICIPALITIES/AUTHORITIES

Tributary Area	Northeast (acres)	Southeast (acres)	Southwest (acres)
Philadelphia	42,500	13,200	27,200
Suburban			
Abington	4,500	-----	-----
Bensalem	4,400	-----	-----
Bucks County	45,000	-----	-----
Cheltenham	8,300	-----	-----
Lower Moreland	900	-----	-----
Lower Southampton	7,700	-----	-----
Springfield	-----	300	4,500
DELCORA	-----	-----	52,200
Lower Merion	-----	-----	12,100
Upper Darby	-----	-----	7,800
Total Suburban	70,800	300	76,600
Total	113,300	13,500	103,800
Total Area Served	230,600		

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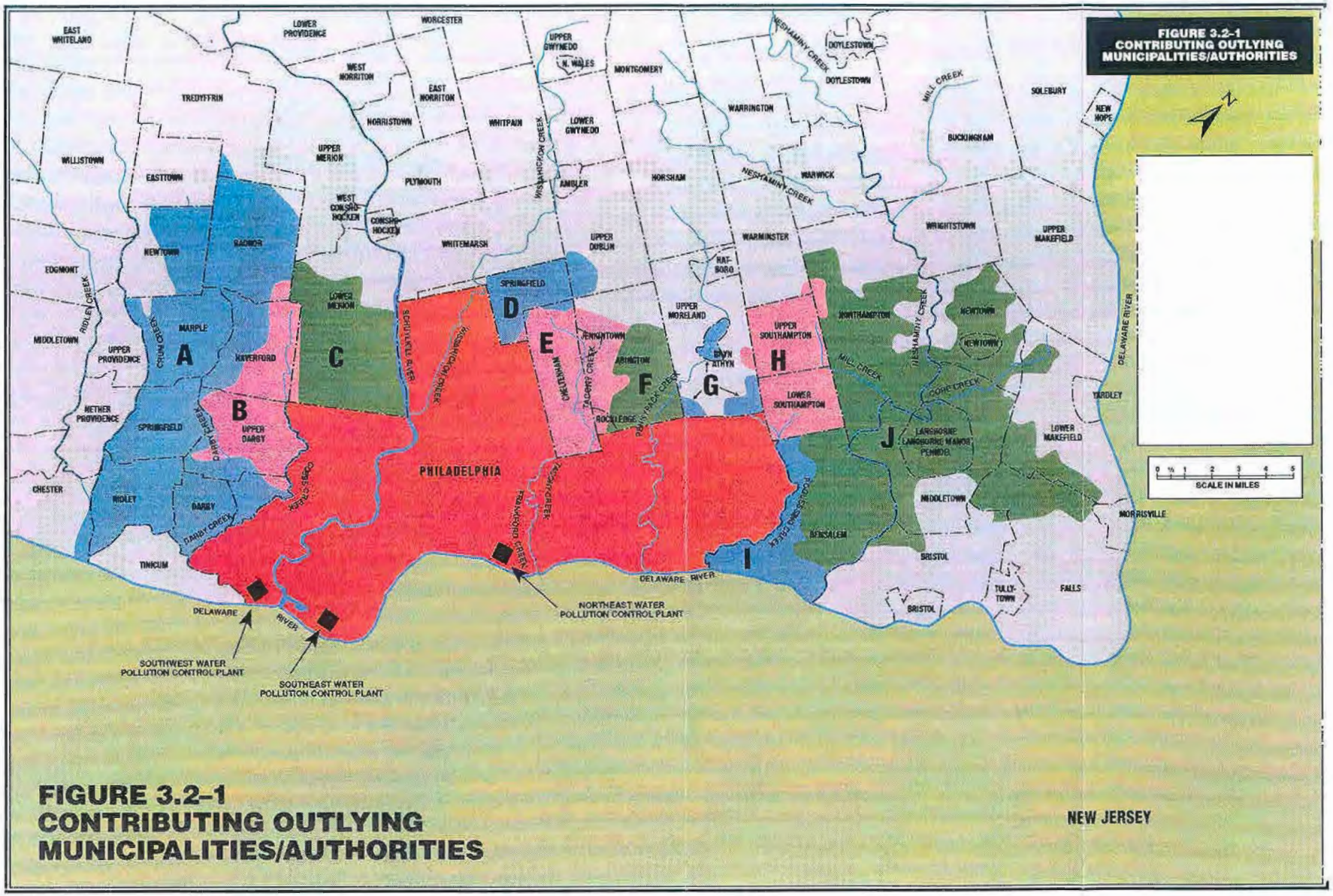

FIGURE 3.2–1
CONTRIBUTING OUTLYING
MUNICIPALITIES/AUTHORITIES

The Philadelphia system, as defined by the intermunicipal agreements, is presented below to fully describe the service areas of each of the three water pollution control plants. Because drainage areas do not necessarily correspond to political boundaries, there is some overlap of municipalities in each agreement and authorities may involve more than one municipality. Furthermore, sections of some municipalities will be covered by an agreement of another municipality/authority even though that municipality may have an agreement of its own.

Township of Abington - The drainage area to the Northeast WPCP is the area of the watershed of Pennypack Creek in the Township of Abington, the Borough of Rockledge and, a portion of the Tacony Creek watershed in the Borough of Rockledge, and the Abington portion of the Tacony Creek watershed adjoining Rockledge.

Bensalem Township Authority - The drainage area includes the area of Bensalem Township, which is within the Poquessing Creek watershed.

Bucks County Water and Sewer Authority - The agreement between Philadelphia and the Bucks County Water and Sewer Authority covers those areas within the Authority that are serviced by the Neshaminy Interceptor system and the Totem Road Pumping Station within the Neshaminy Creek watershed. This area includes all or parts of the following municipalities:

Bensalem Township
Bristol Township
Falls Township
Hulmeville Borough
Langhorne Borough
Langhorne Manor Borough
Lower Makefield Township
Lower Southampton Township
Middletown Township
Newtown Borough
Newtown Township
Northampton Township
Penndel Borough

Township of Cheltenham - The drainage area includes those areas that are in the Tacony Creek watershed in the Township of Cheltenham, Township of Abington, Borough of Jenkintown, and a certain portion of the City of Philadelphia whose wastewater flows through the sewers of Cheltenham, thence into the City's sewers.

The Delaware County Regional Water Quality Control Authority (DELCORA) - This agreement covers an extensive area under the unified responsibility of DELCORA, including those areas in the Darby, Crum, Ridley, and Chester Creek watersheds. This area once coincided with the service area boundaries of the Muckinipates, Central Delaware County, Darby Creek Joint, and Radnor-Haverford-Marple Authorities. The municipalities included in this agreement in whole or in part include the following:

Borough of Norwood
Borough of Glenolden
Borough of Swarthmore
Haverford
Radnor
Newtown

Borough of Morton
Borough of Rutledge
Borough of Prospect Park
Borough of Ridley Park
Township of Darby
Township of Upper Darby
Township of Ridley
Township of Springfield
Township of Marple
Township of Nether Providence
Upper Providence
Tinicum
Borough of Eddytone
Borough of Norwood
Borough of Folcroft

Township of Lower Merion - This agreement includes all of the Township and parts of Radnor, Haverford, and Narberth that are within the drainage basin of the Schuylkill River.

Township of Lower Moreland and the Lower Moreland Township Authority - The areas serviced by this agreement are specified on Figure 3.2-1, they and include some areas in Lower Moreland within both the Pennypack and Poquessing Creeks watersheds.

Lower Southampton Municipal Authority - Those areas of Lower Southampton that are within the Poquessing Creek watershed are covered under this agreement.

Township Springfield, Montgomery County - Areas of Springfield, Cheltenham Township, Upper Dublin Township, and Whitemarsh Township that are within the Wissahickon Creek watershed are covered by this agreement.

Upper Darby Township - Those portions of Upper Darby that are not included in the DELCORA agreement are covered by this agreement.

3.2.2 Contractual Agreements

As is standard practice and required by the Philadelphia Home Rule Charter, Philadelphia has entered into legal agreements with the organizations from which it accepts wastewater for treatment and disposal. These agreements establish the term of the relationship, connection points between Philadelphia's collection system and that of the municipality/authority, limits to the amount of flow and loadings, financial reimbursement, and other requirements that must be undertaken by the municipality/authority for the PWD's facilities to remain eligible for state and federal funding. Philadelphia made a concerted effort in the late 1980s to reestablish its relationships with the outlying municipalities/authorities by drafting new agreements with most of these neighbors to ensure that the most recent state and federal concerns were being addressed by each of the organizations involved. A summary of the current status of the intermunicipal agreements is shown on Table 3.2.2.

Except for the agreements with Springfield Township, Philadelphia has set up two basic types of agreements to contract wastewater transport, treatment, and disposal services with the outlying municipalities/authorities. They differ primarily in the length of the term and the type of commitment to long-term capital improvements, with which each outlying municipality/authority wishes to be involved. It is advantageous to the City to enter into longer term agreements for long-term needs and allocation of resources; therefore, these agreements are encouraged. However, some municipalities feel more comfortable with shorter term agreements that can be more easily adapted to evolving needs and treatment requirements. The issue of making the appropriate contribution to capital improvements and the resultant repayment of bond obligations is handled separately for these two types of agreements. The long-term agreement usually includes a capital contribution paid up front, based on the proportion of the contracted capacities and present value of the facilities. With the capital contribution, the fees paid by the outlying municipality/authority for conveyance, treatment, disposal, and maintenance do not include a contribution to the repayment of bond obligations. This agreement also includes a commitment by the outlying municipality/authority to contribute to improvements and expansions as required by state and federal statutes. The standard length of term for a long-term agreement is 35 years with a 5-year notification of intent to dissolve the relationship. While not including an up-front capital contribution, the short-term agreements include a charge for the current bond repayment obligation. These shorter agreements are generally for 7 years with a 6-month notification of intent to dissolve the agreement.

All agreements, long-term and short-term, begin with the recognition that the outlying municipality/authority has a need to dispose of its wastewater and that the PWD has the capacity and desire to fulfill this need. Furthermore, the City commits to setting aside the required capacity and the outlying municipality/authority commits to paying for the treatment and PWD's future ability to maintain such capability. There are other common conditions in the agreements that will become evident upon review of the agreement summaries; however, one stands out and deserves mention. Each agreement (save those for DELCORA and Springfield) includes a recognition of and commitment to the problem of biosolids management. With the increasing pressure to find programs and alternatives for safe biosolids management, the City made it a significant condition of the agreements to seek a cooperative effort on the part of all of the wastewater system users.

The agreement between the City and the Township of Abington is a typical short-term agreement, and similarly, the agreement with the Bensalem Township Authority is a typical long-term agreement. These two agreements will be presented in some detail as examples and have been included in Appendix B. The other agreements that follow will be described according to the ways in which they concur or deviate from these two typical agreements. Springfield is dealt with on its own merits since it is not in the format of either of these typical agreements.

Township of Abington - This agreement was executed in May 1983, and it is a standard short-term (7-year) agreement. It includes the following pertinent terms:

- The City and the Township agree to apply jointly for available grants or loans pursuant to improvements to the PWD wastewater collection, treatment, and disposal facilities. To this end, the Township is committed to adhering to several measures necessary to be eligible for such funding, such as: perform a Sewer System Evaluation Study of the Township's collection system, initiate a User Charges System consistent with EPA guidelines, initiate an Industrial Pretreatment Program at least as stringent as Philadelphia's, and adhere to the terms of the Federal Facilities Cost Recovery Program.

- The Township agrees to pay quarterly fees to the City based on measured and/or estimated flows including charges related to depreciation and return on existing facilities; operations and maintenance; replacement, repairs, and removal facilities; employee benefits; overhead; and non-direct expenses.

- The ownership and responsibility for the City's and Township's collection and treatment facilities remains within the authority of the current owners. Basically, each municipality is responsible for those facilities within its borders; however, the City reserves the right of inspection and sampling of facilities within the Township.

- The agreement establishes the allowable quantities of flow and loadings that may be discharged into the PWD system and the locations where this discharge may occur. Furthermore, the Township is required to install metering chambers for the measurement of flow being discharged, and assures the rights of the City to monitor and sample such flow.

- The Township is restricted from discharging harmful substances into the Philadelphia system, and is liable for any damages caused by any caustic substances that are discharged into the system.

- The Township is committed to Philadelphia's biosolids management program.

- Finally, the agreement sets procedures for inspections and audits; arbitration of disputes; claims, insurance, and related matters; term; no joint ownership; severability; successors; and assigns and waivers.

- An addendum to the agreement cites specific issues such as flow and payment amounts and is discussed further in Section 3.2.3, Wastewater Flows, Loadings, and Fees. It also details conditions for the flows from some homes in Philadelphia that drain to sewers in the Township and thence into the City's sewers.

Bensalem Township Authority - The agreement between the Bensalem Township Authority and Philadelphia is a typical long-term (35-year) agreement that was executed in May 1988. The pertinent details of this agreement are set forth as an example of a long-term agreement.

- The City agrees to set aside the amount of capacity required by the Authority in return for a capital contribution for those PWD collection and treatment facilities installed prior to July 1, 1986, and a second payment for those facilities installed between July 1, 1986, and March 31, 1988. Furthermore, the Authority agrees to pay its proportionate share of future improvements, renewals, replacements, and new facilities as needed, except for new facilities that would be intended solely for the increase of marketable capacity of the plant.

- The agreement includes provisions for the Authority to pay additional fees if it exceeds the flow and loading quantities set forth in the agreement. Furthermore, the Authority must make improvements to its own system if it routinely fails to meet its flow and loadings limits.

- The Authority agrees to pay wastewater treatment charges on a quarterly basis including operations and maintenance, management fees, and direct and indirect expenses.

- Requirements for meters, flow estimations, and sampling necessary to calculate the above charges are also set forth.

- The Authority also agrees to enter into an Interjurisdictional Pretreatment Agreement and co-develop a biosolids utilization program for Bensalem.

- Finally, as set forth in the short-term agreement previously described, the agreement sets terms for the following issues, including inspections and audits; arbitration of disputes; claims, insurance, and related matters; no transfer of rights; term (35 years with a 5-year notice to dissolve the relationship); ownership, management, and control of the plant facilities; severability; successors; and assigns, waivers, and notices.

Bucks County Water and Sewer Authority - In the same vein as the Bensalem Agreement detailed above, the Bucks County Water and Sewer Authority has entered into a long-term agreement with Philadelphia. This agreement was executed in February 1988, and those items that deviate from the Bensalem agreement are presented below:

- The Authority is to pay the City a capital contribution for those wastewater collection and treatment facilities installed up to July 1, 1986, and an additional capital contribution is to be paid for those facilities installed between July 1, 1986, and December 31, 1987.

- The Authority agreed to build, with its own funds, a new pumping station (Totem Road Pumping Station) and force main (State Road Force Main) to facilitate the flow of wastewater from the Neshaminy watershed to the PWD collection system (see Section 4.2.1 Description of Collection System for

further details on the State Road Force Main). The Authority is to own, maintain, and operate the new facilities within Bucks County and the new force main in the City. The City owns and maintains the telemetering devices (modem and data logger) for the system within Bucks County.

- In addition to the establishment of a biosolids utilization program, as previously described, the Authority is to support the community education program concerning the disposal of biosolids and to seek out individuals and groups that would benefit from such an educational program.

- Otherwise, this agreement contains basically the same conditions detailed in the Bensalem Agreement.

Township of Cheltenham - The agreement between the City and Cheltenham, executed in 1987, parallels the short-term agreement with Abington with the following exceptions:

- Philadelphia recognizes that Cheltenham has separate wastewater agreements with Abington and Jenkintown and the intent of this agreement is not to affect these separate agreements.

- Cheltenham recognizes the importance of an effective biosolids management program, and it is committed to full cooperation with the City's biosolids management programs; however, the agreement contains the caveat stating that Cheltenham will not be forced at any time to accept more than its proportionate share of biosolids from the City for management.

The Delaware County Regional Water Quality Control Authority (DELCORA) - The DELCORA agreement is a typical long-term agreement and has a format similar to that described under the Bensalem agreement. This agreement was executed in March 1974 and varies from the Bensalem agreement in the following ways:

- DELCORA agreed to construct and operate, at its own expense, the Eastern Delaware Conveyance System, which is comprised of a pumping station located in the vicinity of the abandoned wastewater pollution control plant of the Darby Creek Joint Authority and a 66-inch force main that terminates at the PWD's Southwest WPCP.

- The City agreed to expand the Southwest WPCP and reserve 50 mgd of capacity for DELCORA.

- Metering and sampling procedures were established similar to those in the Bensalem agreement.

- A complex formula for DELCORA's capital contribution to the expansion of the Southwest WPCP is also presented. The amount of DELCORA's contribution is proportional only to the benefit that is gained by DELCORA's constituent municipalities.

- The City is named as DELCORA's agent for applications for state and federal funding of plant expansion.

- There are conditions times for interim allowable flow and loadings for before and during construction of the aforesaid improvements.

- The agreement has a provision that each party will adhere to state and federal regulations and take the necessary measures to remain eligible for funding; however, it is not explicit about what measures each will have to take.

- Due to the age of the agreement (pre-ban on ocean disposal of biosolids - 1980), it is not explicit about DELCORA's cooperation on biosolids management.

Township of Lower Merion - The Lower Merion Agreement is the most recently executed agreement and corresponds closely to the long-term format established in the Bensalem agreement. The agreement was executed in March 1992 and contains the following exceptions from the Bensalem agreement:

- This agreement contains extensive conditions on payment and grievance procedures associated with the calculation of fees. These conditions include the right of the Township to file objection letters if it does not feel comfortable with the method of calculation of fees.

- Lower Merion has separate wastewater agreements with Radnor, Haverford, and Narberth, and this agreement is not to interfere with these separate agreements.

- Apart from the points of connection defined in an addendum to the agreement, the agreement recognizes a number of homes within Lower Merion that discharge directly into the PWD collection system in City Line Avenue. These connections are to remain based on the conditions detailed in the agreement.

Township of Lower Moreland and the Lower Moreland Township Authority - This short-term agreement between the PWD and the Township and Authority was executed in October 1987. The agreement is similar to the Abington agreement, except as noted below:

- The City and Lower Moreland agreed to adhere to the terms of their previous agreement, dated January 27, 1983, through July 1, 1989.

- The City agreed to design and construct an "Express Sewer" from the boundary with Lower Moreland within Welsh Road to the Darlington Run Interceptor. The interceptor was constructed 15 inches in diameter, some 2,200 linear feet in length, and was paid for by Lower Moreland. The ownership and responsibility for the interceptor remains with the City.

- Lower Moreland agreed to set aside funds in escrow to cover the estimated cost of the Express Sewer and a connection fee.

Lower Southampton Municipal Authority - The long-term agreement between Philadelphia and Lower Southampton closely parallels the Bensalem agreement. There are no significant deviations between these two agreements. The Lower Southampton agreement was executed in December 1988 and provides for a capital contribution from Lower Southampton to the City for those wastewater facilities installed before July 1, 1985, and a similar payment for those facilities installed from July 1, 1985, to March 31, 1989.

Township of Springfield, Montgomery County - The relationship between the Township of Springfield and the City of Philadelphia is not defined in the standard long- or short-term agreements discussed above. Rather the wastewater relationship was established in an agreement in January 1947 and has been amended several times since. This is more of an evolving relationship with additional needs and conditions being addressed through revision of the original agreement. As the oldest standing relationship the City has with a municipality, some of the conditions are unique to Springfield. The original agreement and subsequent revisions are outlined here to establish a basic understanding of the wastewater relationship between these two neighbors:

Original Agreement, January 1947 - The original agreement establishes the need on the part of Springfield to dispose of wastewater from the Erdenheim and Cheltenham sections of the Township, and the capability and desire of Philadelphia to accommodate this need. This agreement predates the construction of the Southwest and Southeast WPCPs that currently accept this wastewater; therefore, this agreement provides for Philadelphia to convey and discharge the raw wastewater downstream of the Fairmount Water Works. This avoids the potential contamination of a portion of the City's water supply from Springfield's wastewater. The agreement also establishes the limits of flow, responsibilities to construct collection facilities, limits the service area within Springfield, and limits the types of wastewater that can be discharged into the Philadelphia collection system. Furthermore, Philadelphia agreed to reserve capacity in the proposed collection system improvements and WPCPs for continued service of Springfield's wastewater. Other conditions for access, metering, and payment are established as well as the standards for release from claims, successors, and assigns. One condition which is established in this agreement that is significantly different from the agreements with the other outlying municipalities/authorities is that of settlement of disputes. The other agreements include a standard for the establishment of an Arbitration Board to be formed that would settle any dispute between the City and the other party. The agreement with Springfield dictates that any disputes between the two participants be settled by the Philadelphia Director of Public Works. The term

of that agreement was 25 years with a required 5-year notice given by either party to terminate. The flow limits set at the time of the initial agreement were:

- 3.6 cfs maximum flow rate
- 1.6 mgd maximum daily flow

Revision No. 1, March 1955 - This revision reaffirms that most of the conditions of the January 1947 agreement remain in full effect. The primary changes to the original agreement include:

- A reduction in the original allocation of maximum daily flow from 1.6 mgd to 1.5 mgd at the original point of connection while reallocating the 0.1 mgd difference to another point of connection. This revision also includes an additional 0.2 cfs to the maximum flow rate. This additional flow originates in an area within Springfield Township adjacent to Norwood Avenue. With these revisions, this addendum results in the following flow limits:

  - 3.8 cfs maximum flow rate
  - 1.6 mgd maximum daily flow

- Springfield agreed to pay its *pro rata* share of the construction of the Southwest and Southeast WPCPs and associated facilities.

- Disputes between the two parties are to be resolved by the Philadelphia Water Commissioner.

- The revision reaffirms the termination date of the agreements to be January 1972 (25 years from the original agreement) with the additional proviso that it would continue unless terminated by either party by the conditions established in the original agreement.

Revision No. 2, March 1961 - This revision merely extends the area to be serviced by the Philadelphia wastewater facilities to include portions of Upper Dublin Township, Whitemarsh Township, and three sections of Cheltenham Township. The agreement does not allocate additional capacity to Springfield beyond what was already agreed to.

Revision No. 3, March 1967 - Further increases the service area within Upper Dublin Township.

Revision No. 4, March 1974 - Further expands the agreement service area to include the Arlington Section of the Township of Whitemarsh. Furthermore, the revision includes a variety of improvements to the collection system of Springfield and Philadelphia. This agreement also increases the allocation for Springfield to:

- 4.0 cfs maximum flow rate
- 2.15 mgd maximum daily flow

Revision No. 5, February 1989 - This revision expands the agreement service area to include 53 homes in the "Eagle View" development within Springfield. A 1986 agreement between Whitemarsh Township and Springfield Township increased the allowable flow rate from Whitemarsh, through the Andorra Gauging Station, to 0.28 mgd. Philadelphia is not a party to this agreement.

Amendments to the existing agreement between Philadelphia and Springfield have been ongoing are still pending.

Upper Darby Township - As with the Lower Southampton Municipal Authority Agreement, this long-term agreement between the City and Upper Darby closely follows the format established in the Bensalem agreement. The agreement with Upper Darby was executed in August 1988 and provides for a capital contribution from Upper Darby to the City for those wastewater facilities installed before July 1, 1985, and a similar payment for those facilities installed from July 1, 1985, to March 31, 1989.

3.2.3 Wastewater Flows, Loadings, and Fees

The specific flows and loadings defined in the intermunicipal agreements are germane to the planning efforts of this document since the City must abide by those limits and be prepared to supply these wastewater services for the foreseeable future. Likewise, cost of treatment, cost of disposal, repayment of bond obligations, etc., are all relevant to the amounts of flow that the PWD accepts from its neighboring municipalities/authorities. Philadelphia must provide adequate capacity, as detailed in these agreements, while ensuring that all parties are contributing equitably to the cost of operation of the wastewater system.

Tables 3.2.3 and 3.2.4 provide the relevant information needed to identify Philadelphia's short- and long-term obligations, rights, and charges. For planning purposes, the short-term agreements are assumed to continue since there is no indication that any of the municipalities/authorities are considering alternative treatment and disposal systems.

The actual flow and loadings (BOD_5 and Total Suspended Solids) have been tabulated for 1990 and 1991 to evaluate the compliance record of the 10 outlying municipalities with their respective agreements. Table 3.2.4 includes the tabulation and a comparison to the contractual amounts stipulated in the current agreements.

3.3 WASTEWATER MANAGEMENT AGENCIES

In addition to protecting the public health, safety, and welfare, the goal of a comprehensive sewage facilities plan is to protect the waters of the Commonwealth and prevent future sewage disposal problems. For this reason, it is necessary to consider all organizations that discharge wastewater within the planning area and their impact on projected future wastewater needs. For the purposes of this plan, those agencies that must be considered are the PWD, the contributing municipalities/authorities that discharge to the Philadelphia wastewater collection and treatment facilities, and those private (non-municipal) users within the City that have their own National Pollution Discharge Elimination System (NPDES) sewage permits.

TABLE 3.2.2

SUMMARY OF INTERMUNICIPAL AGREEMENTS

BCM

Municipal/Authority	Agreement Type	Agreement Last Amendment	Agreement Expiration Date	Agreement Status	Agreement Renewal Status	Flow Plant	Flow Maximum Annual Avg. (mgd)	Flow Maximum Daily Avg. (mgd)	Flow Maximum Instantaneous (cfs)	Annual Loadings BOD (K lb/day)	Annual Loadings S.S (K lb/day)
Abington	Short Term	1983	1990	Continuing	Negotiating	N.E.	4.453	--	9.25	*	*
Bensalem	Long Term	1988	2023	In Effect		N.E.	6.13	--	11.74	5,340	3,734
BCM&SA	Long Term	1988	2023	In Effect		N.E.					
Stage 1+							10.00	--	14.00	13,400	13,400
Stage 2++							20.00	--	62.00	--	--
Cheltenham	Short Term	1987	1992	Continuing	Negotiating	N.E.	13.38	--	20.75	*	*
DELCORA	Long Term	1974	2009	In Effect		S.W.	50.00	--	155.00	--	--
Lower Merion	Long Term	1992	2027	In Effect		S.W.	14.50	--	31.57	6,871	7,250
Lower Moreland	Long Term	1987	1994	In Effect`		N.E.					
Stage 1 (7/89-7/94)							0.50	1.216	3.84	174**	182**
Stage 2 (7/94-7/99)							0.80	1.756	5.44	305**	318**
Stage 3 (Post 1999)							1.00	2.056	5.94	392**	408**
Lower Southampton	Long Term	1988	2023	In Effect		N.E.	7.14	--	15.79	3,651	3,651
Springfield (Erdenheim)	Long Term	1989	1972	Continuing	Negotiating	S.W	2.25	--	4.20	--	--
Springfield (Wyndmoor)						S.E.	1.00	--	1.93	--	--
Upper Darby	Long Term	1988	2020	In Effect		S.W.	17.00	--	35.00	6,831	7,439

* - Capacity Charge; see next table.
** - Welsh Road Express sewer connection.
\+ - Preconstruction of Neshaminy Manor force main.
++ - Post construction of Neshaminy Manor force main (current limits).

BCM

TABLE 3.2.3

CONTRIBUTING MUNICIPALITY CHARGES (AS OF 10-1-90)

Municipality/ Authority	Capital Contributions		Annual Lump Sum	Volume Charge (per Mcf)	Capacity Charge (cfs)	S.S. Charge (per Klb)	BOD Charge (per Klb)	Exceedance Charges		
	Net Cost*	Pro Rata Cost**						Flow (per 100,000 gal)	S.S. (per Klb)	BOD (per Klb)
Abington	---	---	$312,000	$0.5227	$5,640	$109.00	$110.94	---	---	---
Bensalem	$4,400,000	$153,320	$33,000	$0.5227	$5,640	$109.00	$110.94	$3,700	$480	$900
Bucks County	$11,900,000	$373,000	$28,000	$0.5227	$5,640	$109.00	$110.94	$3,700	$480	$900
Cheltenham (current provisos)	---	---	$626,000	$0.4651	$3,031	$109.00	$110.94	---	---	---
DELCORA			-0-	$0.5434	$2,893	$189.49	$139.91			
Lower Merion Neill Drive P.S.	$6,463,000	$205,000	$44,000	$0.5494	$2,914	$191.05	$140.22	$3,700	$480	$900
	---	$314,704		$1.1603	$5,778	$191.05	$140.22	---	---	---
Lower Moreland	---	---	$73,000	$0.5227	$5,640	$190.00	110.94	$3,800	$50	$96
Lower Southampton	$4,646,000	$277,820	$35,000	$0.5227	$5,640	109.00	$110.94	$3,700	$480	$900
Springfield										
(Erdheim)	---	---	169,000	0.7119	$4,175	$191.05	$140.22	---	---	---
(Wynmoor)	---	---	$91,000	$0.7144	$5,673	$226.98	$79.82			
Upper Darby	$5,356,000	$144,120	$19,000	$0.5494	$2,914	$191.05	$140.22	$3,700	$480	$900

*Net cost to City for wastewater facilities, systems and equipment completed prior to agreement date.
**Cost for wastewater facilities, systems, and equipment allocated to service of municipality after agreement date.

TABLE 3.2.4

CONTRIBUTING MUNICIPALITY
COMPLIANCE COMPARISON FOR FLOWS, LOADINGS & AGREEMENTS

Township		Flow			Suspended Solids			Biological Oxygen Demand			
		Total Annual Volume (mg)	Average Daily Flow (mgd)	Agreement (mgd)	Annual Total (Klb)	Average Daily Load (Klb/day)	Agreement (Klbs/year)	Annual Total (Klb)	Average Daily Load (Klb/day)	Agreement (Klbs/year)	Compliance
Abington											
	1990	279.15	0.76	4.45	428	1.17	Cap. Chg.	371	1.02	Cap. Chg.	Yes
	1991	257.68	0.71	4.45	395	1.08	Cap. Chg.	344	0.94	Cap. Chg.	Yes
Bensalem											
	1990	1,415.62	3.88	6.13	2,554	7.00	3,734	3,146	8.62	5,340	Yes
	1991	1,330.55	3.65	6.13	3,169	8.68	3,734	3,661	10.03	5,340	Yes
Bucks Co. Water & Sewer Authority											
	1990	5,975.18	16.37	20.00	8,086	22.15	13,400	8,485	23.25	13,400	Yes
	1991	5,949.28	16.30	20.00	7,692	21.07	13,400	7,411	20.30	13,400	Yes
Cheltenham											
	1990	2,271.87	6.22	13.38	2,510	6.88		2,203	6.04		Yes
	1991	2,440.18	6.69	13.38	2,681	7.35		2,360	6.47		Yes
DELCORA											
	1990	15,183.97	41.60	50.00	14,357	39.34		11,693	32.04		Yes
	1991	14,732.06	40.36	50.00	15,658	42.90		12,461	34.14		Yes
Lower Merion											
	1990	3,296.02	9.03	14.50	4,060	11.12		3,569	9.78		Yes
	1991	3,262.89	8.94	14.50	4,873	13.35		3,857	10.57		Yes

TABLE 3.2.4 (Continued)

Township	Flow			Suspended Solids			Biological Oxygen Demand			
	Total Annual Volume (mg)	Average Daily Flow (mgd)	Agreement (mgd)	Annual Total (Klb)	Average Daily Load (Klb/day)	Agreement (Klbs/year)	Annual Total (Klb)	Average Daily Load (Klb/day)	Agreement (Klbs/year)	Compliance
Lower Moreland										
1990	140.96	0.39	0.80	252	0.69	318	211	0.58	305	Yes
1991	228.97	0.63	0.80	448	1.23	318	363	0.99	305	No
Lower Southampton										
1990	1,629.80	4.47	7.14	2,008	5.50	3,651	1,641	4.50	3,651	Yes
1991	1,405.98	3.85	7.14	1,908	5.23	3,651	1,521	4.17	3,651	Yes
Springfield (Erdenheim)										
1990	862.19	2.36	2.25	882	2.42		782	2.14		No
1991	892.88	2.45	2.25	915	2.51		810	2.22		No
Springfield (Wyndmoor)										
1990	314.80	0.86	1.00	209	0.57		166	0.45		Yes
1991	301.35	0.83	1.00	201	0.55		160	0.44		Yes
Upper Darby										
1990	4,332.96	11.87	17.00	4,675	12.81	7,439	4,488	12.29	6,831	Yes
1991	5,345.66	14.65	17.00	9,544	26.15	7,439	6,986	19.14	6,831	No
Grand Totals										
1990	**35,702.52**	**97.82**		**40,021**	**109.65**		**36,754**	**100.70**		
1991	**36,147.48**	**99.03**		**47,483**	**130.09**		**39,933**	**109.40**		

3.3.1 Philadelphia Water Department

As discussed in Section 2.4.4, the Home Rule Charter authorizes the Philadelphia Water Department to operate the Philadelphia water supply and wastewater collection, treatment, and disposal systems with responsibilities including maintenance, repair, upgrade, expansion, and regulation of user rates. PWD supplies water to the City and a portion of Bucks County, a population comprised of approximately 1.74 million people, and wastewater services to the City and to 10 outlying municipalities/authorities in Montgomery, Delaware, and Bucks Counties, a population of approximately 2.29 million people. The current condition, use, and maintenance of the two systems operated by the PWD is good. Furthermore, the current management of PWD is attentive to the need for preserving, modifying, and expanding the facilities as required to service its customers in such a way as to comply with current environmental regulations.

The PWD is managed by a Commissioner appointed by the Managing Director of the City with the approval of the Mayor. The Commissioner appoints two deputies with the approval of the Managing Director. All other employees of PWD are appointed under provisions of the City's Civil Service Regulations. The senior management of PWD also includes the General Manager of the Administration and Human Resources Division, the General Manager of the Public Affairs Division, and the Divisional Deputy City Solicitor, Water and Utilities.

Other City Departments have responsibilities involving PWD. The Department of Revenue performs all functions relating to meter reading, customer accounts, and collections through the Water Revenue Bureau. The Director of Finance has overall responsibility for fiscal administration as chief financial, accounting, and budget officer of the City, and the City's Law Department handles all legal matters affecting PWD.

As of this writing, of the approximately 2,287 persons employed by PWD, 167 are upper management, supervisory, and senior engineering and administrative personnel. The Water Revenue Bureau of the Revenue Department employs approximately 464 persons whose positions are funded by PWD.

3.3.2 Contributing Municipalities/Authorities

Besides Philadelphia, ten municipalities and authorities gain their wastewater service through the Philadelphia wastewater system. Each of these organizations has its own priorities, needs, and plans, which are memorialized in their respective intermunicipal agreements with the City. The evaluation of the Philadelphia wastewater system and its needs are based on these agreements which were discussed in Section 3.2, Contributing Municipalities/Authorities.

3.3.3 Industrial Dischargers with Individual NPDES Permits

Within the City limits, there are more than 30 industrial users who treat their own process wastewater and, in some cases, sanitary wastewater and have been issued NPDES permits by PADER. These users discharge into the Delaware and Schuylkill Rivers; Frankford, Pennypack, and Mingo Creeks, and Walton Run. During 1992, there were no enforcement actions taken

against any of these dischargers. A complete list of these users including NPDES permit numbers is contained in Appendix C.

3.4 EXISTING DEMOGRAPHICS, LAND USE, WASTEWATER FLOWS AND LOADINGS

This section will review demographic changes in the City's population from 1980 to 1990. Current population, land use, wastewater flows and loadings will also be the focus of this review. To facilitate both the review of existing data and the discussion of future conditions (Section 5.0), the City has been divided into 12 planning analysis sections as follows:

A - Center City
B - South Philadelphia
C - Southwest Philadelphia
D - West Philadelphia
E - Lower North Philadelphia
F - Upper North Philadelphia
G - Bridesburg/Kensington/Richmond
H - Roxborough/Manayunk
I - Germantown/Chestnut Hill
J - Olney/Oak Lane
K - Near Northeast Philadelphia
L - Far Northeast Philadelphia

These planning analysis sections are the same as those developed and used by the City Planning Commission and are delineated in Figure 3.4-1, Planning Analysis Sections.

Generally speaking, the following planning analysis sections are contained within the Southeast Water Pollution Control Plant Service Area: A - the eastern portion of Center City; B - the eastern portion of South Philadelphia; E - the majority of lower North Philadelphia; F - the majority of upper North Philadelphia; G - the majority of Bridesburg/Kensington/ Richmond; and the central portion of I - Germantown/Chestnut Hill.

The Southwest Water Pollution Control Plant Service Area includes these planning analysis sections: A - the western portion of Center City; B the western portion of South Philadelphia; C - Southwest Philadelphia; D - West Philadelphia; the western portion of F - Upper North Philadelphia; H - Roxborough/Manayunk; and the northwest and southeast portions of I - Germantown/Chestnut Hill.

The Northeast Water Pollution Control Plant Service Area includes: J - Olney/Oak Lane; K - Near Northeast Philadelphia; L - Far Northeast Philadelphia.

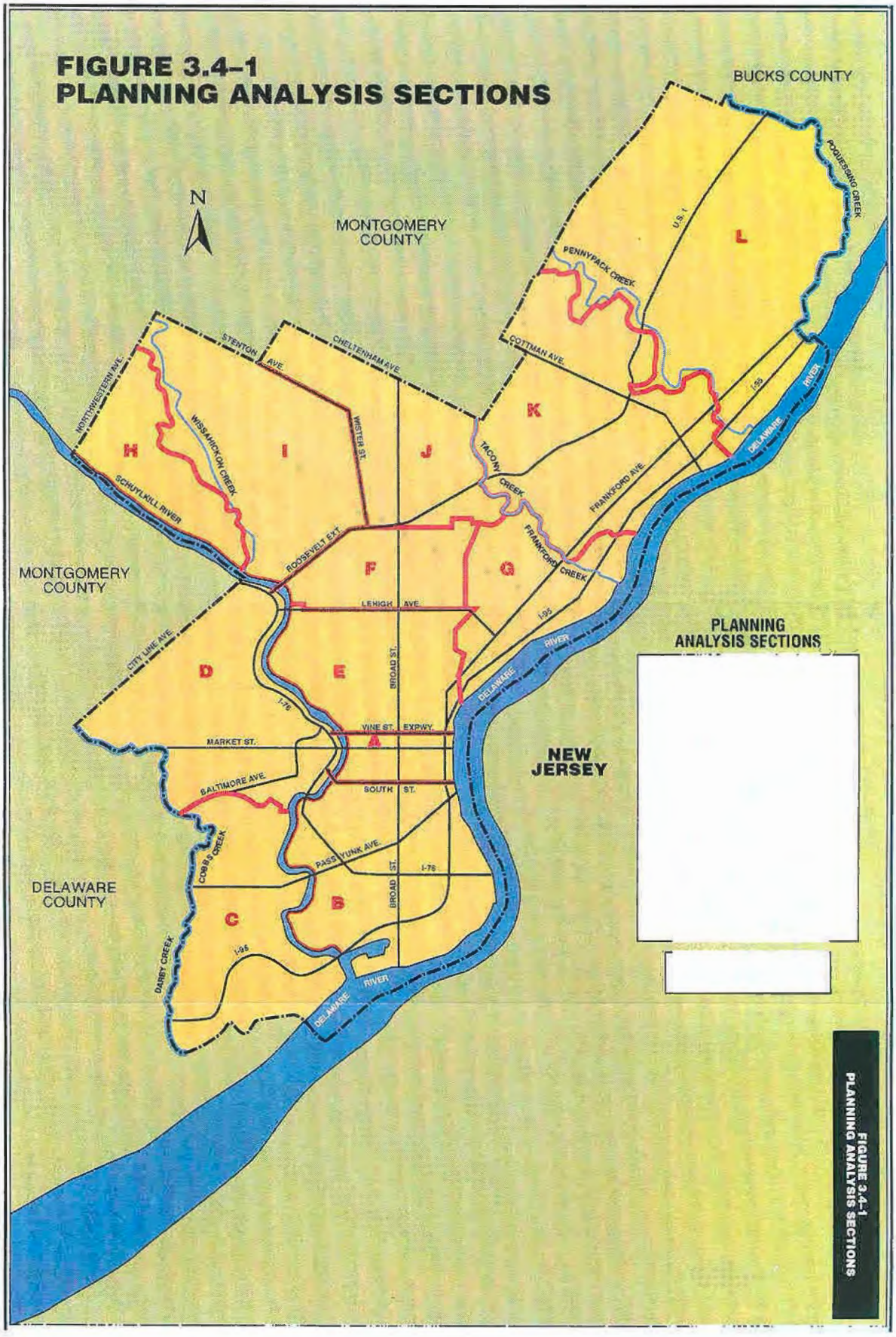
FIGURE 3.4–1
PLANNING ANALYSIS SECTIONS
BUCKS COUNTY
MONTGOMERY COUNTY
MONTGOMERY COUNTY
DELAWARE COUNTY
NEW JERSEY
N
A
B
C
D
E
F
G
H
I
J
K
L
STENTON AVE.
CHELTENHAM AVE.
NORTHWESTERN AVE.
WISSAHICKON CREEK
WISTER ST.
SCHUYLKILL RIVER
ROOSEVELT EXT.
LEHIGH AVE.
CITY LINE AVE.
I-76
BROAD ST.
VINE ST. EXPWY.
MARKET ST.
BALTIMORE AVE.
SOUTH ST.
PASSYUNK AVE.
COBBS CREEK
DARBY CREEK
I-95
DELAWARE RIVER
TACONY CREEK
FRANKFORD CREEK
FRANKFORD AVE.
COTTMAN AVE.
PENNYPACK CREEK
U.S. 1
POQUESSING CREEK
PLANNING ANALYSIS SECTIONS
FIGURE 3.4-1
PLANNING ANALYSIS SECTIONS

In this section, existing population data, land use data, and wastewater flows will be summarized for each of the 12 planning analysis sections and each of the water pollution control plant service areas.

The following sections rely on complete documentation of population, land use and housing data by census tract, planning analysis section and treatment plant service area for 1980, 1990 and 1996 as provided in Appendix D.

3.4.1 Existing Population and Trends

According to the U.S. Census, the City of Philadelphia experienced a decline in population from 1980 to 1990. In 1980, the population was 1,688,210 persons. In 1990, the population was 1,585,577, a decline of 6.1 percent. Population density also declined from 19.5 persons per acre to 18.3 persons per acre.

With the exception of the Center City Planning Analysis Section (A), every other section of the County experienced a decrease in population and a decrease in population density. Figure 3.4-2 Population Growth and Decline Areas 1980-1990 graphically indicates the location of these areas.

Table 3.4.1 summarizes the population trends from 1980 to 1990 for each of the 12 planning analysis sections. Lower North Philadelphia (E) experienced the greatest population decline (-14.1%) and the Far Northeast (L) experienced the least population decline (-1.7%). In contrast, Center City (A), the only section to grow in this period, experienced an increase (4.8%) in population. The Near Northeast (K) is physically the most populated planning analysis section in the City with 237,251 persons living within its boundaries.

Corresponding decreases in population density occurred from 1980 to 1990. In 1980, Lower North Philadelphia (E) was the most densely populated section, followed closely by Olney/Oak Lane. In 1990, Olney/Oak Lane (J), surpassed Lower North Philadelphia (E) as the most densely populated section of the City. Population density increased in the Center City (A) section from 27.3 persons per acre to 28.6 persons per acre. The Center City (A) section is the smallest, and had the most densely populated census tracts within the City in 1990. Figure 3.4-3, Population Density 1990, graphically shows the population density within the City in 1990.

Table 3.4.2 shows the compilation of the City population served by each of the three Water Pollution Control Plant Service areas based upon 1980 and 1990 census figures. The Northeast WPCP serves a total City population of 760,451 persons. The population in this service area declined by 35,134 persons from 1980 to 1990 (-4.4%). The Northeast WPCP serves the largest population (760,451 persons) and the largest area (approximately 42,959 acres) in the City. The Southeast WPCP serves a total City population of 338,873 persons and also experienced a population decline from 1980 to 1990 (-9.1%). The Southeast WPCP serves an area of approximately 15,203 acres. The Southwest WPCP serves a total City population of 486,253 persons over an area of 28,322 acres, which represents a decrease of 33,449 persons (-6.4%) from 1980.

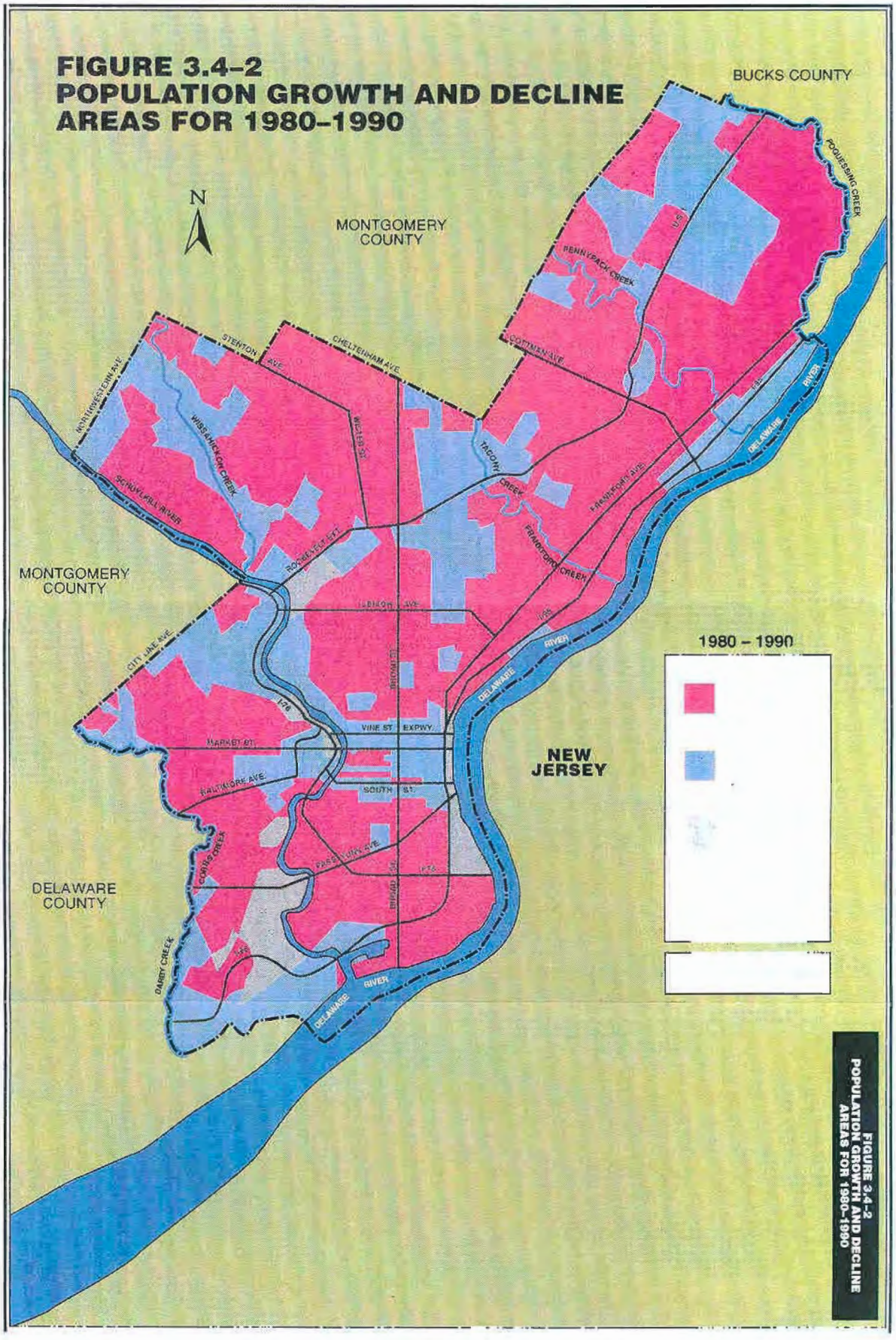
FIGURE 3.4-2
POPULATION GROWTH AND DECLINE
AREAS FOR 1980–1990
N
BUCKS COUNTY
MONTGOMERY
COUNTY
MONTGOMERY
COUNTY
DELAWARE
COUNTY
NEW
JERSEY
1980 – 1990
PENNYPACK CREEK
POQUESSING CREEK
STENTON AVE.
CHELTENHAM AVE.
COTTMAN AVE.
NORTHWESTERN AVE.
WISSAHICKON CREEK
SCHUYLKILL RIVER
MILLER ST.
TACONY CREEK
FRANKFORD AVE.
FRANKFORD CREEK
ROOSEVELT EXT.
ERDMAN AVE.
CITY LINE AVE.
I-676
BROAD ST.
VINE ST. EXPWY.
MARKET ST.
BALTIMORE AVE.
SOUTH ST.
PASSYUNK AVE.
CRUM CREEK
DARBY CREEK
DELAWARE RIVER
FIGURE 3.4-2
POPULATION GROWTH AND DECLINE
AREAS FOR 1980–1990

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TABLE 3.4.1

POPULATION TRENDS BY PLANNING SECTION
CITY OF PHILADELPHIA 1980 - 1990

TOTAL POPULATION AND DENSITY

Planning Analysis Section	1980 Total Population	1990 Total Population	Percent Change 80 - 90	Total Acreage	1980 Persons per Acre	1990 Persons per Acre
A	43,552	45,645	4.8	1,594	27.3	28.6
B	188,318	170,944	-9.2	8,691	21.7	19.7
C	86,328	81,885	-5.1	7,023	12.3	11.7
D	232,979	219,713	-5.7	8,888	26.2	24.7
E	170,611	146,491	-14.1	5,104	33.4	28.7
F	113,693	106,045	-6.7	3,827	29.7	27.7
G	100,865	94,715	-6.1	5,030	20.1	18.8
H	45,440	45,525	-6.4	4,002	11.4	11.4
I	110,455	103,266	-6.5	8,367	13.2	12.3
J	184,039	176,550	-4.1	5,584	33.0	31.6
K	248,559	237,251	-4.5	11,352	21.9	20.9
L	163,371	160,547	-1.7	17,021	9.6	9.4
Total:	**1,688,210**	**1,588,577**	**-6.1**	**86,483**	**19.5**	**18.4**

Source: U.S. Department of Commerce, Bureau of the Census.
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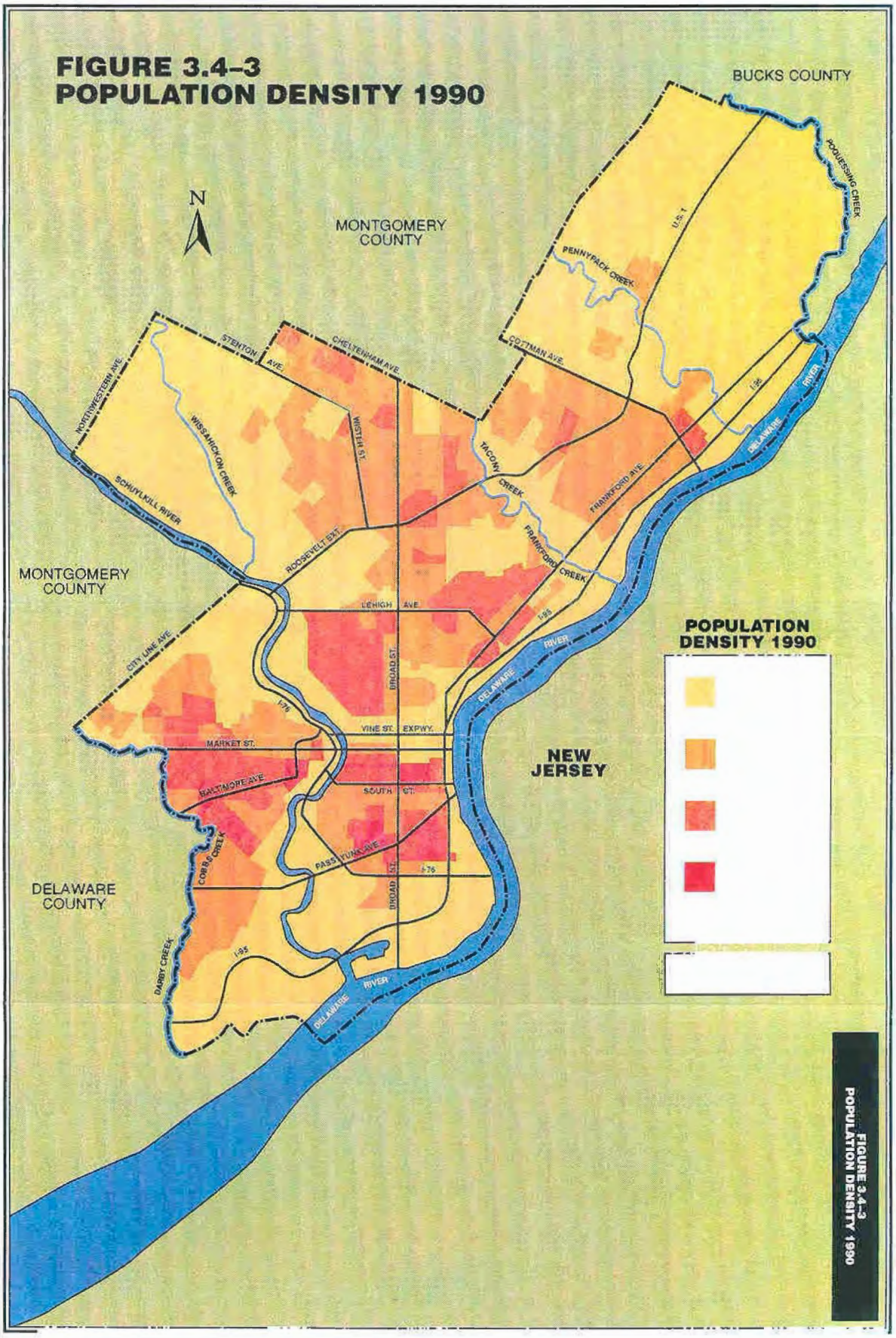
FIGURE 3.4–3
POPULATION DENSITY 1990
BUCKS COUNTY
MONTGOMERY COUNTY
MONTGOMERY COUNTY
DELAWARE COUNTY
NEW JERSEY
N
POQUESSING CREEK
PENNYPACK CREEK
U.S. 1
COTTMAN AVE.
CHELTENHAM AVE.
STENTON AVE.
NORTHWESTERN AVE.
WISSAHICKON CREEK
SCHUYLKILL RIVER
WISTER ST.
ROOSEVELT EXT.
TACONY CREEK
FRANKFORD AVE.
FRANKFORD CREEK
I-95
DELAWARE RIVER
LEHIGH AVE.
CITY LINE AVE.
BROAD ST.
I-676
VINE ST. EXPWY.
MARKET ST.
BALTIMORE AVE.
SOUTH ST.
PASSYUNK AVE.
COBBS CREEK
DARBY CREEK
POPULATION DENSITY 1990
FIGURE 3.4-3
POPULATION DENSITY 1990

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TABLE 3.4.2

POPULATION TRENDS BY WPCP SERVICE AREA

POPULATION AND DENSITY

WPCP Service Area	1980 Total Population	1990 Total Population	Percent Change 80 - 90	Service Area Acreage	1980 Persons Per Acre	1990 Persons Per Acre
NE	795,586	760,451	-4.4	42,959.3	18.5	17.7
SE	372,922	338,873	-9.1	15,202.6	24.5	22.3
SW	519,702	486,253	-6.4	28,321.8	18.3	17.2
	1,688,210	**1,585,577**	**-6.1**	**86,483.7**	**19.5**	**18.3**

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3.4.2 Existing Housing Trends

According to the U.S. Census, the City of Philadelphia experienced a modest decline (-1.5%) in the number of occupied dwelling units from 1980 to 1990. Table 3.4.3 summarizes the housing data by planning analysis section. Center City (A) and the Far Northeast (K) showed rather significant increases in the number of occupied dwelling units. Some 3,446 dwelling units were added in Center City and 5,981 were added in the Far Northeast from 1980 to 1990. Roxborough/Manayunk (H) and the Near Northeast (K) also posted modest increases.

The remaining eight planning analysis sections showed declines from 1980 to 1990. Upper (F) and Lower (E) North Philadelphia showed respective decreases of -10.1 percent and -8.3 percent, which is consistent with the decreases in population as noted in the previous section.

Table 3.4.4 shows that the area served by the Northeast WPCP experienced a decrease of just 232 dwelling units from 1980 to 1990. The area served by the Southeast WPCP showed a decrease of 5,566 dwelling units. The area served by the Southwest WPCP showed a decrease of 4,434 dwelling units.

One final statistic of interest is that the number of persons per dwelling unit in Center City (A) is significantly less than in other areas of the City. In 1990, the number of persons per dwelling unit in Center City was 1.3. The overall City average was 2.3 persons. Every planning district experienced decreases in dwelling unit density from 1980 to 1990 except Olney/Oak Lane (J), which remained constant (2.7 persons/dwelling unit), and Upper North Philadelphia (F), which increased from 2.6 persons/dwelling unit to 2.7 persons/dwelling unit.

3.4.3 Existing Land Use

As can be seen in Table 3.4.5 the City of Philadelphia encompasses 86,484 land acres. Land committed to residential use comprises the largest use category, totaling 36,961 acres (43%). A total of 25,942 acres of land is in institutional use (30%). Commercial land comprises 8,305 acres (9%), and vacant land totals 9,297 acres (11%). Industrial land accounts for 5,979 acres (7%).

The City's 12 planning analysis sections vary greatly in their land use composition. Table 3.4.5 characterizes land use for each of the 12 sections. It should be noted that much of the vacant land is comprised of environmentally sensitive areas such as wetlands and steep slopes and is undevelopable.

Table 3.4.6 provides a breakdown of the land use categories by wastewater treatment plant service areas. The land use of the planning analysis sections going to each WPCP is proportional to the land use of the total planning analysis section.

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TABLE 3.4.3

HOUSING TRENDS BY PLANNING ANALYSIS SECTION

CITY OF PHILADELPHIA 1980-1990

TOTAL HOUSING AND DENSITY/UNIT

Planning Analysis Section	1980 Total Housing Units	1990 Total Housing Units	Percent Change 80 - 90	1980 Housing Density Persons/ DU	1990 Housing Density Persons/ DU
A	30,370	33,816	11.3	1.4	1.3
B	78,522	74,987	-4.5	2.4	2.3
C	32,156	31,433	-2.2	2.7	2.6
D	97,226	94,940	-2.4	2.4	2.3
E	71,711	65,770	-8.3	2.4	2.2
F	43,855	39,406	-10.1	2.6	2.7
G	40,866	39,587	-3.2	2.5	2.4
H	18,247	19,430	6.5	2.5	2.2
I	48,224	46,851	-2.8	2.3	2.2
J	68,024	66,428	-2.3	2.7	2.7
K	99,929	100,289	0.4	2.5	2.4
L	55,981	61,962	10.7	2.9	2.6
Total	**685,131**	**674,899**	**-1.5**	**2.5**	**2.3**

Note: Complete tabulation by census tract provided in Appendix I.

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TABLE 3.4.4

HOUSING TRENDS BY WPCP SERVICE AREA

CITY OF PHILADELPHIA 1980 - 1990

WPCP Service Area	WPCP Service Area Acreage	1980 Total Housing Units	1990 Total Housing Units	Percent Change 80 - 90	1980 Housing Density Persons/ DU	1990 Housing Density Persons/ DU
NE	42,960	304,691	304,459	-0.1	2.6	2.5
SE	15,203	163,589	158,023	-3.4	2.3	2.1
SW	28,322	216,851	212,417	-2.0	2.4	2.3
Total	**86,484**	**685,131**	**674,899**	**-1.5**	**2.5**	**2.3**

Note: Complete tabulation by census tract provided in Appendix I.

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TABLE 3.4.5

PHILADELPHIA COUNTY LAND USE SUMMARY (ACRES)

Planning Analysis Section	Residential	Commercial	Industrial	Institutional	Vacant	Total
A	406	516	31	526	115	1,594
B	2,570	999	1,163	3,482	477	8,691
C	1,661	343	716	1,661	2,641	7,022
D	3,817	908	29	3,705	430	8,889
E	2,166	455	246	1,662	576	5,105
F	1,698	453	456	1,067	153	3,827
G	1,909	654	921	1,003	544	5,031
H	2,008	216	89	513	1,176	4,002
I	4,543	341	72	3,043	368	8,367
J	3,224	608	223	1,362	167	5,584
K	6,164	1,359	842	2,369	617	11,351
L	6,795	1,453	1,191	5,549	2,033	17,021
TOTAL	**36,961**	**8,305**	**5,979**	**25,942**	**9,297**	**86,484**

Sources: Land Use Maps, 1973 - 1981, Philadelphia Planning Commission
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TABLE 3.4.6

LAND USE BY WPCP SERVICE AREA (ACRES)

Northeast WPCP

Planning Analysis Section	Total Acreage	Residential	Commercial	Industrial	Institutional	Vacant
E	6	2	2	0	2	1
F	2,500	1,109	296	298	697	100
G	4,043	1,534	526	740	806	437
I	2,566	1,393	105	22	933	113
J	5,472	3,159	596	219	1,335	164
K	11,353	6,165	1,359	842	2,369	617
L	17,021	6,795	1,453	1,191	5,549	2,033
TOTAL	**42,960**	**20,157**	**4,336**	**3,312**	**11,691**	**3,464**

Southeast WPCP

Planning Analysis Section	Total Acreage	Residential	Commercial	Industrial	Institutional	Vacant
A	1,203	307	390	23	397	87
B	4,362	1,290	501	584	1,747	239
E	3,947	1,675	352	190	1,285	445
F	784	348	93	93	219	31
G	987	375	128	181	197	107
I	3,808	2,068	155	33	1,385	167
J	112	65	12	4	27	3
TOTAL	**15,203**	**6,126**	**1,631**	**1,109**	**5,257**	**1,081**

Southwest WPCP

Planning Analysis Section	Total Acreage	Residential	Commercial	Industrial	Institutional	Vacant
A	391	100	127	8	129	28
B	4,329	1,280	498	579	1,734	238
C	7,023	1,661	343	716	1,661	2,641
D	8,888	3,817	908	29	3,705	430
E	1,151	489	103	55	375	130
F	544	241	64	65	152	22
H	4,002	2,008	216	89	513	1,176
I	1,994	1,083	81	17	725	88
TOTAL	**28,322**	**10,678**	**2,339**	**1,558**	**8,994**	**4,752**

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Significant amounts of acreage are devoted to a number of large facilities. For example, the Philadelphia Naval Base, Philadelphia Naval Ship Yard, Veterans Stadium, and the Spectrum are located in Area B (South Philadelphia). Philadelphia International Airport is located in Area C (Southwest Philadelphia). The Northeast Airport, Holmesburg Prison, and Philadelphia State Hospital are located in Area L. Fairmount Park is located in Areas D (West Philadelphia), E (Lower North Philadelphia), I (Germantown/Chestnut Hill), F (Upper North Philadelphia, and H (Roxborough/Manayunk).

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4.0 EVALUATION OF EXISTING WASTEWATER FACILITIES

4.1 ON-LOT DISPOSAL SYSTEMS

Of the almost 675,000 residences in the City of Philadelphia, there are approximately 2450 with on-lot disposal systems (OLDS). These are individual onsite systems that do not discharge to the City's conveyance and treatment system. The greatest concentration of these systems is in the Roxborough/Manayunk, Germantown/Chestnut Hill, and Far Northeast sections, with others scattered throughout the City. The Philadelphia Department of Health (Health Department) is the agency that regulates OLDS and issues permits for new systems and repairs to existing malfunctioning systems.

Philadelphia has adopted regulations regarding OLDS from those of the Commonwealth of Pennsylvania as stated in Chapter 73 of Title 25 of the Rules and Regulations of the Pennsylvania Department of Environmental Resources (PADER). The regulations apply to all persons who wish to install individual or community sewage systems.

4.1.1 Identification of Areas with On-Lot Disposal Systems

In order to locate those areas with high densities of OLDS, the Water Revenue Bureau accounts for "water only" customers were reviewed and catalogued. It is assumed that users identified as "water only" do not discharge wastewater into the Philadelphia Water Department (PWD) collection and treatment system, and thereby utilize OLDS. In order to focus the discussion on areas of manageable size, those residences and streets without sewer accounts were plotted on a map of the City. The sections of the City that have significant OLDS densities have been grouped into seven areas, Areas A through G, and are delineated on Figure 4.1-1.

Philadelphia Health Department personnel were consulted to determine current policies and procedures in regard to new OLDS and handling complaints for failed systems. Health Department records for the last fifteen years were examined to locate areas where permits were issued for new OLDS and repairs to existing malfunctioning systems. This information was used to cross reference the "water only" account records to confirm the extent of on-lot disposal systems within the City. Table 4.1-1 catalogues the locations and other pertinent information about these seven areas. The remaining OLDS are scattered throughout the City. Appendix E includes the "water only" accounts, a list of streets in each section, new septic permit listings, and information on those properties with on-lot malfunctions.

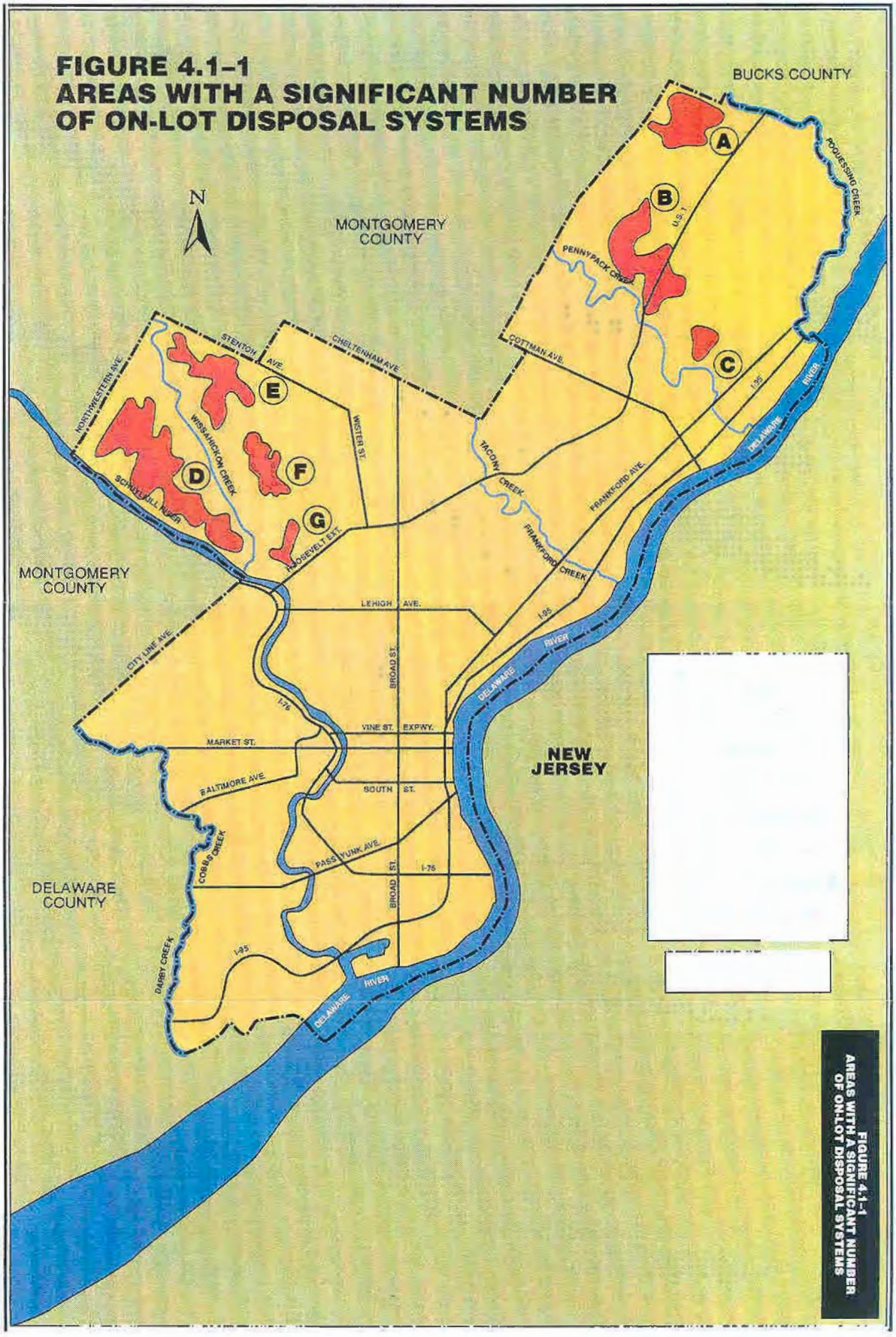

FIGURE 4.1-1
AREAS WITH A SIGNIFICANT NUMBER
OF ON-LOT DISPOSAL SYSTEMS

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TABLE 4.1.1

OLDS LOCATIONS

Area	Planning Section	Approximate No. of Accounts *	Problems
A	Far Northeast	140	1%
B	Far Northeast	60	5%
C	Far Northeast	<10	0
D	Roxborough/Manayunk	575	3%
E	Germantown/Chestnut Hill	310	5%
F	Germantown/Chestnut Hill	90	1%
G	Upper North Philadelphia	30	3%

*From "water only" account records.

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4.1.2 Evaluation of Suitability for On-Lot Disposal Systems

Soil is capable of treating organic materials, inorganic substances and pathogens in wastewater by acting as a filter, exchanger, adsorber, and a surface on which many chemical and biochemical processes may occur. The combination of these processes acting on wastewater as it passes through the soil produces a water of acceptable quality for discharge into the groundwater under proper conditions.

Physical entrapment of particulate matter in the wastewater may be responsible for much of the treatment provided by soil. This process is most effective when the soil is unsaturated. If saturated soil conditions prevail, the wastewater flows through the larger pores and receives minimal treatment. However, if the soil is unsaturated and the wastewater flow into the soil distributed, filtration is enhanced because the wastewater is forced to flow through the smaller pores of the soil.

Numerous studies have shown that 2 feet to 4 feet (0.6 to 1.2 meters) of unsaturated soil is sufficient to remove bacteria and viruses and nearly all phosphorus to acceptable levels. The needed depth is determined by the permeability of the soil. Soils with high permeabilities may require greater unsaturated depths below the infiltrative surface than soils with low permeabilities.

Maximizing the use of OLDS under appropriate conditions is an environmentally sound treatment alternative. In those areas of appropriate subsurface and hydrological conditions, on-lot disposal provides an acceptable degree of treatment, helps maintain base flow in surface streams, and recharges aquifers. In many cases it is the most cost-effective means of sewage treatment/disposal. This method of sewage disposal is recommended whenever housing densities are low and conducive geologic and/or soil conditions exist.

Some of the factors that govern whether an area is suitable for on-lot systems include soils, geology, housing density, groundwater levels, and accessibility to public sewers. Even though an area has soils suitable for OLDS, soil tests are necessary to verify soil type, to ascertain soil porosity and percolation rates, and to analyze other site factors. Bedrock characteristics, for example, may affect natural groundwater quality. Furthermore, groundwater quality will eventually affect surface water quality as the water percolates into surface streams. The groundwater must be of sufficient depth below ground level to allow the wastewater to receive treatment as it percolates through the soil. If the groundwater is too high, the wastewater will receive inadequate treatment by the soil system. Accordingly, groundwater levels and other limiting conditions must be considered in evaluating suitability of sites for OLDS.

4.1.2.1 Soil Suitability

PADER has categorized the soil series mapped by the U.S. Soil Conservation Service for the Philadelphia area based on limitations for subsurface disposal of effluent. The soils are grouped by probable percolation rates, flood hazard, seasonal water table, shallowness, or special pollution hazards and may be classified into three general categories based on their suitability for OLDS:

1. "Suitable" soils are generally suitable for conventional soil treatment and disposal with subsurface absorption areas, depending on the percolation rate at the specific site.

2. "Marginal" soils are generally unsuitable for conventional systems, but may be suitable for alternative subsurface absorption areas, such as elevated sand mounds.

3. "Unsuitable" soils cannot be used for conventional or alternative OLDS.

The soil series that are found in Philadelphia were discussed in Section 3.1.2. The soils of the areas of the City that have high densities of OLDS are presented in Table 4.1.2, and show suitability for OLDS as categorized by PADER group, suitability, and percolation rate.

The greatest percentage of the soil in Areas A - G is Urban land, Chester complex with 0% - 8% slope. The next most predominant soil type in these areas is Urban land, Chester complex with 8% - 15% slope. There are small sections of Manor loam, Rowland silt loam, and Hatboro silt loam in these areas, but as can be seen from Table 4.1.2, these soil types are generally not well suited to on-lot systems.

Of the various soils series, Urban Land is by far the predominant type in the areas where OLDS are located, indeed, in the entire City. This type of soil has variable characteristics, including percolation rates, and is generally unsuitable for OLDS. However, prospective OLDS sites must be assessed individually to determine suitability.

4.1.2.2 Housing Density Considerations

Although the soils in a particular area may be adequate for on-lot systems, the capacity of the soil to absorb wastewater may be overtaxed if development in the area is too dense. Generally, in places where lots are two acres or larger with individual wells, OLDS have a minimal impact on the surrounding area. This is also true for one-acre lots, but it may be difficult to locate replacement locations for failing systems and still maintain adequate isolation distances from wells, structures, property lines, and other site features. In areas with one-half acre lots, OLDS generally should only be considered if public water is provided.

4.1.2.3 Alternative On-Lot Disposal Methods

In areas where the use of conventional septic systems is not recommended, an elevated sand mound or other alternative or experimental subsurface disposal system may be feasible. These alternatives provide various methods of on-lot disposal that may solve the problems created by soil limitations due to permeability, high seasonal water table, and bedrock characteristics. Generally, the alternative subsurface disposal system is designed to create a more suitable disposal field or a higher quality effluent, as is the case when using an aerobic treatment tank rather than a conventional septic tank.

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TABLE 4.1.2

SOIL SUITABILITY FOR OLDS

Soil Series	PADER Group	Description	Percolation Rate	Suitability
Hatboro	13	High flood hazard		Unsuitable
Manor	3	Mod. Deep, well drained	1" in 6-15 min	Suitable
Rowland	13	High flood hazard		Unsuitable
Urban Land			Variable	Unsuitable

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The currently approved and most predominant alternative on-lot system is the elevated sand mound, which can be considered in the following cases:

1. To solve an existing pollution or public health problem.

2. To overcome specific site suitability deficiencies, or as a substitute for systems on suitable lots.

3. To overcome specific engineering problems related to the site or its proposed use.

4. To utilize, under varying site conditions, an experimental design, either in whole or in part, that has been deemed successful by PADER.

When evaluating alternative on-lot systems, PADER requires that the following criteria be considered:

- Chemical and bacteriological characteristics of flow
- Materials of construction
- Volume and rate of sewage flow
- Characteristics and limitations of disposal site
- Design of absorption area
- Effect upon groundwater
- Other considerations as appropriate to comply with Act 537

4.1.2.4 Experimental On-Lot Disposal Methods

Current regulations also govern experimental on-lot disposal methods. These may be considered in any cases where elevated sand mounds are suitable and for the following purposes:

1. To evaluate new concepts or technology applicable to on-lot disposal.

2. To evaluate the applicability to on-lot disposal of established concepts or technologies having successful use in comparable applications in the field of engineering.

3. To demonstrate a design having successful use in other jurisdictions under environmental conditions similar to or more restrictive than those of the Commonwealth.

4. To utilize under varying site conditions, an experimental design, either in whole or in part, that has been deemed successful by PADER.

When properly designed, alternative and experimental on-lot systems are effective; however, they have two disadvantages. First, the design and construction costs are higher than conventional methods. Second, they may be considered aesthetically unacceptable due to their visibility or unusual appearance. The use of alternative and experimental on-lot systems is provided for in the January 22, 1983, revision of Chapter 73 of Title 25 of the Rules and Regulations of PADER.

The same evaluating criteria apply to experimental systems as to alternative systems. Other than elevated sand mounds, all alternative and experimental on-lot systems must receive approval from PADER and the Philadelphia Health Department.

4.1.3 On-Lot Disposal System Regulations

The Philadelphia regulations regarding OLDS adopted from those of the Commonwealth of Pennsylvania as stated in Chapter 73 of Title 25 of the Rules and Regulations of PADER apply to all persons who wish to install individual or community sewage systems.

The Commonwealth standards for septic tanks govern both capacity and construction. The minimum liquid capacity for any tank is 900 gallons. For single family dwellings, a minimum flow of 400 gpd must be used to determine tank capacity, with an additional 100 gallons for each bedroom over three. Construction specifications mandated by Chapter 73 address materials, wall thickness, covers, foundations, building standards, depths, inlet and outlet connections, treatment tank access, and inspections. The regulations include general site location and absorption area requirements, building sewers, treatment tanks, dosing and distribution requirements, construction of absorption areas, retaining tanks, and alternative systems.

4.1.3.1 Plumbing Regulations

The City ordinances governing septic systems which were a part of the Plumbing Code administered by the Philadelphia Department of Licenses and Inspections were rescinded in 1975 when they were superseded by PADER regulations. They regulated types of materials used, trenches, percolation tests, and loose wells (see page pits). Appendix E contains a copy of the regulations pertaining to septic systems. A summary has been included herein for informational purposes. Approximately 99 percent of the existing OLDS in the city were constructed in accordance with these regulations.

The materials section of the Plumbing Code covers pipes, field tiles, joints, and grading. Distribution pipes must be bell and spigot type of vitrified clay with water-tight joints. Pipes under driveways and other areas subject to heavy loads must be bell and spigot cast iron with leaded joints. Field tiles must be not less than 4 inches in diameter and shall be laid with 1/4-inch open joints. No cinders or ashes may be used for the field tile bed. This section of the Code also regulates open-joint protection, grade boards, and other grading requirements.

The regulations regarding trenches state that no disposal trench may be constructed in filled ground except by approval of the Health Department. The Plumbing Code sets criteria for determining seepage area as well as requirements for size and spacing of disposal trenches. There are certain standards for lines, including minimum number per field and maximum length. Depth

of cover and grade for tile lines is stipulated, as well as depth of filter material both under and over the tiles. A minimum of 150 square feet of effective absorption area (100 lineal feet) of 18-inch trench must be provided per dwelling unit.

Loose wells (seepage pits), although not an acceptable design for new installations, were regulated as to size, capacity, materials and location. They cannot be less than four feet inside diameter and must be provided with 18 inches of cover. The depth of the loose well is determined by the soil characteristics, but must be no less than ten feet below the inlet pipe. Other requirements include types of materials used for walls, wall thickness, depth of gravel or crushed stone to be used in the bottom, and location. Walls must be watertight to a depth of five feet below the ground surface. The distance between two loose wells shall be not less than ten feet.

The distance from the building to the septic tank must be not less than 10 feet, and from the building to the loose well, not less than 25 feet. There must be 10 feet between the septic tank and the loose well. The septic tank must have an 18-inch manhole and an inspection opening.

In evaluating malfunctioning existing OLDS in accordance with these regulations, the Health Department evaluates the repair of individual components as well as their impact upon public health and the environment.

4.1.3.2 Typical On-Lot Disposal System

The most common construction of septic systems within the City, due to the age of the OLDS systems, consists of a septic tank (tight well) and a seepage pit (loose well). Historically, the loose well was created by excavating the bedrock to a shallow depth and using explosives to break up the rock sufficiently to allow percolation directly into the rock strata. This procedure caused the rock to fragment, resulting in seepage paths directly into the groundwater. This method of construction was prohibited in 1975 having been replaced with septic tank and tile field systems as defined by PADER regulations.

4.1.4 Septage Management

Septic systems require periodic maintenance, which includes pumping of the accumulated scum and sludge septage. Recent EPA studies indicate that septage buildup ranges from 60 to 70 gallons per capita per year in well functioning septic systems. The required frequency of septic tank pumping ranges from 3 to 5 years. If septic tanks are not maintained, septage may overflow into the subsurface absorption area resulting in the discharge of raw sewage either into the dwelling or onto the ground surface and into the waters of the commonwealth.

Haulers transport and discharge septic tank waste into the PWD sewer system or treatment plants for disposal. Septage is anaerobic and presents problems at water pollution control plants (WPCPs) if handled in substantial quantities; however, this is not a significant concern for PWD, since the City's WPCPs are so large. The Philadelphia Health Department is responsible for responding to complaints, investigating and issuing orders for correction of malfunctioning OLDS. Septage Management is enforced by PWD and the Department of Licenses and Inspections.

4.1.5 Sewer Extensions

PWD has no established plans for extending the sewer service into Areas A through G because of the prohibitive costs. In the past, at Health Department request, the PWD has designed and extended sewers on Alton Street, Stratford Drive, Mechanicsville Road and Pennypack Street, where unsanitary conditions created by malfunctioning OLDS could not be corrected by other means. The Capital Improvement Plan for the next five years provides a limited budget for extension of the collection system. There is a potential for extensions into one or two streets in areas that have on-lot systems, but this would be on an as-needed basis and under special circumstances. Dearnley Park, in the Roxborough section, is one area for potential expansion. However, there have been few reported occurrences of malfunctions, and extension of the sewer system there is unlikely in the near future. Another area of dense OLDS is Chestnut Hill, but residents in that section are not likely to petition the City for sewer service. Many of the properties there are large, and either have ample space for replacement sewage systems or have on-lot systems that are operating satisfactorily and are acceptable to the owners. In most cases, the cost factor is prohibitive and would often require pumping stations or ejectors. The PWD is currently in the process of designing a collector system for the 9600 block of Banes and Barnes Streets and 1700 block of Fulmer Street, to eliminate the improper discharge of sewage from numerous homes into the street.

The installation of sewers in any new developments in these areas would be assumed by the developer.

4.2 WASTEWATER COLLECTION SYSTEM

The origins of the City of Philadelphia wastewater collection system date back to colonial times when drains, often hollowed trees, were installed to alleviate stormwater runoff, drain wetlands, and lower the groundwater to accommodate growth in the young city. The system soon became to be utilized to carry domestic waste, relieving the obnoxious conditions caused by stockpiling human and animal waste, which was the standard practice at the time. With the installation of water closets in City homes, house connections were made to the drains and larger extensions were added to accommodate the continually increasing demand to transport wastewater to the Schuylkill and Delaware Rivers. By 1854, there were 38 miles of sewers in service to meet the needs of the City. These drains/sewers were a convenient and inexpensive method of disposing of waste; however, they only transferred the associated nuisance and pollution problems from the residences and streets to the City's waterways.

The practice of relying on one system of sewers to convey both storm and wastewater in the 1800s and early 1900s has evolved into the modern combined sewer system that currently still services 60% of the sewered areas of the City. The remaining portion of the City has separate sewers for storm and wastewater, which is more typical of recent development. The combined sewer system relies on interceptor conduits sized to convey the wastewater flows to the treatment plants and regulator chambers that divert heavier stormwater flows from trunk sewers directly into adjacent surface waters. Conceptually, the system allows for the collection of all dry weather

wastewater flows and the first flush of stormwater runoff to the water pollution control plants for treatment. The wet weather flow, which is discharged directly into the adjacent surface waters with the stormwater runoff, would be diluted, presumably mitigating the effect on the water quality of the receiving waters.

Today, the total sewer system of the City is comprised of 2,955 miles of sewers and storm drains with more than 730 miles installed since the 1950s. A complete and comprehensive evaluation of almost 3,000 miles of sewers is beyond the scope of this report; however, an adequate understanding and evaluation of the collection system is essential to meeting the goals of this planning document and the Philadelphia wastewater collection and treatment system. The discussion and evaluation of the collection system included in this report will concentrate on the collection system's interceptors, pumping stations, and combined sewer operation and maintenance.

Interceptors are defined herein as larger sewer lines that do not normally have laterals connected to individual customers; rather their purpose is to convey large amounts of flow from remote areas to the water pollution control plants. Furthermore, the interceptors can be for either combined or separate systems. The construction and proliferation of the interceptor sewer system is a result of the City's efforts to protect its own water supply. As early as 1883, the City began construction of an intercepting sewer along the east bank of the Schuylkill River from below the Fairmount Dam to Manayunk, some six and a half miles in length. This interceptor transported wastewater from smaller sewers in Germantown, Chestnut Hill, Manayunk and Roxborough to downstream of the Fairmount Water Works, which supplied 50% of the City's potable water at the time. The frequency of having the City's water supply contaminated by its own sewage was greatly reduced by diverting the localized wastewater around the Water Works. By the turn of the century, with increasing population and industrial facilities, demand rose for a solution to the degradation of the Schuylkill and Delaware Rivers, which were plagued by offensive odors and a continued threat to public health. This situation resulted in the development of a long-term plan for wastewater treatment in 1912, the construction of the Northeast Sewage Treatment Works in 1923, and eventually the evolution of the three primary water pollution control plants in the early 1950s. The utilization of these large regional plants prompted the extension of the major intercepting sewers to collect wastewater from remote areas. As such, it is not surprising that the periods of major interceptor construction coincide with the construction of treatment plants in the early 1920s and 1950s.

4.2.1 Overview

The City's wastewater collection system includes the following components:

Separate Sanitary Sewer Collectors	585 miles
Separate Storm Sewer	620 miles
Combined Sewer Collectors	1,595 miles
Interceptors	135 miles
Outfalls	20 miles
TOTAL	**2,955 miles**
Wastewater Pumping Stations	12
Storm Water Pumping Stations	5
Metering Chambers	30
Manholes	84,590
Inlets	75,000
Regulator Chambers	175
Tide Gate Chambers	89
Diversion Chambers	23

These facilities serve a total population of approximately 2,286,000 spread over 230,600 acres, including approximately 1,586,000 people within the City and 700,000 in the outlying municipalities.

Due to the well established maintenance program utilized by the PWD, the general condition of the collector system is good. As mentioned above, the collection system provides service to virtually the entire City and ten surrounding municipalities/authorities for a total service area of 230,600 acres as itemized in Table 4.2.1 Service Area Summary.

The collection system provides this service through a vast network of sewers, storm drains, and interceptors made up of a variety of materials. A breakdown by material is shown in Table 4.2.2. The range of sizes within the collection system varies from 8" to 20' x 20' box culverts.

4.2.2 Interceptors

Local service is provided to each customer via house connections to a branch sewer, which in turn drains to a larger trunk sewer and finally to an interceptor. The 135 miles of interceptors collect the wastewater flow from about 2,200 miles of combined and separate sanitary sewers. Therefore, the interceptor system is of primary interest in evaluating the adequacy of the Philadelphia collection system due to its role in conveyance of wastewater flows to the WPCPs. The other element of the collection system that must be considered are regulators, which control the dry weather flow to the WPCPs and the overflow of stormwater during significant rain events. The regulators are located at critical points along the combined sewer system and can be utilized to take advantage of the potential storage within the trunk sewers to help control wet weather overflow.

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TABLE 4.2.1

SERVICE AREA SUMMARY

Tributary Area	Northeast (acres)	Southeast (acres)	Southwest (acres)	Interceptor	Design Flow (cfs)
Philadelphia	42,500	13,200	27,200		
Suburban					
Bucks County	45,000	-------	-------	Neshaminy Force Main/ Upper Delaware	40.0
Abington	4,500	-------	-------	Pennypack Creek	9.3
Lower Moreland	900	-------	-------	Pennypack Creek	5.4
Bensalem	4,400	-------	-------	Poquessing Creek	11.7
Lower Southampton	7,700	-------	-------	Poquessing Creek	5.4
Cheltenham	8,300	-------	-------	Tacony-Frankford Creek	21.2
Springfield	-------	300	4,500	Cresheim Valley Bridge/	1.9
				Upper Wissahickon (Low Level)	4.2
Lower Merion	-------	-------	12,100	Southwest (Main Gravity)	18.8
Upper Darby	-------	-------	7,800	Cobbs Creek	35.0
DELCORA	-------	-------	52,200	Force Main to SWWPCP	155.0
Total Suburban	70,800	300	76,600		
Total	113,000	13,500	103,800		
Total Area Served	230,600				

*Short-term

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TABLE 4.2.2

BREAKDOWN BY CONSTRUCTION MATERIALS

Separate System

Material	Sanitary (miles)	Storm Water (Branch) (miles)	Storm Water (Main) (miles)
Cast Iron		0.67	
Vitrified Clay	2.86	28.36	
Reinforced Concrete	577.17	148.50	26.39
Brick	0.81	102.05	11.09
Corrugated Metal	1.98	0.99	0.38
R.C. Box	----	----	28.58
Total	582.82	550.57	66.44
Total Separate System			1,199.83

Combined System

Material	Branch Sewer (miles)	Main Sewer (miles)	Relief Sewer (miles)	Outfalls (miles)
Cast Iron	2.84			0.21
Vitrified Clay	51.70			
Reinforced Concrete	240.73	37.84	8.82	4.61
Brick	1,004.05	104.70		6.74
Wooden				0.30
R.C. Box		42.88	2.09	8.04
Total	1,399.32	185.42	10.91	66.44
Total Miles Combined Sewer				1,615.55

TABLE 4.2.2 (Continued)

Intercepting Sewers

Material	Branch (miles)	Main (miles)
Cast Iron	7.30	0.51
Vitrified Clay	40.50	
Reinforced Concrete	25.25	18.77
Brick	11.03	10.61
R.C. Box	----	20.20
Total	84.08	50.09
Total Miles of InterceptingSewers		134.17
Total of Miles of Sewers		**2,949.55**

Note: Branch sewers <4.0 feet in diameter
Main sewers ≥ 4.0 feet in diameter

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Table 4.2.3, Primary Interceptor Summary, provides some pertinent details on the main interceptors within the Philadelphia collection system. Some smaller branches are not included in this summary, which accounts for the difference between the total lengths as presented in Tables 4.2.2 and 4.2.3. Figure 4.2-1 shows the location of the interceptors included in the Primary Interceptor Summary, and Figure 4.2-2 delineates the drainage area within the City for each interceptor in question.

The PWD maintains an inventory of the interceptor system utilizing a computer model to provide a comparison of the interceptor capacity to the estimated design flow for each reach of interceptor pipe. The intended design of the interceptor system is to provide the capacity to convey 110% of the dry weather wastewater design flow. This criteria has been established to ensure the elimination of dry weather overflows via combined sewer regulator chambers to the adjacent surface waters and to provide capacity to transport the first flush of stormwater runoff to the WPCPs for treatment. The computer model output identifies which sections of interceptors have a theoretical capacity above the established criteria (110% dry weather) design flow. The program computes the full flow design capacity for each section of pipe based on Manning's Formula. For pipes that are 27" or less in diameter, the criteria design flow is based on the pipe flowing half full; for pipes 30" or greater in diameter, the criteria design flow is based on the pipe flowing two thirds full. By basing the criteria design flow on a portion of the full flow design capacity, a conservative evaluation of the capacity of the interceptors is achieved.

The design flow for each interceptor, for purposes of the PWD evaluation, is calculated by multiplying the area draining to each section of interceptor by a design flow per acre based on the estimated population density for that area. The design flows per acre are presented in Table 4.2.4 for convenience of review. Furthermore, these design flows are based on a wastewater production of 120 gallons per person and include an additional 2,000 gallons per day per acre of infiltration. In order to account for the commercial and industrial customers in the drainage basin and to ensure a conservative estimated capacity, the design population densities are estimated higher than the actual population densities derived from the 1990 census as can be seen in Table 4.2.3, Primary Interceptor Summary. A conservative evaluation is evident by comparing the design and census population densities. The design population densities are on average 450% higher than the actual densities reported in the 1990 census.

It is prudent to consider the interceptor capacities on a conservative basis since the evaluation and design criteria of the interceptor system are based on theoretical values for capacity and flows. As stated before, by establishing the criteria design flows as a fraction of the full flow design capacities and by assigning higher population densities to each drainage basin, PWD's reported capacity of the interceptor system appear to be conservative. However, the computer model which inventories the interceptors and provides the theoretical design capacity does indicate that some sections of the interceptors within Philadelphia are below the established criteria described above. Due to the conservative nature of the computer model and design criteria and the fact that the capacities and design flows are based on theoretical values, the model is not conclusive as to the adequacy of the existing interceptors. Potential capacity problems should be considered when PWD determines that an interceptor requires further evaluation or when other conditions warrant replacement or repair of the interceptor. These sections of interceptors should receive additional attention by the PWD staff when planning future improvements.

TABLE 4.2.3
PRIMARY INTERCEPTOR SUMMARY

System	Plant	Length (feet)	Sewered Area (acres)	Number of Combined Regulators	Criteria at Outlet Section			Design PPA*	1990 Census PPA*
					Full Capacity (cfs)	Capacity Rated (cfs)	Design Flow		
Upper Delaware	NE	37,755	5,253.3	12	516.1	404.6	377.3	>120.0	20.52
Pennypack Creek -1	NE	37,169	8,299.5	5	228.9	165.7	104.1	38.9	14.99
Wooden Bridge Run -2	NE	19,120	1,246.0		31.8	24.9	18.3	33.7	N/A
Poquessing Creek -1	NE	53,909	3,617.0		112.1	87.8	90.4	68.2	9.46
Byberry Creek -2	NE	32,057	2,123.2		68.9	54.0	34.8	63.3	9.46
Walton's Run -3	NE	16,997	1,731.0		31.8	24.9	18.3	34.7	N/A
Lower Frankford (Low Level) -1 (includes Southwest Branch)	NE	7,882	3,006.0	6	82.4	64.6	52.2	68.2	20.52
Upper Frankford	NE	12,684	1,375.2	10	49.1	38.5	34.5	106.1	20.52
Tacony - Frankford Creek (High Level)	NE	17,813	10,265.5	14	262.6	205.9	181.2	59.5	31.17
Somerset (Low Level)	NE	11,141	1,935.0	9	95.0	74.4	49.7	108.8	19.51
Lower Delaware	SE	26,234	5,997.2	33	356.8	279.7	159.1	97.0	28.03
Upper Wissahickon (High Level) -1	SE	34,302	744.6		251.6	197.3	17.7	99.6	11.57
Cresheim Valley Bridge -2	SE	14,000	850.0		35.8	24.3	6.2	7.9	
Monoshone Branch -2	SE	4,000	965.3		39.0	30.6	6.8	17.8	
Oregon Avenue -1	SE	6,402	1,497.1		83.8	65.7	20.4	49.7	19.86
Southwest (Main Gravity)	SW	19,455	5,472.1	10	521.3	370.5	438.7	>120.0	24.76
Central Schuykill (East Side) -1	SW	38,035	3,322.1	18	205.1	145.6	143.5	>120.0	28.03
Upper Schuykill (Low Level) -2	SW	16,795	2,519.0		44.9	35.2	35.4	51.9	10.78
Upper Wissahickon (Low Level) -2	SW	38,452	3,468.0		107.8	84.5	29.5	18.9	10.78
Central Schuykill (West Side) -1	SW	11,810	1,408.0	9	89.0	69.8	41.9	>120.0	24.76
Lower Schuykill (East Side) -1	SW	14,340	2,063.0	9	100.7	79.0	45.5	91.6	19.86
Cobbs Creek -1	SW	28,194	2,469.0	23	147.9	115.9	103.8	120.0	24.76
Indian Creek -2	SW	4,285	622.0	13	56.3	44.2	24.6	>120.0	24.76
Lower Schuykill (West Side)	SW	19,241	1,383.7	4	68.9	54.0	6.9	7.7	11.36
Island Avenue - 80th Street	SW	22,175	1,860.0		106.3	75.6	35.0	75.3	11.36
Total Length in feet		**544,247**	**73,493.8**	**175**					
Total Length in miles/square miles		**103.08**	**114.8**						

*People Per Acre
N/A - not applicable
Note: Negative numbers beside interceptors denote number of indentation for that interceptor

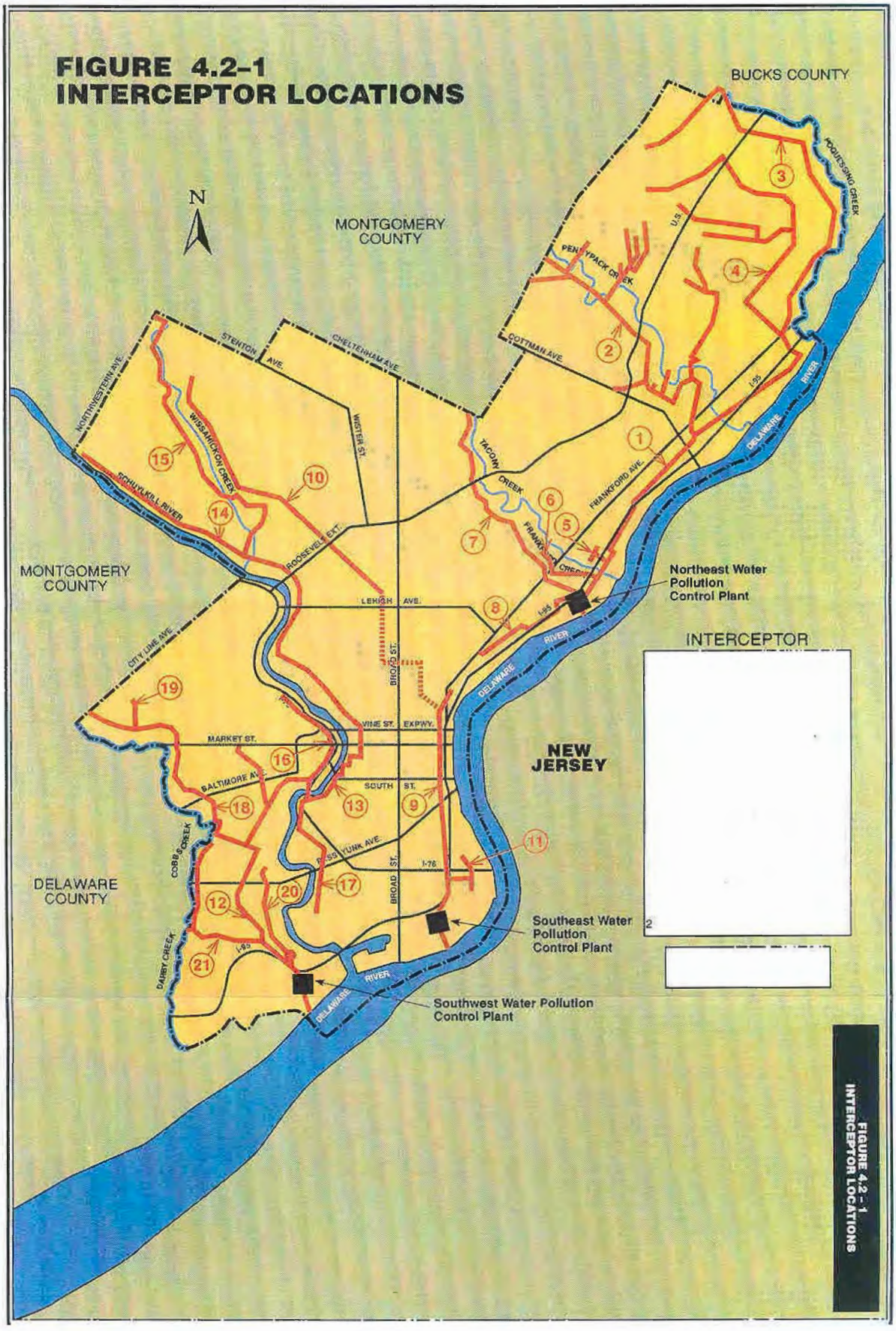
FIGURE 4.2-1
INTERCEPTOR LOCATIONS
BUCKS COUNTY
MONTGOMERY COUNTY
MONTGOMERY COUNTY
DELAWARE COUNTY
NEW JERSEY
N
STENTON AVE.
CHELTENHAM AVE.
COTTMAN AVE.
FRANKFORD AVE.
LEHIGH AVE.
CITY LINE AVE.
MARKET ST.
VINE ST. EXPWY.
SOUTH ST.
BALTIMORE AVE.
PASSYUNK AVE.
ROOSEVELT EXT.
WISSAHICKON CREEK
SCHUYLKILL RIVER
TACONY CREEK
FRANKFORD CREEK
POQUESSING CREEK
PENNYPACK CREEK
COBBS CREEK
DARBY CREEK
DELAWARE RIVER
BROAD ST.
WISTER ST.
NORTHWESTERN AVE.
I-95
I-76
U.S. 1
Northeast Water Pollution Control Plant
Southeast Water Pollution Control Plant
Southwest Water Pollution Control Plant
INTERCEPTOR
2
FIGURE 4.2 - 1
INTERCEPTOR LOCATIONS

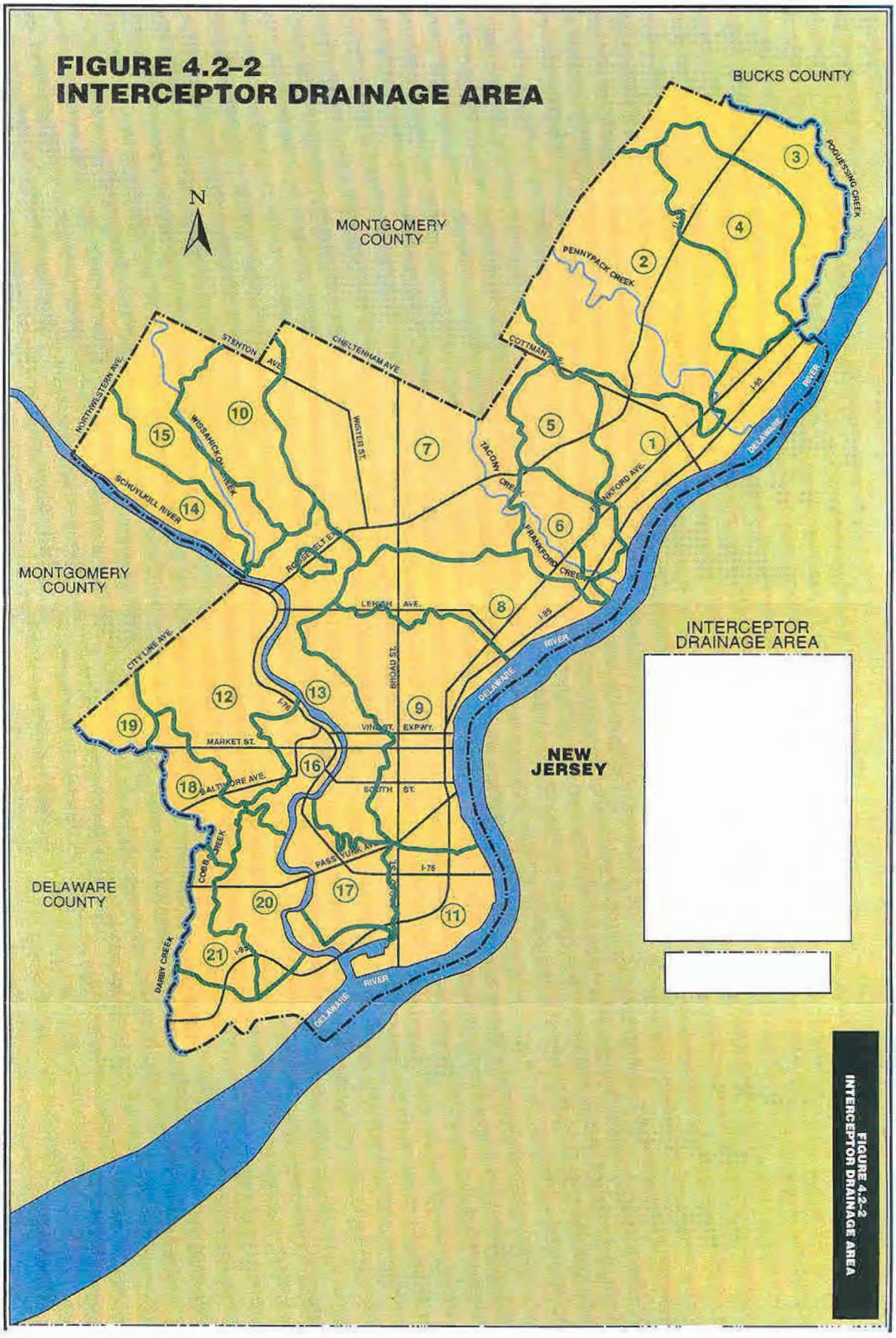
FIGURE 4.2-2
INTERCEPTOR DRAINAGE AREA
BUCKS COUNTY
MONTGOMERY COUNTY
MONTGOMERY COUNTY
DELAWARE COUNTY
NEW JERSEY
N
INTERCEPTOR DRAINAGE AREA
PENNYPACK CREEK
POQUESSING CREEK
COTTMAN AVE.
CHELTENHAM AVE.
STENTON AVE.
NORTHWESTERN AVE.
WISSAHICKON CREEK
SCHUYLKILL RIVER
WISTER ST.
TACONY CREEK
FRANKFORD AVE.
FRANKFORD CREEK
ROOSEVELT EXPY.
LEHIGH AVE.
CITY LINE AVE.
BROAD ST.
VINE ST. EXPWY.
MARKET ST.
BALTIMORE AVE.
SOUTH ST.
PASSYUNK AVE.
COBBS CREEK
DARBY CREEK
I-95
I-76
DELAWARE RIVER
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
FIGURE 4.2-2
INTERCEPTOR DRAINAGE AREA

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TABLE 4.2.4

DESIGN OF INTERCEPTING SEWERS

Type of Development	Persons per acre	Infiltration	Daily Max Total gals. per acre	Daily Max cfs per acre
Park	0	2,000	2,000	0.0031
Residential	10	2,000	3,200	0.0050
Residential	20	2,000	4,400	0.0068
Residential	40	2,000	6,800	0.0106
Residential	60	2,000	9,200	0.0143
Residential	90	2,000	12,800	0.0198
Residential	120	2,000	16,400	0.0254
Commercial	90	2,000	12,800	0.0198
Commercial	120	2,000	16,400	0.0254
Industrial	67*	2,000	10,000	0.0155
Industrial	83*	2,000	12,000	0.0186
Industrial	150*	2,000	20,000	0.0310
Industrial	233*	2,000	30,000	0.0465
Center City		2,000	64,000	0.0990

*Flow based on 120 gallons per capita per day.

A full listing of each segment of the interceptors is available, in the form of a computer printout, identifying the capacity, reserve capacity and shortfall where relevant. Appendix F includes a list of interceptor sewers that may be under capacity according to the design criteria. There is a lack of metered data for the interceptors that could be used to verify the theoretical design flow and capacities presented in the interceptor computer model. If questions of adequate reserve capacity for dry weather flows arise, it may be prudent to install meters in the interceptors with potential problems to confirm their flows and reserve capacity.

Table 4.2.1, Service Area of PWD Collector System also identifies which interceptors flow from each outlying municipality/authority drains. The flow from each outlying municipality/authority passes through one of 30 different meter chambers before being discharged into the Philadelphia interceptors or (WPCPs). Wastewater flow is measured at 19 of these chambers. Billing information derived from the remaining 11 chambers is based on historic standardized flow data. While the meters record the flow, separate equipment collects samples to determine BOD and suspended solids loadings from the respective municipalities in order to compile the data for billing purposes and to ensure their compliance with their respective intermunicipal agreements. Remote sensing flow meters, data loggers, and modems feed the data directly from the metering stations to the HP1000 computer at the Collector System Headquarters, which eliminates the need to manually collect data. The name and location of each meter chamber is presented in Table 4.2.5. The location of each meter station is shown in Figure 4.2-3.

At two points within the interceptor system, a diversion chamber has the capability to allow wastewater to be redirected from one water pollution control plant service area to another. These two diversion chambers are located as follows:

- The diversion chamber at Snyder Avenue and South 16th Street allows overflow from the Southeast service area to flow to the Southwest service area via the Passyunk Relief Sewer in the event of surcharging in the sewer in Snyder Avenue.

- The diversion chamber at 24th Street and Indiana Avenue directs dry weather flow to the Southeast service area while allowing the relief of wet weather flow to the Northeast service area in periods of high flow.

These facilities are essentially fixed and not considered a part of normal operations; however, they do have the potential to be adjusted by the addition of stop logs and, thereby, partially divert flow.

4.2.3 Pumping Stations

The Philadelphia wastewater collection system includes 12 sanitary pumping stations and 5 stormwater pumping stations. A package wastewater treatment plant at Fort Mifflin has two influent pumps and two effluent pumps and is the responsibility of the Department of Recreation. The stormwater pumping stations are included in this discussion since they are under the auspices of the PWD and are an integral part of the PWD system. Since they are drainage facilities, they will not be included in the evaluation section of this report. A summary of the pumping stations

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TABLE 4.2.5

METER CHAMBER LOCATIONS

Township	Meter Chamber	Plant
Lower Moreland	Byberry & Philmont	NE
Southampton	Trevose & Delvin	NE
Neshaminy	Neshaminy Pump Station	NE
Bensalem	Kay & Poquessing	NE
	Townsend & Poquessing	NE
	Dunks & Poquessing	NE
	Gravel & Poquessing	NE
	Knights & Frankford	NE
	Grant & James	NE
Abington	Fillmore & Shelmire	NE
	Shady Lane & Pennypack	NE
	Pine Road & Pennypack	NE
Cheltenham	Adams & Crescentville	NE
	Laurel & Tacony	NE
Springfield	Woodbrook & Stenton	SE
	Mermaid & Stenton	SE
	Winston & Stenton	SE
Springfield	Northwest & Stenton	SW
	Erdenheim & Stenton	SW
	Northwest & Thomas	SW
Lower Merion	Presidential & City Line Avenue	SW
	Conshohocken & City Line Avenue	SW
	51st & City Line Avenue	SW
	59th & City Line Avenue	SW
	63rd & City Line Avenue	SW
	66th & City Line Avenue	SW
	73rd & City Line Avenue	SW
Upper Darby	60th & Cobbs Creek N	SW
	60th & Cobbs Creek S	SW
	DELCORA	SW

FIGURE 4.2-3
METER CHAMBER AND PUMP STATION LOCATION MAP

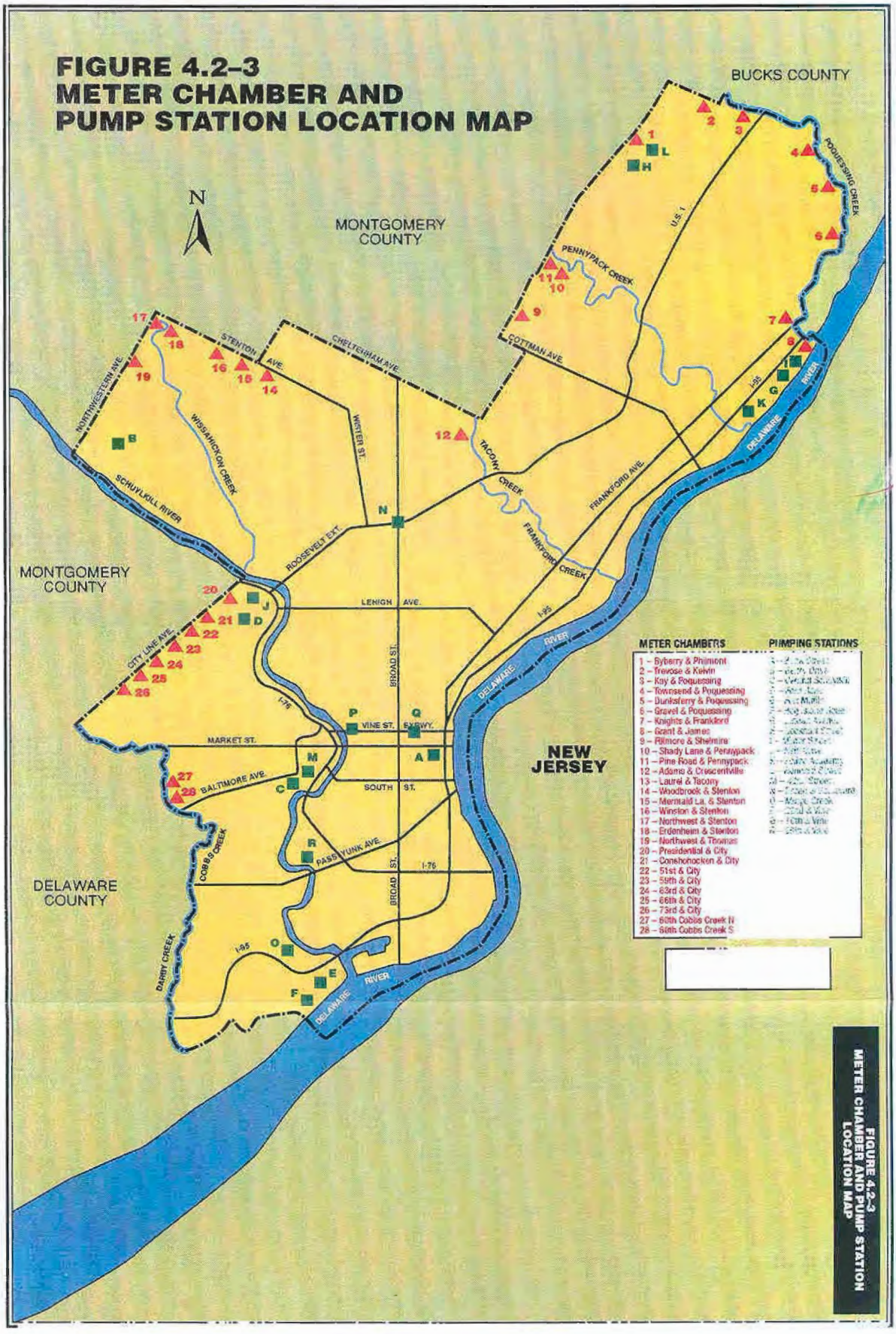

FIGURE 4.2-3
METER CHAMBER AND PUMP STATION
LOCATION MAP

located within the City, including their capacities and 1991 peak flows, is included in Table 4.2.6, Pump Station Summary. A description of each individual pumping facility is provided below. As described, two of the stations have dual feed power supplies. The others are covered by a contract that provides for operation of portable generators within two hours of a power failure. Figure 4.2-3 also shows the location of each pumping station described in this report.

As can be seen in Table 4.2.6, all of the wastewater pumping stations are operating under capacity, with a range from 5 percent of capacity at the Fort Mifflin facility to 67 percent at the 42nd Street Pumping Station.

The operation and maintenance of these sites is the responsibility of the Wastewater Pumping Group, which is part of the PWD Pumping Unit.

The general condition of these pumping stations is good due to the regular maintenance on an average three times a week each receives. Additional maintenance is performed on an as-needed basis due to malfunctions or clogging. Some stations with bar screens and communicators (see individual description below) are visited by maintenance personnel on a daily basis. In 1992, $950,000 was budgeted for the maintenance of the pumping stations. Table 4.2.6 also includes the history of the most recent refurbishment of the facilities, which occurs on an average of every 25 years for the major equipment.

Appendix G, Wastewater Pumping Station Spreadsheet Information, contains additional data for each pumping station including:

- Location
- Address
- Motor data
- Pump data
- Wet well data
- Flow data
- Station information, including conduit size

BANK STREET PUMPING STATION

Located in Center City, this below grade wastewater lift station handles the sewage for the condominiums and businesses located on Bank Street between Market Street and Chestnut Street.

Two submersible sewage pumps, rated 250 gpm at 39 feet Total Dynamic Head (TDH) with 7.5 Horse Power (HP) motors, pump the wastewater to the Market Street sewer. The station capacity is 500 gpm with an average inflow of 12 gpm. The flow destination is the Southeast WPCP.

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TABLE 4.2.6
PUMPING STATION SUMMARY

	Number of Pumps	Tested Capacity (each) (g pm.)	Total Station Capacity (gpm)	Peak Flow (gpm)	Percent Max flow/ Capacity (%)	Condition
Bank Street	2	292	584	70	12	One pump rebuilt in 1988. One pump rebuilt in 1989.
Belfry Drive	2	154	308	31	10	Station built in 1979.
Central Schuylkill P.S.	2 4	26,928 29,000	169,860	82,856	49	Two new pumps in 1973. Four new pumps in 1978. Two pumps rebuilt in 1987. One pump rebuilt in 1988.
Ford Road	2	759	1,518	444	29	Station completely rehabilitated in 1981.
Fort Mifflin*	2 Inf. 2 Eff.	40	80	7	5	
Hog Island Road	2	693	1,386	450	32	Station built in 1989.
Linden Avenue	2	920	1,840	251	14	Station built in 1968.
Lockart Street	2	586	1,172	296	25	Station built in 1968. One pump rebuilt in 1986.
Milnor Street	3	357	1,071	180	17	Station built in 1968. One pump rebuilt in 1986.
Neill Drive	3	1,787	5,361	3,092	58	Station competely rehabilitated in 1981. Three pumps rebuilt in 198?.
Police Academy	2	31	62	20	33	Station built in 1973. One pump rebuilt in 1987. One pump rebuilt in 1988.
Rennard Street	2	198	396	81	15	Station built in 1979. Two pumps rebuilt in 1987.
42nd Street	3	2,463	7,389	4,925	67	Station rehabilitated in 1981. One pump rebuilt in 1988. Two pumps rebuilt in 1989.

*Operated by Department of Recreation; planned to be phased out by 1994.

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Two hundred volt, single phase, single service power to the station is supplied through the local Philadelphia Electric Company (PECO) service in the area.

There is no overflow line from the station; the first sewage back up location is in the condominium courtyard adjacent to the station. There is no bar screen for the system and, the wet well is located under the pump floor.

BELFRY DRIVE PUMPING STATION

Located in Upper Roxborough, this lift station handles the domestic wastewater for the residential development in the immediate area (approximately 75 homes).

Two sewage pumps, rated 150 gpm at 75 feet TDH with 15 HP motors, pump the wastewater to the collector located 1,100 feet east of the station on Steeple Drive. The station capacity is 300 gpm with an average inflow of 23 gpm. The flow destination from this pumping station is the Southwest WPCP.

Two hundred thirty volt, 3-phase, single service power to the station is supplied through the local PECO service in the area. PECO uses 571 S. Manatawna Street for location identification.

Overflow from the station goes to the drainage right-of-way adjacent to the station. There is no bar screen for the system. The wet well is located next to the pump room vault.

CENTRAL SCHUYLKILL PUMPING STATION

Located just west of the Schuylkill River at the 34th Street Bridge, this is the largest lift station in the City and pumps the Central Schuylkill (East Side) and Central Schuylkill (West Side) Interceptors. The Upper Schuylkill, Central Schuylkill, and the Lower Schuylkill Interceptors merge at the Central Schuylkill Siphon - South Shaft located across the river from the pumping station.

This facility has two bar screens that prevent the twin 4-foot, 2-inch siphon tubes from becoming obstructed with large debris. The Schuylkill West Side Interceptor merges with the Schuylkill East Side Interceptor just outside of the pumping station at the North Shaft.

The pumping station consists of six main pump units, four constant speed pumps rated 29,000 gpm at 50 feet TDH with 450 HP motors, and two variable speed pumps rated 27,000 gpm at 49 feet TDH with 400 HP motors. The pump station lifts the wastewater to the Southwest WPCP gravity main.

The station has a firm hydraulic capacity of 195 mgd (135,500 gpm). The average inflow is 46,000 gpm. The normal pumping scheme is to operate one constant and one variable speed pump to match the inflow. In order to prevent flooding of the wet well, the station sluice gates will close automatically when the level reaches 12 feet in the bar screen channel.

Thirteen thousand two hundred volt dual feeders supply power to the station. Only one line is in operation at a time.

The auxiliary equipment at the pumping station includes:

- Two sump pumps to prevent station flooding
- Two service pumps for seal water and instrument backflushing
- Two booster pumps for the hydraulic operated discharge valves
- Two bar screen trash rakes to remove inflow debris

The overflow on the collector level chart recorder is 12.5 feet. At this level, the Schuylkill East Side Interceptor may overflow into the Schuylkill River at the S-7 regulator located under the Vine Street bridge on the east side of the river.

The Central Schuylkill Pumping Station is currently slated to undergo an extensive renovation including the total replacement of all electrical systems, wet well sluice gates, bar screens, and trash rake systems. Furthermore, the station will be fully automated at the conclusion of the contract, which is expected to be executed shortly.

FORD ROAD PUMPING STATION

Located across the street from West Park Hospital, 3900 Ford Road, this below grade lift station handles wastewater from local residences and West Park Hospital.

Two vertical wastewater pumps, rated 900 gpm at 142 feet TDH with 40 HP motors, pump the wastewater to the sanitary sewer located at Ford Road and Monument Avenue. The station capacity is 1,800 gpm with an average inflow of 198 gpm. The flow destination is Southwest WPCP.

Two hundred forty volt, 3-phase, single service power to the station is supplied through the local PECO service in the area. PECO uses 3800 Ford Avenue as the location identification. The pump room utilizes explosion-proof equipment.

The wet well has a bar screen and communicator to separate solids. The overflow from the station goes into a small creek, 50 feet east of the station, that drains to the Schuylkill River north of the Falls Bridge.

HOG ISLAND ROAD PUMPING STATION

Located on the north side of Hog Island Road, 500 feet east of the Philadelphia International Airport control tower, this lift station handles the wastewater for the UPS facility and the Crash, Fire, and Rescue Station located on the airport grounds.

Two vertical sewage pumps, rated 500 gpm at 150 feet TDH with 40 HP motors, pump the wastewater 6,000 feet north to the gravity sewer in Hog Island Road. The station capacity is 700 gpm with an average inflow of 26.2 gpm. The peak flow is limited to 400 gpm because of the UPS pumping station that discharges into the station.

Four hundred eighty volt, 3-phase power is supplied by the PECO transformer located outside of the station.

The wet well has no means of separating large solids, as it has no bar screen or comminutor. The pump floor and the wet well are confined spaces.

LINDEN AVENUE PUMPING STATION

Located just north of Baxter Treatment Plant at Linden Avenue and Milnor Street, this below grade wastewater lift station handles residential sewage for the nearby community.

Two vertical sewage pumps, rated 1,400 gpm at 26 feet TDH with 15 HP motors, pump the wastewater up to the Linden Avenue sewer. The station capacity is 2,800 gpm with an average inflow of 87 gpm. The flow destination is the Northeast WPCP. The pump room and the wet well utilize explosion proof equipment.

Two hundred forty volt 3-phase power is supplied by the local PECO service in the area. PECO uses 5200 Linden Avenue for the location identification.

The wet well has a bar screen to prevent large solids from entering the pumps. The pump room and wet well utilize explosion-proof equipment.

LOCKHART STREET PUMPING STATION

Located in the Somerton section of the City, this below grade lift station handles domestic wastewater for the local community.

Two sewage pumps, rated 600 gpm at 60 feet TDH with 15 HP motors, pump the wastewater to a gravity sewer on Nandina Street a few blocks away. The station capacity is 1,200 gpm with an average inflow of 158 gpm. The flow destination is the Northeast WPCP.

Two hundred forty volt, 3-phase, single service power to the station is supplied through the local PECO service in the area.

The wet well has a bar screen and comminutor to separate the large solids. The overflow from the station goes to a creek located approximately 1,000 feet to the west of the station. The pump room and wet well utilize explosion-proof equipment.

MILNOR STREET PUMPING STATION

Located in the Torresdale section of the City, this below grade lift station handles domestic wastewater for the surrounding community.

Two sewage pumps, rated 300 gpm at 36 feet TDH with 5.0 HP motors, pump the wastewater to a gravity collector in State Road. The station capacity is 600 gpm with an average inflow of 17 gpm. The flow destination is the Northeast WPCP.

Two hundred forty volt, 3-phase, single service power to the station is supplied through the local PECO service in the area.

The wet well has a bar screen to separate large solids. The overflow from the station goes to the Delaware River just east of the station.

NEILL DRIVE PUMPING STATION

Located in Fairmount Park just west of the Presidential Apartments, this lift station handles the wastewater for the community and an area hospital.

Three sewage pumps, rated 1,800 GPM at 172 feet TDH with 125 HP motors, pump the wastewater to the collector at Ford Road and Monument Avenue. The station capacity is 3,600 gpm with an average inflow of 1,250 gpm. The flow destination is the Southwest WPCP.

Thirteen thousand two hundred volt dual feeders supply power to the station.

The wet well has a bar screen and comminutor to separate large solids. The overflow from the station goes to a creek located approximately 1,000 feet to the west of the station. The wet well utilizes explosion-proof equipment.

POLICE ACADEMY PUMPING STATION

Located on the grounds of the Police Academy, this ground level wastewater lift station is the smallest public pumping station in the City and handles the sewage for the dog kennels and police facilities other than the main building.

Two submersible sewage pumps, rated 100 gpm at 24 feet TDH with 2.0 HP motors, pump the wastewater to a gravity sewer in State Road. The station capacity is 200 gpm with an average inflow of 3.1 gpm. The flow destination is to the Northeast WPCP.

Two hundred thirty volt, single phase, single service power to the station is supplied through the local PECO service in the area.

There is no overflow line from the station. The first sewage back up location is in the dog kennels. There is no bar screen for the system, and the wet well is located under the pump motor floor.

Along with the Central Schuylkill Pumping Station, this pumping station is slated for refurbishment in 1993, including new pumps, motors, and controls. This work is to be completed in-house by PWD personnel.

RENNARD STREET PUMPING STATION

Located in the Somerton section of the City, this station handles domestic wastewater for the surrounding community.

Two sewage pumps, rated 400 gpm at 46 feet TDH with 10 HP motors, pump the wastewater to the sewer at Rennard and Greiner Road. The station capacity is 800 gpm with an average inflow of 28 gpm. The flow destination is the Northeast WPCP.

Two hundred eight volt, 3-phase, single service power to the station is supplied through the 13,200 volt transformer on the grounds.

Overflow from the station goes to the drainage right-of-way adjacent to the station. There is no bar screen for the system. The wet well is located next to the pump room vault.

42ND STREET PUMPING STATION

Located at the intersection of 42nd and 43rd Street, this below grade lift station handles the wastewater in the Mill Creek Sewer.

Two vertical sewage pumps, rated 2,000 gpm at 45 feet TDH with 40 HP motors, pump the wastewater to the gravity sewer located across the street on the railroad embankment. The station capacity is 4,000 gpm with an average inflow of 4,873 gpm. The flow destination is the Southeast WPCP.

Two hundred volt, 3-phase, single service power to the station is supplied through the 13,200 volt transformer on the grounds.

The wet well has a bar screen and comminutor to separate solids. Overflow from the station drains into the Schuylkill River via the 43rd Street and Woodland Regulator. The pump room and wet well utilize explosion-proof equipment.

4.2.4 Force Mains

Two force mains that convey wastewater from outlying authorities warrant consideration since ownership and maintenance responsibilities have been contracted to Philadelphia. The DELCORA Force Main and the Neshaminy Force Main each originate from pumping stations

outside of the City (and, therefore, are not the responsibility of the City) and convey wastewater to Philadelphia from DELCORA and the Bucks County Water and Sewer Authority, respectively.

DELCORA Force Main - This 66-inch force main conveys wastewater from the Darby Creek Pumping Station to the Southwest WPCP with a peak capacity of 60 cfs (cubic feet per second). This pumping station and force main were built by DELCORA as agreed in the intermunicipal agreement between DELCORA and PWD executed in 1974, and thereafter the ownership and maintenance responsibilities of the force main within the City were transferred to PWD. The force main traverses the City for approximately 12,400 feet along the following route:

- The force main crosses Darby Creek in the vicinity of the intersection of 88th Street and Lindbergh Boulevard
- Continues north in Lindbergh Boulevard to 84th Street, than east to Barthram Avenue
- North again along Bartram Avenue to parallel the 80th Street Low Level Intercepting Sewer to the Screen, Blow and Pump Building at the Southwest WPCP.

Neshaminy Force Main - The Bucks County Water and Sewer Authority is currently installing a new 42-inch force main into Philadelphia to parallel the existing 36-inch force main that currently conveys wastewater flows from Bucks County to the Northeast WPCP. This additional force main is part of a comprehensive improvement on the part of Bucks County to serve the Neshaminy watershed. The 42-inch force main is expected to be completed in 1993 and aid the existing system in conveying wastewater flow from the Totem Road Pumping Station (also upgraded) to the Upper Delaware Interceptor. The ultimate capacity of the upgraded pumping station and force main will be 40 cfs. The paths of both force mains lie within State Road from the City boundary across the Pennypack Creek to Rhawn Street for a distance of approximately 13,350 feet.

STORMWATER PUMPING STATIONS

Broad and Boulevard Storm Water Pumping Station

Located on the Roosevelt Boulevard Extension at the Broad Street underpass, this pumping station handles the road surface stormwater runoff and some groundwater infiltration.

Two submerged centrifugal pumps, rated 3000 gpm at 54 feet TDH with 60 HP motors, handle the groundwater infiltration and most storms. Two mixed flow pumps, rated 10,000 gpm at 47 feet TDH with 150 HP motors, handle the larger storm events. The 1991 calendar year average inflow was 73 gpm. When the basin level exceeds the second lag pump level, the small pumps turn off. After a 10-second delay, the large pumps come on to pump the water level down.

Four thousand-one hundred sixty volt dual feeders supply power to the station. Only one line is in operation at a time with an automatic transfer switch that closes should either of the lines lose power. The 4,160 to 460 volt transformer and switchgear are located in the electrical room next to the pumping station.

There are three bar screens located in the front of the building to prevent trash and debris from entering the wet well. The wet well is a confined space. Confined Entry Procedures must be followed before entering the wet well.

Mingo Creek Storm Water Pumping Station

Located next to the southwest WPCP and the Sludge Processing and Distribution Center, this stormwater retention basin and pumping station handle the stormwater runoff from the Philadelphia International Airport and the Eastwick section of the City.

Six mixed flow pumps, rated 56,300 gpm at 28 feet TDH with 500 HP motors, are available to handle the stormwater flow. Normally one pump is set to run or automatic. In the event of a large storm, additional pumps can be turned on by a Chatterbox remote control feature. The 1991 calendar year average inflow to this station was 4,827 gpm.

The basin elevation is maintained between 14.0 feet and 16.0 feet. In the event of a large storm, the elevation can rise to 19.0 feet before a high level alarm is activated. The flood level elevation has not been determined yet, but the water surface has been as high as 28 feet without causing flooding in the area.

The station operates on a night rider. Pump operation is limited to off peak hours (8:00 pm to 6:00 am Tuesday - Thursday and 4:00 pm Friday through 8:00 am Monday).

Thirteen thousand-two hundred volt dual feeders supply power to the station. A 13,200 to 550 volt transformer and switchgear area located in the electrical room at the station.

There are four bar screens and a trash rake located on the basin side of the building to prevent trash and debris from entering the pumps.

22nd and Vine Storm Water Pumping Station

Located on the northeast corner of 22nd Street and Vine Street at the underpass level, this pumping station handles the Vine Street Expressway underpass stormwater, from 15th Street to 24th Street.

Three mixed-flow pumps, rated 3000 gpm at 35 feet TDH with 40 HP motors, handle the stormwater flow and a steady flow of groundwater infiltration.

Thirteen thousand-two hundred volt dual feeders supply power to the station. The 13,200 to 480 volt 2-phase transformer and switchgear are located in the fenced area on PECO property. These transformers also provide power to the street lighting outside.

There are two bar screens located on the influent side of the building to prevent trash and debris from entering the pumps. Entrance to the bar screens is through the steel grating next to the entrance door and at the head of a retention basin about 120 feet east of that opening.

The bar screen chamber and retention well are confined spaces. Confined Space Entry Procedures must be followed in these areas.

10th and Vine Storm Water Pumping Station

Located on the southwest corner of 10th Street and Vine Street at the overpass level, this pumping station handles the Vine Street Expressway underpass stormwater, from 6th Street to 15th Street.

Three mixed-flow pumps, rated 3000 gpm at 36 feet TDH with 40 HP motors, handle the stormwater flow.

Thirteen thousand-two hundred-volt dual feeders supply power to the station. The 13,200 to 480 volt transformer and switchgear are located in the electrical room.

There are bar screens located on the influent side of the building to prevent trash and debris from entering the pumps. Entrance to the bar screens is through the steel grating next to the pumping station entrance.

The bar screen chamber and wet well are confined spaces. Confined Space Entry Procedures must be followed in these areas.

Operations and Maintenance of both the above 22nd and Vine and 10th and Vine Street Stormwater Pumping Station was transferred to PennDOT in May 1992.

26th and Vare Storm Water Pumping Station

Located on the southwest corner of Passyunk Avenue at Vare Avenue and 26th Street on the overpass level, this pumping station handles the 26th Street underpass stormwater runoff.

Two vertical centrifugal pumps, rated 2000 gpm at 35 feet TDH with 30 HP motors, handle the stormwater inflow. There is no groundwater infiltration.

Two hundred-thirty volt, 2-phase, dual feeders supply power to the station. The power and control for the street lighting outside is located in the building.

There are bar screens located on the influent side of the building to prevent trash and debris from entering the pumps. Entrance to the bar screens is through the steel Bilco door located on the control level.

The wet well is a confined space. Confined Space Entry Procedures must be followed in these areas.

4.2.5 Combined Sewer System

As mentioned above, about 60% of the collection system within Philadelphia is comprised of combined sewers with the balance being serviced by separate sewers. The combined sewers and interceptors have been designed to convey all dry weather flow to the WPCPs while bypassing flows greater than this to adjacent surface waters. This arrangement provides treatment for all dry weather wastewater flow, a majority of the stormwater runoff that results from small storms, and the first flush runoff of larger storms. Occasionally, malfunctioning regulators or choked effluent sewers, which connect the regulator chambers with the intercepting sewers, cause minor discharges of dry weather flow through the outfall sewers directly to the receiving stream. The operational status of the regulators and inspection results are reported to PADER in PWD's monthly Interceptor Report. As detailed in Section 2.4.5 Current Studies/Pending Legislation of this report, there are currently several studies underway to determine the impact of these wet weather overflows on the receiving waters, including one for the Delaware Estuary by the Delaware River Basin Commission. Also discussed in Section 2.4.5, new Combined Sewer Overflow (CSO) regulations are expected that will impose further restrictions on the combined sewer system.

Wet weather overflows are inherent in the concept of a combined sewer system, and are a product of the design and purpose of the system. Without the relief provided by the regulator chambers, many areas of the City would experience severe flooding during significant rain events, there would be excessive flows within the collection system, and wastewater would pass through the treatment plants without receiving adequate treatment. The combined system also provides for the treatment of stormwater runoff for many small storms that are not large enough to produce flows which exceed the capacity of the interceptors and the first flush of the larger storms by diverting those small flows to the WPCPs. The highest concentrations of pollutants in urban runoff are reported to be carried off in these small storms and first flushes. The quantity of wet weather overflow depends on the intensity and duration of the storm event, stream tide levels, and background dry weather flow quantities.

Flow through Philadelphia's combined sewer system is controlled by the 175 regulating chambers and 23 diversion chambers located throughout the interceptor system. The basic function of each regulator is the same; however, the goal is achieved through several different methods by the six types of regulators that are utilized by PWD. Basically, the regulator is designed to divert all dry weather flow within the combined sewers to the interceptors and then to the water pollution control plants for treatment. During wet weather events, as the hydraulic capacity of the interceptors is reached, the regulator diverts excess flow to adjacent surface waters. As the storm flows subside, the regulators discontinue direct discharge to the adjacent surface waters and

contain all of the flow within the combined sewer system. The breakdown of the types of regulators and the extent of their respective use in service within the Philadelphia system is presented here:

Regulator Types In Use In Philadelphia:

Regulator Type	Number in Service
Slot	69
Brown & Brown	72
Manual Gate	4
Dam	8
Water Hydraulic Cylinder	14
Computer Controlled	8
Total	**175**

Detailed lists of the locations of the discharge points are included in the NPDES permit documents included in Appendix H.

The slot, dam, and manual gate regulators have a preset discharge opening to the interceptor system that does not change as the stormwater and wastewater flows vary. The preset opening is normally set to allow only the amount of flow that the receiving interceptor can hydraulically convey. The Brown & Brown and water hydraulic cylinder regulators are mechanically controlled to vary the flow diverted to the interceptor system and receiving waters as the stormwater and wastewater flow varies within the system. The controls are set to limit the flow to the interceptor system to flows which it is hydraulically capable of passing. Each system is equipped with a backflow preventer to ensure against contamination of the potable water system. Additionally, in the late 1970s, the PWD constructed three prototype computer controlled regulator chambers in the Northeast Drainage District (Magee, Dark Run Lane, and Ash) as an experimental program.

In response to the Consent Decree Agreement between the U.S. Environmental Protection Agency, Delaware River Basin Commission, Sierra Club of Maryland and Pennsylvania in 1978, five additional regulators were automatically controlled by computer as part of the $1.8 million CSO automation project for the Northeast drainage basin. These regulators are controlled by a local programmable logic controller (PLC) and are monitored by a centralized computer center at the Collector System Headquarters in order to minimize dry weather overflows and increase the storage capacity of the trunk sewers, thus reducing the amount of wet weather overflow during significant storm events. Each PLC monitors flow levels in the trunk, effluent, and outfall sewers at the regulator and automatically adjusts the discharge openings to the interceptor sewers and outfalls to minimize wet weather overflow. Also, as part of this project, sewer flow level monitors were installed at 45 regulator chambers within the Northeast Drainage District. The data from these CSO monitoring sites is used to indicate when the regulators and tide gates are malfunctioning and alert maintenance personnel of the need for repair. By identifying malfunctioning regulators, this system could minimize the effort spent on inspecting good order

regulators, which occurs under the current regularly scheduled maintenance program in the Southeast and Southwest Drainage District. In August 1990, the PWD began to use the computerized data from the Northeast CSO Automation Project to dispatch maintenance crews to suspected trouble spots. At this time, the program remains in the developmental stage and has resulted in mixed success. If data reliability can be improved, this system may become more attractive and expanded in light of the potential regulations for wet weather combined sewer control.

Although there has not been a comprehensive hydraulic analysis of the effect of the automated computer system on the quantity of wet weather overflow, it has been noted by the PWD that the in-line storage levels within those computerized trunk sewers already involved has increased dramatically.

As another element of the CSO system, 24 rain gauges have been installed throughout the City in order for PWD to monitor storm events and eventually estimate the amount of wet weather overflow from the combined system. Data collected from these gauges will assist in developing a program to maximize the amount of in-line stormwater storage and reduce the amount of flow discharged to the adjacent surface waters.

Eighty-nine of the regulators in the Philadelphia combined sewer control system are tidally affected and have tide gates that control the direction of flow, depending on the depth of tide. In the past, inflow at some of these tidally affected regulators has been a problem, transmitting river water to the water pollution control plants. These tide gates currently serve a dual purpose, to prevent the discharge of dry weather flow to the receiving streams and to prevent river water from entering the collection system during high tides. Most tide gates have emergency overflow weirs above the gate to allow the discharge of stormwater in the event of a hydraulically surcharged or malfunctioning tide gate. In the future, these tide gates may be utilized to increase trunk sewer storage during wet weather events.

The breakdown of the types of tide gates in service within the Philadelphia system is presented below:

Name	Number of Sites	Number of Gates
Coldwell Wilcox Pontoon	36	65
Brown and Brown Cast Iron	33	38
Computer Controlled	8	10
Brown and Brown Timber	8	15
Water Hydraulic	3	3
Manual Gate	1	1
Total	**89**	**132**

4.2.6 Private Sewers

There are some sewers within the City that have never been recorded with, nor are considered owned by, PWD. Most of these private sewers were built on private property before the turn of the century and eventually tie into the City's wastewater collection system. Therefore, they are

generally found in the older sections of the City in alleyways, cellars, and backyards. Concentrations of private sewers are found in the following areas:

- In North Philadelphia bounded by Girard Avenue on the south, Allegheny Avenue on the north, Front Street on the east, and the Schuylkill River on the west.

- In West Philadelphia bounded by Market Street on the south, 32nd Street on the east, 40th Street on the west, and the Pennsylvania Railroad Main Line on the north.

- In Northwest Philadelphia bounded by Cheltenham Avenue on the north, Germantown Avenue on the south, Cresheim Creek on the west, and the Reading Railroad on the east.

Since private sewers have never been recorded with PWD, it is difficult to determine the extent of these sewer lines; however, when compared to the size of the Philadelphia collection system the number of homes that are served by these sewers is minimal. Private sewers are generally brought to PWD's attention only when there is a problem with the line and citizens register complaints. Some private sewers have been eliminated with the demolition of older homes. However, some properties are being restored and the new owners are faced with the problems associated with antiquated, inadequate private sewers.

PWD does have an adequate policy which responds to private sewer situations periodically raised by residents and is implemented as these situations arise. Complaints concerning private sewers are taken by PWD's Customer Service Department, which issues a work order for a response to the situation. PWD maintenance crews are directed to inspect the sewer line in question to determine the cause and extent of the problem. PWD then notifies all users of the problem sewer line and their responsibility for repair of the sewer. If no action is taken by the residents, the PWD will contract with a private contractor experienced in such work and bill the residents for the services accordingly. Through this effort, the problem is rectified, service is restored, and the repair paid for by the those parties serviced by the sewer line.

Although these private sewer lines are connected to the public system, PWD does not own them and has no responsibility for maintaining them. These sewers cannot be incorporated into the public system because they do not meet the minimum standards for public sewers. They are not built in locations served for the construction of public sewers, do not have manholes, and are mostly 6-inch and 8-inch lines. Their location in backyards and other confined areas makes it impossible for PWD to clean them.

Construction of public sewers within bordering streets may not be a reasonable solution for the homeowner since costly reversal of internal plumbing is required to service the property.

4.2.7 Maintenance of the Collector System

The Philadelphia Water Department has a well established and effective maintenance program that provides inspections, evaluations, cleaning, rehabilitation, and repairs to the various components of the collection system through ongoing and preventive maintenance. Operation and maintenance of the collector system is the responsibility of the Waste and Storm Water Collection Group, which is comprised of the following units:

- Sewer Maintenance
- Inlet Cleaning
- Data and Flow Control
- Collector System Support

Repairs and maintenance beyond operational capability are recommended to the Planning and Engineering Division for inclusion in the Capital Improvement Program. The Planning and Research Unit then prioritizes and gives direction to this future work.

4.2.7.1 Sewer Maintenance

The Sewer Maintenance Unit is charged with the maintenance of the city-wide combined, sanitary, and stormwater systems and their appurtenant structures. Included in this category are all branch, interceptor, and main sewers; the maintenance of inlet laterals, inlets and manholes; cleaning and repair of drainage ditches and outlets; maintenance of drainage right-of-ways, and lands for public use; and CSO outlets. In addition to repairing sewers, much of the unit's work involves cleaning and clearing choked sewers using high pressure water jet machines, mechanical bucket machines, and rodder machines.

Cooperation with other City agencies and Department units is necessary in order to perform thorough investigations and prepare reports, on all sewer related conditions. In the past, Sewer Maintenance has examined branch and main sewers and prepared lists of sewers to be reconstructed, under the Sewer Reconstruction Program. If in preparation of the plans and specifications the Engineering Division requires more information, Sewer Maintenance conducts additional surveys and may even excavate the sewer to obtain the additional data. When new water main relays are to installed or the roadway is to be repaved, Sewer Maintenance will perform an inspection of the sewer in the area.

Customer Service uses the resources of Sewer Maintenance to solve drainage and flooding problems in building and private dwellings. The Construction Unit has found the TV capabilities of Sewer Maintenance a good way to document sewer conditions at the end of a job, or to locate defects in a sewer too small or too dangerous for physical inspection. Sewer Maintenance also works with the Distribution Unit on street cave-ins. The Unit follows up on repairs to the sewer and laterals where a water main break has caused sewer system damage, and backfills trenches. The Unit also works with Industrial Waste in performing investigations for cross connections, illegal discharging of fats and grease, or other materials that clog the sewers.

The Unit works with Vector Control Services of Philadelphia Department of Public Health in identifying breaks in the collection system, including private drainage systems, which may result in the issuance of a violation notice to the homeowner.

4.2.7.2 Inlet Cleaning

The Inlet Cleaning Unit is primarily responsible for the inspection and cleaning of 75,000 storm water inlets within the City. The Unit is also charged with the following additional responsibilities: retrieving and replacing inlet covers, installing original replacement covers, and installing locking covers; unclogging choked inlet traps and outlet piping so that inlets can take water; alleviating flooded streets and intersections when hydrants are opened during fire-fighting operations.

In order to insure the efficient operations of the City's inlets and connecting storm sewers, it is necessary to work with various units of the Department, as well as other City agencies. For example, close cooperation is maintained with Sewer Maintenance, since our functions are interrelated. The Unit is also called upon periodically by the Police Department to perform searches of inlets for various law enforcement reasons.

The Unit is also involved with the cleaning of choked sewer manholes and regulating chambers; and retrieving keys for the public. Referrals are made to Sewer Maintenance in connection with repairs to inlets, and flooded cellars in need of pumping due to clogged inlets.

The Unit's specialized cleaning equipment is also involved in assisting other City agencies with the cleaning of their inlets.

4.2.7.3 Data and Flow Control

The Data and Flow Control Unit is responsible for the operation, inspection, cleaning, maintenance, and repair of regulators, tide gates, diversion chambers, syphon valves, and related wastewater control devices. The Unit's area of responsibility cover all 175 combined sewer regulator chambers, 89 tide gates chambers and 23 division chambers within the City. These chambers are located along with Delaware and Schuylkill Rivers and Pennypack, Frankford, Tacony, and Cobbs Creeks. In addition, the Unit is available to respond to oil and chemical spills, fires or any other type of emergency involving the combined sewer regulator system.

Strict safety precautions are followed at all times. Regulator chambers are considered confined spaces. Thus, the employees of the Unit perform confined space entry work on a daily basis. They are continually exposed to the hazards associated with turbulent flowing water, domestic sewage, industrial wastes, oxygen deficiency, and toxic and explosive gases.

As a result of the recent merger with Data Acquisition, the Unit is now also responsible for: the Northeast CSO Control and Monitoring system, wastewater metering chambers, citywide rain gauge network, CCTV inspection equipment maintenance, and the calibration and repair of confined space gas meters.

4.2.7.4 Collector System Support

The Collector Support Unit works with other Departmental Units, various City agencies, and federal and state regulatory agencies, on projects related to waste and storm water collection. However, the primary function of the Unit is to provide technical expertise to the operating units, through engineering evaluations and studies. The major operating units within the Section are Sewer Maintenance, Inlet Cleaning and Data and Flow Control.

Collector Support is often requested to conduct engineering studies in order to resolve a problem that may be caused by age-related deterioration, past building practices, or new regulatory mandates. The study usually involves the development of a plan of action, coordination of physical and videotape inspections by operational forces, analysis of field data, and the preparation of a final report. The report normally includes alternative solutions and a recommended course of action.

Collector Support also investigates complex drainage and flooding problems. These investigations may involve the review of construction and return plans, analysis of historic data, citizen interviews, and surface and underground inspections of the collector system. The information gathered in the field is evaluated and then used to develop a plan for corrective action. The implementation of the plan often involves the coordination of repairs by operational forces or participation with the Design Branch in plan and specification preparation.

Collector Support conducts hydraulic analyses of the collector system through field surveys and theoretical and computer aided calculations. The installation of flow monitoring equipment is coordinated with the Data and Flow Control Unit. Afterwards, the data is reduced and analyzed, and a final report is prepared.

Major construction projects are coordinated with the operating units to ensure that construction activities do not adversely affect the operation of the existing collector system. When required, Collector Support coordinates the activities of the operational forces through project completion.

Collector Support is also responsible for management of maintenance contracts on collector system equipment. The contract documents and specifications are prepared by the Section and completed work is inspected to insure adherence to contract specification.

4.3 WATER POLLUTION CONTROL PLANTS AND SLUDGE PROCESSING

4.3.1 Northeast Water Pollution Control Plant

4.3.1.1 Ownership

The Northeast Water Pollution Control Plant (NEWPCP) is owned by the City of Philadelphia and operated as a self-supporting utility by PWD. PWD is responsible for planning, construction, operation and maintenance, budgeting, detailed cost accounting, and setting sewer rates.

4.3.1.2 Point of Discharge

NEWPCP is permitted to discharge treated effluent to the Delaware River (Zone 3 of the Delaware Estuary) from Permit Source 001, which is located at latitude 39°58'50.6" and longitude 75°04'34.9". National Pollutant Discharge Elimination System (NPDES) effluent limitations have been established for this WPCP and outfall in permit No. PA 0026689 which is included in Appendix H. Also included in this permit are 59 other discharge points that serve as combined sewer reliefs, necessitated by the collection of stormwater and sanitary sewage in a combined system as detailed in Section 4.2.5. These reliefs act to prevent a hydraulic overload of the collection system and NEWPCP. These discharges do not have specific effluent limitations; however, a discharge is permitted only when the collection system and NEWPCP maximum hydraulic capacities have been reached.

4.3.1.3 NEWPCP Effluent Discharge Limitations

As mentioned above, NEWPCP has been issued an NPDES Permit for the plant effluent and is responsible for complying with the effluent quality and quantity limitations established in that permit. The permit under which NEWPCP is currently operating expired on August 28, 1991. Provisions in this permit allow continued operation of and discharge from NEWPCP after this date. Permit limitations remain in effect until a new permit is issued, provided that a timely and complete permit application has been filed. The permit application and applicable fees were transmitted to PADER on March 21, 1991.

The permitted average monthly flow of effluent discharged from the NEWPCP shall not exceed 210 million gallons per day (mgd). The plant is to be operated to provide treatment for the maximum design wastewater flow of 315 mgd (maximum daily average) and 420 mgd (peak) without causing treatment process upsets. Throttling of influent flows to NEWPCP resulting in premature and avoidable sewer system overflows is prohibited.

A summary of the effluent limitations is presented in Table 4.3.1. The permit establishes specific monitoring requirements and effluent limits for BOD_5, suspended solids, first stage oxygen demand, fecal coliform, pH, zinc, Acrylonitrile, 1.2-Dichloroethane, Bis(2-chloroethyl ether) and Alpha BHC. Other parameters (i.e., TKN, Chloroform) are required to be monitored but do not have specific discharge limitations at this time. All parameters are reported in monthly Discharge Monitoring Reports (DMRs) submitted to PADER, EPA, and the Delaware River Basin Commission (DRBC).

The Delaware River Basin Commission has established enforceable BOD_5 limitations for Zone 3 of the Delaware River Estuary, into which NEWPCP discharges. The requirement includes an 86% of BOD_5 monthly average reduction from the influent to effluent. The percent reduction is calculated from analysis results of 24-hour composite samples of the influent and effluent. The influent sample must reflect the true characteristics of the raw wastewater and must not be affected by the plant recycle flows. Values reported in the DMR have been adjusted for recycle loads.

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TABLE 4.3.1

NEWPCP NPDES EFFLUENT LIMITATIONS FOR POINT SOURCE 001

Discharge Parameter	Discharge Limitations						
	Mass Unit (lbs/day)			Concentrations (mg/l)			
	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Instantaneous Maximum
BOD-5[1]	42,400	63,600		30	45		60
BOD-5 % Removals[1]	DRBC	Zone 3 Requirement		86% reduction			
Suspended Solids[1]	52,540	78,810		30	45		60
FSOD[2]	72,500						
Fecal Coliform (5/1 - 9/30)		See Footnote[3]					
Fecal Coliform (10/1 - 4/30)		See Footnote[3]					
pH	Within 6 - 9 Standard Units at all times						
Zinc, Total				0.250			0.500
Acrylonitrile						0.020	
1,2-Dichloroethane						0.500	
Bis(2-chloroethyl ether)						0.015	
Alpha BHC						0.010	

[1]In no case shall the arithmetic means of the effluent values of the BOD5 and Suspended Solids discharged during a period of 30 consecutive days exceed 14 percent and 15 percent, respectively of the associated arithmetic means of the influent values for those parameters during the same time period, except as specifically authorized by the permitting authority.

[2]FSOD - First stage oxygen demand (20 day Biochemical Oxygen Demand test with nitrogenous oxygen demand inhibited).

[3]Effective disinfection to control disease producing organisms during the swimming season (May 1 through September 30) shall be the production of an effluent which will contain a concentration not greater than 200/100 ml of fecal coliform organisms as a geometric average value, nor greater than 1,000/100 ml of these organisms in more than 10 percent of the samples tested.

[4]Monitor only required for: NH_3-N, TKN, NO_2-N, NO_3-N, Total Beryllium, Total Cyanide, Free Cyanide, Phenolics, Chlorobenzene, Chloroform, Methyl Chloride, 1,2-Transdichloroethylene, 2-Chlorophenol, Trichloroethylene, 3,3-Dichlorobenzidine, Phenanthrene, and Pyrene

Exceedances of the permitted effluent quantity and quality limits are reported to EPA, PADER, and DRBC in the monthly DMRs. All instances of exceedance in the past three years were related to O&M problems. Storm events precipitated some of the problems, causing CSO violations. During this period, there have also been problems associated with the grit chamber and the chlorination system. A detailed listing of these exceedances and causes thereof are shown in Appendix I.

Some other permit provisions that apply include requirements to operate an Industrial Pretreatment Program, management of toxic pollutants, and self-monitoring and reporting requirements.

NEWPCP has also had several plant upsets, interferences, or permit violations directly related to industrial user discharges to the sewer system. A summary of the Industrial Waste Unit (IWU) investigations of these incidents since 1989 is presented in Table 4.3.2. The preliminary treatment building (PTB) at NEWPCP is the first venting site along the sewer system for several industrial plants. Occasionally, volatile hydrocarbons have caused odors in the PTB. These odors are generally short-lived and result in restricted access to the building while the odor is present. These restrictions can impact the completion of maintenance operations in this area, but usually do not affect the treatment process or effluent quality.

The IWU has installed a gas chromatograph (GC) to identify the presence of 14 industrial chemicals in the sewer headspace in the PTB. The chemical identification can help pinpoint the source of the discharge based on industrial process information collected by the IWU. The IWU can then respond and inspect the suspected facility and require that the discharge be discontinued and information collected related to the release.

4.3.1.4 Municipal Wasteload Management Reports (Chapter 94)

Through Chapter 94 of PADER's Title 25: Rules and Regulations, the Commonwealth of Pennsylvania requires the owners and operators of sewage facilities to manage the wasteloads discharged to their facilities and prevent the occurrence of overloaded sewage facilities. If a facility is frequently overloaded, the regulations require a limitation on additional extensions and connections made to the system. To determine compliance with the requirements, each plant must submit an annual report that not only details and projects the loadings to be received by the treatment facility, but also describes the basis for the projections. The annual report must also present discussions of the condition of the sewer system, programs in place to monitor and repair the sewer system, the condition of sewage pumping stations, a description and map of all sewer extensions constructed in the past year, and a report of industrial waste discharge programs in place.

The annual report submitted by the PWD contains the information required by the Chapter 94 regulations. Presented here is a discussion of the hydraulic and organic overload determinations reported in recent Chapter 94 submissions. PADER's rules require graphs of hydraulic and organic loading from average daily data for each month over the past five years. They also require a projection of the anticipated loading for each of the next five years along with a

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TABLE 4.3.2

INVESTIGATION SUMMARIES OF INDUSTRIAL RELEASES TO THE NEWPCP SEWER SYSTEM

Date	Source	Explanation
1989	Rohm and Haas DVI	DDT/DDD/DDE residues were identified in the NEWPCP sludge due to a build-up of contamination in the sewer system section. The sludge must be landfilled. Rohm and Haas has paid the disposal costs and is investigating remedial measures to clean up the sedimentation.
2/27/1991	Rohm and Haas DVI	A solvent odor in the PTB initiated an investigation of Rohm and Haas' discharge. An excessive discharge from a rail tank car overloaded their solvent separator, resulting in a release of a variety of alcohols and surfactants. No plant damage occurred, but access to the PTB was restricted. The company was fined for the incident.
3/04/91	Rohm & Haas DVI	Rohm and Haas reported a diisobutylene (DIB) and Xylene release to the IWU. The source was reported to be a hose that ruptured during product transfer. No damage to the plant occurred, but PTB access was temporarily restricted. Rohm and Haas was required to investigate the cause and develop methods to prevent a recurrence.
5/29/91	Allied Chemical	A solvent odor in the PTB initiated an investigation of the Allied Chemical discharge. The material released was believed to be cumene and may have resulted from maintenance of flow monitoring equipment. No plant damage occurred, but access to the PTB was restricted. No fine was levied for this incident.
10/31/91	Allied Chemical	A solvent odor in the PTB initiated an investigation of the Allied Chemical discharge. The material released was believed to be cumene and may have resulted from operations conducted to install new flow monitoring equipment or from start-up of a pretreatment air stripper. No plant damage occurred, but access to the PTB was temporarily restricted. A fine was levied for this incident.
12/3/91	Allied Chemical	A solvent odor in the PTB initiated an investigation of the Allied Chemical discharge. The material released was believed to be cumene. The cumene is suspected to have migrated into the sewer during heavy rains from a subsurface release.

discussion of the basis for the projections. However, PWD has not included the basis for projections in the annual report submission.

A hydraulic overload condition is identified by a comparison of the measured average daily flow with the average daily flow upon which the permit and plant design are based. The plant design criteria are included in Appendix J, Basis of Design for Water Pollution Control Plants. An overload condition exists when the recorded monthly average daily flow exceeds the permit and monthly design average daily flow for each month of a contiguous three-month period, or when the flow in any portion of the system exceeds its hydraulic carrying capacity, thus causing a bypass. The average daily flows for the 1992 fiscal year from July 1991 through March 1992 are presented in Table 4.3.3. As can be seen in this table, the average daily flows have recently been below the plant design flow.

An organic overload occurs when the average daily organic load exceeds the organic load capacity upon which the plant was designed. A comparison of the recorded BOD_5 loading at the plant versus the design BOD_5 loading can indicate whether the plant is overloaded.

The plant design BOD_5 loading is 510,000 pounds per day based upon an initial design concentration of 245 mg/l at a flow of 250 mgd; subsequently, the SPDC design was based upon a projected loading of 350,000 pounds per day at a flow of 210 mgd or 200 mg/l. The average daily BOD_5 loadings recorded for fiscal year 1991 are presented in Table 4.3.4, along with the flow and BOD_5 in mg/l. These values are consistently below the plant design loading. Projected values of the flow and organic loading are provided in Chapter 5.0.

4.3.1.5 NEWPCP Treatment Process Description

NEWPCP provides primary and secondary treatment for the raw wastewater entering the plant. This treatment is accomplished by passing the wastewater through a series of unit processes. Each designed to treat the flow so that the effluent ultimately meets the discharge criteria. A site plan of the NEWPCP which illustrates each of the unit operations is presented in Figure 4.3-1. Table 4.3.5, NEWPCP Process Evaluation Summary, provides a summary of the plant design criteria. The following discussion describes each unit process.

Wastewater Collection

The raw wastewater enters the plant from three collection system interceptors, including the Frankford High Level Interceptor, Somerset/Frankford Low Level Interceptor, and the Delaware Low Level Interceptor. The average influent flow from each interceptor for the month of April 1992 was 54 mgd, 36 mgd and 97 mgd, respectively.

Screening

The influent wastewater passes through bar screens that remove large suspended or floating objects in the wastewater. At NEWPCP, the bars are designed with one inch of clear space. Rakes are automatically timed to travel up the bar screens to remove objects caught on the bar

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TABLE 4.3.3

FISCAL YEAR 1992 AVERAGE DAILY FLOWS FROM THE NEWPCP

Month/Year		Average Daily Flow (mgd)
July	1991	194.73
August	1991	198.77
September	1991	200.81
October	1991	197.99
November	1991	187.34
December	1991	205.17
January	1992	186.78
February	1992	184.59
March	1992	191.16
Average Flow		194.15

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TABLE 4.3.4

FISCAL YEAR 1991 AVERAGE DAILY BOD_5 LOADING TO THE NEWPCP

Month/Year		Plant BOD_5 Loading (lbs/day)	Flow (MGD)	BOD_5 (mg/l)
July	1990	232,348	214.39	147
August	1990	210,851	193.36	126
September	1990	201,604	212.81	163
October	1990	210,258	208.96	157
November	1990	244,979	205.72	156
December	1990	221,562	195.36	180
January	1991	215,427	203.39	182
February	1991	243,341	182.36	167
March	1991	274,660	200.81	174
April	1991	258,220	195.96	172
May	1991	251,034	191.72	158
June	1991	275,280	182.36	166
Average		236,630	198.93	164

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TABLE 4.3.5

NEWPCP PROCESS EVALUATION SUMMARY

Unit	Number	Dimensions	Existing Capacity	Design Parameter	NEWPCP Design Basis
Mechanical Sewage Screens	8	8 ft. channel width 1 inch bar spacing	1.70 cf/MG screenings removed	Bar spacing Velocity	1 inch 3.0 FPS minimum
Grit Removal	4	55' x 56'	6.4 cf/MG Grit removal	Velocity Maximum flow	---- 125 MGD each
Primary Sedimentation				Surface Loading	
Set 1	8	240' x 65 x 10' swd	105 MGD	Average	840 gpd/ft^2
Set 2	4	250' x 125' x 10' swd	105 MGD	Peak	---
				BOD removed	22.5%
Aeration Tanks	7	371'7" x 21'8" x 15' swd	23 MG - Total		
Rotating Biological Contractors	280	25'l x 12' diameter		Loading rate	7.5 gpd/ft^2
Final Sedimentation Tanks					
Set 1	8	214' x 75' x 11' swd	105 MGD	Design Surface Loading	815 gpd/ft^2
Set 2	8	231' x 70' x 13' swd	105 MGD	Rate	810 gpd/ft^2
				Weir loading	15,200 gpd/ft
Disinfection	6	300' x 28' x 11' swd	4.11 MG	Contact period	
				Average	35 minutes
				Peak	---
				chlorine dose	8 mg/l
Sludge Thickening	12	90' x 20' x 12' swd	237,600 ft^3	Solids loading	11.0 ppd/ft^2
				overflow rate	420 gpd/ft^2 (0.29 gpm/ft^2)
Sludge Digesters					
Set 1	8	110' diameter x 30' swd	17.95 MG	Side water depth	30'
				Volatile solids loading	99 lbs VSS/1,000 cf/day

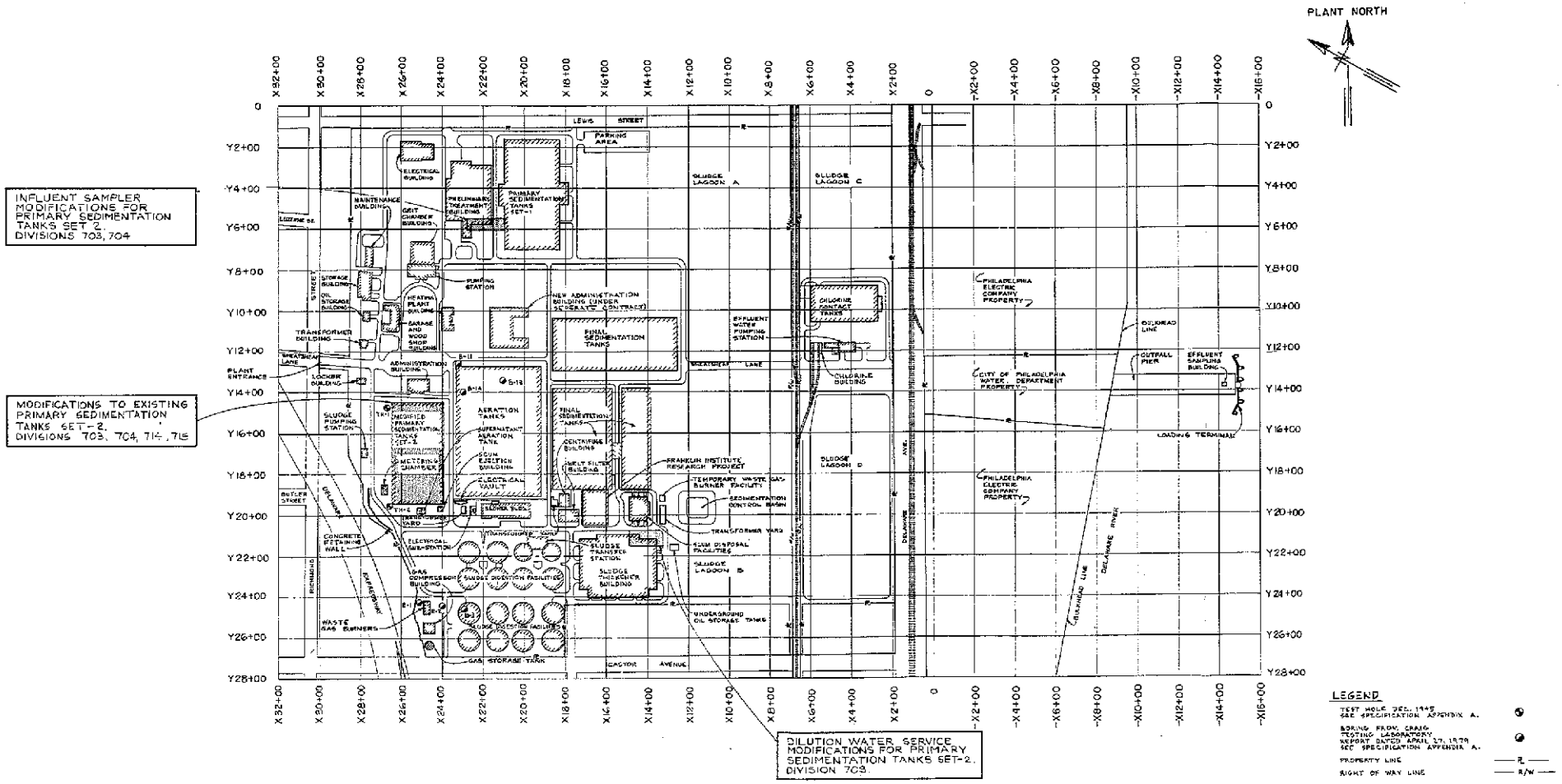

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Figure 4.3-1

Northeast Water Pollution Control Plant Site Plan

screens. There are six bar screens available for the low level interceptor influent and two available for the high level interceptor influent. A considerable amount of material is removed from the sewage flow in the screening process. For example, in April 1992, a total of 67,620 pounds of screenings were removed.

In the plant design, it was envisioned that the screenings would be incinerated onsite to reduce the volume of material requiring disposal. However, due to the large quantities of plastic material, and the potential for dioxin emissions from incineration, the screenings are not incinerated. Presently, they are combined with lime to reduce pathogen levels and vector attraction and then landfilled.

Influent Pumping

The low level interceptors (Delaware and Somerset/Frankford) are physically at a lower elevation than the plant's influent chamber. The wastewater is pumped to the elevation of the grit basins for subsequent treatment. Dry weather flow usually requires two pumps to be in operation. During increased flow periods, additional pumps are used. Six variable speed raw wastewater pumps are available.

Grit Removal

Grit consists of heavy mineral material present in the raw wastewater. Grit usually settles rapidly from the wastewater flow and can accumulate in channels or treatment tanks if it is not removed prior to treatment in these facilities. Furthermore, grit can be very abrasive to pumps or other mechanical equipment if it is not effectively removed during preliminary treatment.

At NEWPCP, four detriters are used to remove grit from the raw sewage. Two of the detriters are required to accommodate dry weather flow. After removal from the wastewater, the grit is pumped through hydrogritters and then conveyed into storage bins.

The collected grit is incinerated in two multiple hearth incinerators that are fueled from gas produced in the sludge digestion process. Usually one incinerator can accomplish the required grit reduction and the other incinerator is used as a backup. Fuel oil is used as a backup fuel, but there has been a limited requirement for operation using fuel oil.

During April 1992, 176.3 tons of grit were incinerated at a rate of 2.2 tons per hour. Approximately 92 tons of ash remained and were taken to a landfill for disposal.

Primary Sedimentation

Primary sedimentation removes floating and settleable material from the wastewater by allowing the wastewater velocity to be significantly reduced. This reduced velocity allows the floating material or scum to collect on the water's surface where it is collected and removed; likewise, heavier solids settle and accumulate as sludge on the bottom where it can be collected.

Two sets of primary sedimentation tanks are used at NEWPCP. The sets are similar in size, but one set has eight individual tanks and the other has four.

The sludge removed from the primary sedimentation tanks is further processed. Sludge is digested, stored, and sent to the Sludge Processing and Distribution Center (SPDC) for dewatering and composting.

Surface Aeration

NEWPCP utilizes a Surfact Aeration process that uses rotating biological contactors (RBCs) and fine bubble diffusion. The RBCs consist of rotating shafts with high density plastic discs attached to them. The discs rotate with the shaft and are approximately 40% submerged in the wastewater. The discs support a biological slime growth that utilizes organic matter in the wastewater for food and atmospheric oxygen to digest wastes in the wastewater.

The Surface Aeration process at NEWPCP uses 280 RBCs in seven aeration tanks with four channels in each tank. Additional oxygen is supplied by adding air to the aeration tanks through six blowers. This process operates in a step-feed mode. Primary sedimentation tank effluent is fed to the aeration tanks at multiple points in the tank. This mode of operation establishes several zones of high biological activity throughout the tank.

A portion of the sludge is recycled from the final sedimentation tanks to the aeration tanks. The recycled sludge ensures that a sufficient quantity of microorganisms is present to feed on organic material in the wastewater.

Final Sedimentation

The aeration process in the Surface Aeration System converts colloidal solids into settleable solids that have to be removed from the wastewater. Final sedimentation tanks provide an area of slow-flow velocity that allows the solids to settle and be removed. Additional floating material (scum) is also removed from the surface of the tanks.

At NEWPCP, the final sedimentation tanks are configured into two sets, with the first being equal in size to the second.

As mentioned above, a portion of the sludge collected in the final sedimentation tanks is recycled to the aeration tanks, and the remaining sludge is thickened, digested, then sent to SPDC to be dewatered and composted.

Chlorination

Chlorine is added to the plant effluent to disinfect and kill pathogens in the wastewater prior to discharge to the Delaware River. Chlorine is supplied in rail tank cars and added to the wastewater through solution feed chlorinators. Once the chlorine is added, the plant flow remains

in the chlorine contact tank from 20 to 30 minutes with an additional 10 minutes through the outfall.

Sludge Thickeners

Secondary sludge is thickened in 12 tanks by the Dissolved Air Flotation (DAF) process. Air is put into solution under pressure, added to the excess secondary sludge, and released in the tank at atmospheric pressure. The air attaches to the solid particles in the DAF tanks and floats these solid particles to the tank surface. The floating sludge is then skimmed off the top of the tank and sent to the sludge digesters through mixing chambers. Some sludge settles to the bottom of the DAF tanks. The settled sludge is also sent to the mixing chambers. All of the DAF tanks are similar in size and dimensions.

Sludge Digestion

Primary sludge and thickened secondary sludge is anaerobically digested to further reduce the organic content of the sludge, and methane gas is collected as a by-product of this process. The methane is used as a fuel to provide heat for various heating loops, the digesters and incinerate the grit collected in the detriters. The digestion tanks are kept at a temperature around 95°F to facilitate optimal digestion. NEWPCP utilizes 8 digesters with an average retention time of over 15 days.

Periodically, excess methane is produced and cannot be stored. Automatic flares ignite and burn the excess to reduce the potential for releasing offensive odors.

Sludge Storage and Transfer

Liquid digested sludge (biosolids) is transferred from NEWPCP to the SPDC by barge where it is dewatered and composted. Two storage tanks with a working volume of 1.5 million gallons are used for temporary storage. Each barge can transport one million gallons of sludge. Two are available to NEWPCP for sludge transfer. A barge load is sent to the SWWPCP on an average of six days per week.

4.3.1.6 Maintenance of Treatment Plant

A computerized preventive maintenance (PM) program assists maintenance personnel in the performance and tracking of maintenance activities. Preventive maintenance work orders are printed each week and distributed to work leaders for completion. Distribution on a weekly basis allows work leaders to prioritize the completion of emergency, corrective, and PM requirements.

Preventive maintenance schedules are based on manufacturers' recommended maintenance periods. However, it is possible to alter the schedule if historical records or worker insight indicate a need to change. Completed work orders are added to the historical files.

Corrective maintenance (CM) operations are initiated by filling out a work order request. Most work order requests are filled out by staff members of the Operations Group as they discover broken or inoperable equipment. Each CM request is categorized by priority and craft (electrical, mechanical, etc.) and assigned to a maintenance worker or team. The CM request is then processed by computer to issue a CM work order in the program's open work order file. Upon completion, the work order is added to the historical files.

The historical files can be used to track maintenance activities conducted on equipment and produce statistical reports of the maintenance conducted over time. The reports can be useful in determining if a piece of equipment has reached the end of its useful life by comparing maintenance versus replacement costs. Time budgeting can also be better estimated from records of past activities and performance.

4.3.2 Southeast Water Pollution Control Plant

4.3.2.1 Ownership

The Southeast Water Pollution Control Plant (SEWPCP) is owned by the City of Philadelphia and operated as a self-supporting utility by PWD. PWD is responsible for planning, construction, operation and maintenance, budgeting, detailed cost accounting, and setting sewer rates.

4.3.2.2 Point of Discharge

SEWPCP is permitted to discharge treated effluent to the Delaware River under NPDES Permit No. PA 0026662 (see Appendix H) from discharge point 001 located at latitude 75°08'09", longitude 39°54'07" (Delaware River Estuary Zone 3). Thirty-five (35) combined sewer overflow discharge points are also identified in the permit. These discharge points are necessitated by stormwater intermittently entering the sewer system and exceeding the hydraulic capacity of the sewer and/or wastewater treatment plant. The combined sewer overflow system is discussed in Section 4.2.5.

4.3.2.3 SEWPCP Effluent Discharge Limitations

SEWPCP is regulated by an NPDES Permit that establishes plant effluent quantity and quality limitations. The current permit expired on September 22, 1991; however, provisions in the permit allow for continued operation of and discharge from SEWPCP after this date. All of the permit limitations remain in effect until a new permit is issued.

The permitted average monthly flow of discharged effluent is 112 mgd. The plant is permitted to provide treatment for a maximum design wastewater flow of 168 mgd (maximum daily average) and 224 mgd (peak) without causing treatment process upsets. Premature and avoidable sewer system overflows caused by throttling of the influent flow are prohibited.

A summary of the permit effluent limitations is presented in Table 4.3.6. Specific monitoring and effluent limits are established for BOD_5, suspended solids, first stage oxygen demand, fecal coliform, and pH. Other parameters (i.e., TKN, Chloroform) are required to be monitored but do not have specific discharge limitations at this time. All parameters are reported to PADER, EPA, and DRBC in monthly DMRs.

DRBC has established an enforceable BOD_5 reduction requirement for discharges into Zone 3 of the Delaware River Estuary. The requirement includes an 86% monthly average reduction of BOD_5 from the influent to effluent. The percent reduction is calculated from analysis results of 24-hour composite samples of the influent and effluent. The influent sample must reflect true characteristics of the raw wastewater and must not be affected by plant recycle flows.

Exceedances of the permit limitations are reported to EPA, PADER and DRBC in the monthly DMRs. Over the past three years, there were exceedances in instantaneous maximum flow, suspended solids, solids percent removal and fecal coliform. Storm events and high sludge blankets caused most of the problems, but in some cases, plant operations were responsible. A detailed listing of these exceedances and causes thereof are shown in Appendix I.

Some other provisions that apply include requirements to operate an Industrial Pretreatment Program, management of toxic pollutants, and self-monitoring and reporting requirements.

4.3.2.4 Municipal Wasteload Management Reports (Chapter 94)

The plant design flow is 120 mgd, while the permitted average monthly effluent discharge limit is 112 mgd. The WPCP has a maximum daily average of 168 mgd and a 224 mgd peak flow. The average daily flow for the 1992 fiscal year from July through March are presented in Table 4.3.7. As can be seen in this table, the average daily flows are below the plant design flow except for the months of July, August and September.

The plant design loading is 196,000 pounds BOD_5 per day at the design flow rate of 120 mgd. This roughly converts to 196 mg BOD_5/l. Table 4.3.8 presents the average daily BOD_5 loading for each month in fiscal year 1991 along with the flow and BOD_5 calculated in mg/l. From this table it is apparent that most loadings are well below the plant's design except for April 1991.

4.3.2.5 SEWPCP Treatment Process Description

SEWPCP provides primary and secondary treatment for the raw wastewater entering the plant. The basic unit processes utilized to provide sufficient treatment to meet effluent limitations are presented in Figure 4.3-2. Table 4.3.9, SEWPCP Process Evaluation Summary, provides a summary of the plant design criteria. The primary function of each of the unit processes is explained in the following sections:

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TABLE 4.3.6

SEWPCP NPDES EFFLUENT LIMITATIONS FOR POINT SOURCE 001

Discharge Parameter	Discharge Limitations						
	Mass Units (lbs/day)			Concentration (mg/l)			
	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Instantaneous Maximum
BoD-5[1]	19,650	29,475		30	45		60
BoD-5 % Removals[1]	DRBC	Zone 4 Requirement		89.25% reduction			
Suspected Solids[1]	28,035	42,035		30	45		60
FSOD[2]	33,600						
Fecal Coliform (5/1 - 9/30)		See Footnote 3					
Fecal Coliform (10/1 - 4/30)		See Footnote 3					
pH	Within 6 - 9 Standard Units at all times						

[1]In no case shall the arithmetic means of the effluent values of the BOD_5 and Suspended Solids discharged during a period of 30 consecutive days exceed 14% and 15% respectively of the associated arithmetic means of the influent values for those parameters during the same time period, except as specifically authorized by the permitting authority.

[2]FSOD - First stage oxygen demand (20 day Biochemical Oxygen Demand test with nitrogenous oxygen demand inhibited).

[3]Effective disinfection to control disease producing organisms during the swimming season (May 1 through September 30) shall be the production of an effluent which will contain a concentration not greater than 200/100 ml of fecal coliform organisms as a geometric average value, nor greater than 1,000/100 ml of these organisms in more than 10% of the samples tested.

[4]Monitory only required for: NH_3-N, TKN, NO_3-N, NO_2-N, Total Beryllium, Dissolved Iron, Total Aluminum, Free Cyanide, Total Phenolics, Tetra-Chlorethylene, Phenol, Chlorodibrome-Methane, PLB 1260, Phenathrene, Chloroform, Total Cadmium, Total Lead, Total Mercury, Total Nickel, Total Silver, Total Zinc, Total Barium, Total Tin, and Total Titanium.

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TABLE 4.3.7

FISCAL YEAR 1992 AVERAGE DAILY FLOWS FROM THE SEWPCP

Month/Year		Average Daily Flow (mgd)
July	1991	113.93
August	1991	124.87
September	1991	115.71
October	1991	104.72
November	1991	103.07
December	1991	108.97
January	1992	104.10
February	1992	106.28
March	1992	109.00
Average Flow		110.07

Source: Monthly WPC Operations Report, May 5, 1992.

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TABLE 4.3.8

FISCAL YEAR 1991 AVERAGE DAILY BOD_5 TO THE SEWPCP

Month	Year	Plant BOD_5 Loading (lbs/day)	Flow (MGD)	BOD_5 (mg/l)
July	1990	46,426	109.15	51
August	1990	45,570	109.28	50
September	1990	63,896	104.95	73
October	1990	64,304	98.85	78
November	1990	71,934	102.68	84
December	1990	68,053	99.51	82
January	1991	62,318	103.78	72
February	1991	71,749	103.65	83
March	1991	88,001	107.67	98
April	1991	72,526	107.36	81
May	1991	61,867	109.09	68
June	1991	67,249	118.58	68
Average		65,324	106.21	74

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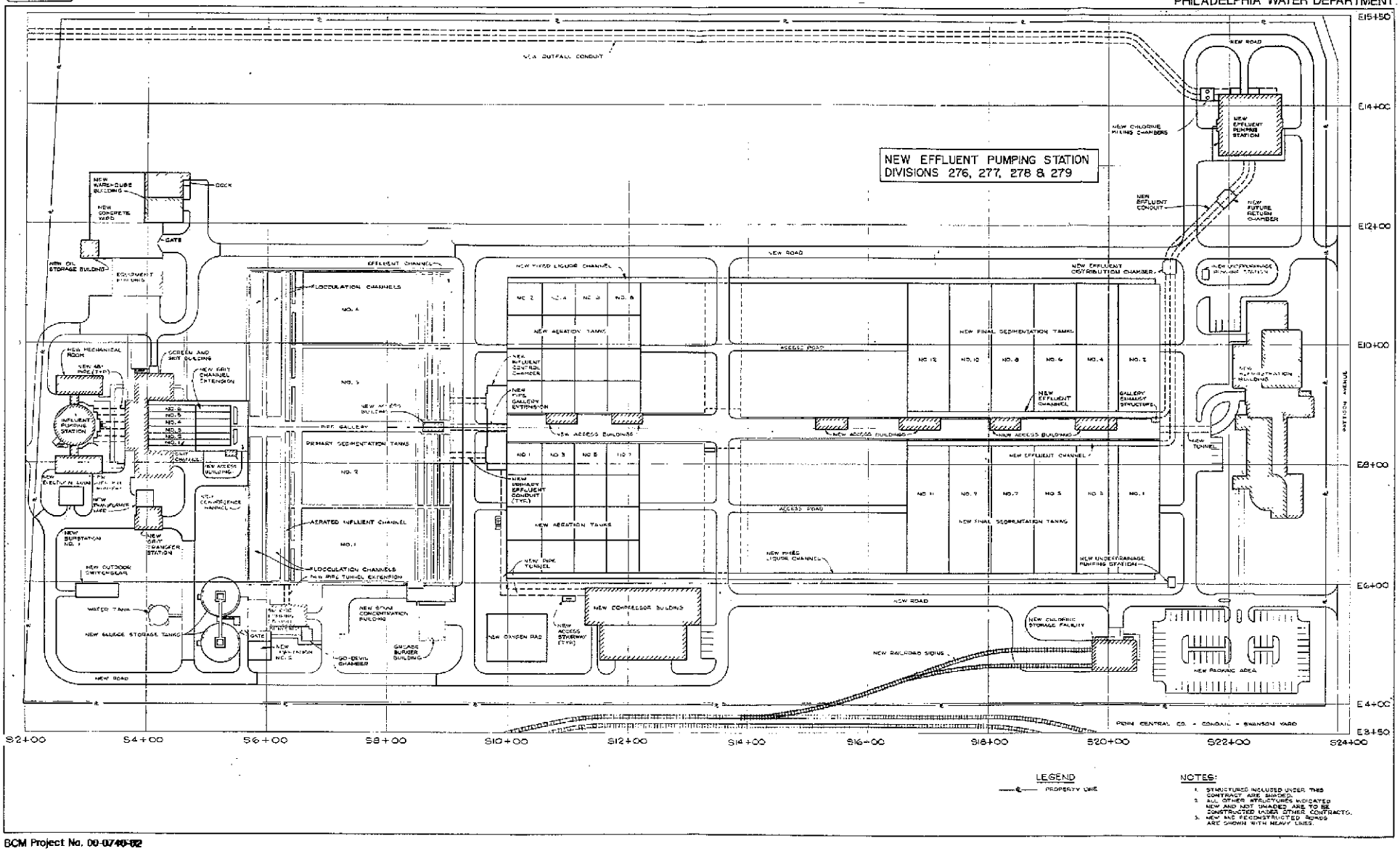

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Figure 4.3-2

Southeast Water Pollution Control Plant Site Plan

TABLE 4.3.9

SEWPCP PROCESS EVALUATION SUMMARY

Unit	Number	Dimensions	Existing Capacity	Design Parameter	SEWPCP Design Basis
Mechanical Sewage Screens	6	8.5' channel width 1 inch bar spacing	0.85 ft^3/MG screenings removed	Bar spacing Velocity	1 inch 2.3 FPS maximum
Grit Removal	5	10W x 140'L	3.7 ft^3/MG Grit removal	Velocity	----
Primary Sedimentation	4	250' x 125' x 12' swd	---	Surface loading Average Peak BOD removed Wier loading	 960 gpd/ft^2 --- 40% 4,700 gpd/ft
Aeration Tanks	8	210 x 52.5' x 14.3 swd	---	Minimum retention period	1.9 hours
				Maximum organic loading	93.5 lbs BOD_5/1000 ft/day
				FM ratio	---
				MLSS	4,000 mg/l
				Dissolved oxygen	---
				Return sludge rate	---

TABLE 4.3.9 (Continued)

Unit	Number	Dimensions	Existing Capacity	Design Parameter	SEWPCP Design Basis
Final Sedimentation Tanks	12	214' x 68' x 11' swd	---	Design Surface Loading	
				Average	685-1030 gpd ft^3
				Peak	---
				Wier loading	12,700 gpd/ft
				Hydraulic loading	
				Average	---
				Peak	---
				Solids loading	
				Average	---
				Peak	---
Disinfection	---	214' x 68' x 11' swd	---	Contact period	
				Average	37.2 minutes
				Peak	18.9 minutes
				chlorine dose	8 mg/l

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Coarse Screening

Two mechanically cleaned bar racks are located in the sewer influent channels in the influent pumping station. The bar racks have 4-inch clear opening screens to remove large objects that could damage the pumps. Rakes that are activated by a timer or a differential water level, remove the debris that collects on the bars upward to the screen room. The debris is first collected in hoppers and then transferred into trucks for transport and disposal.

Influent Pumping

The sewers and interceptors conveying wastewater to the SEWPCP are physically below the treatment plant. Influent pumping is required to bring the raw wastewater up to a diversion chamber and ultimately through the treatment plant.

Influent Screening and Grit Removal

Wastewater flow can be diverted into any of six channels in the screen and grit building from the diversion chamber. Channels are placed in service as required to meet the rate of influent flow. The efficiency of grit removal is dependent on the flow velocity in these channels. If the velocity is too high, grit will remain suspended and be carried through the grit channels. If the velocity is too low, organic material will settle with the grit and potentially cause odor problems. When the velocity of the flow is in the optimum range, only heavy inorganic material such as sand and gravel is removed.

The settled grit and other material is collected by flights that transverse the bottom of the channel. The grit is removed from the bottom of the chamber to a horizontal belt conveyor located in the screen room. The belt conveyor collects the grit from the six screw conveyors and transfers it to pneumatic transporters. The transporters automatically transport the grit to storage bins when they are full. The storage bins are handled to the Southwest WPCP (SWWPCP) where the grit is combined with lime and disposed of.

Mechanically cleaned catenary bar screens are located before each grit channel to remove objects larger than the 1-inch clear space openings between each bar. Mechanical rakes are activated by a timer or a significant difference in water level across the bar screens. The rakes lift the screenings to the screen room and deposit them on a screening trough. The screenings are manually removed and placed into containers where they are combined with lime and trucked to a landfill.

Each of the six grit channels can be taken out of service for cleaning and maintenance by closing the sluice gates at both ends of the channel.

Flocculation Channels

Wastewater exiting the grit channels can be diverted into either or both of the east and west flocculation channels. Wastewater is aerated in the flocculation channels to gently agitate the flow and promote the formation of larger particles through the collision and adherence of smaller

particles. Larger and heavier particles generally have an increased settling and removal efficiency in primary sedimentation. Aeration also reduces the possibility of a septic condition and promotes separation of scum, grease, and other floating material.

The west flocculation chamber feeds primary sedimentation tanks one and two, and the east flocculation chamber feeds tanks three and four. Each flocculation channel can be isolated and drained for maintenance.

Primary Sedimentation

Wastewater flows from the flocculation channels into the primary sedimentation tank influent channel. The influent channel is aerated to reduce deposition of sludge in this channel. The wastewater enters the primary sedimentation tanks over weirs and under sluice gates. Settled sludge is collected by longitudinal collectors in the cross collector channel located on the influent end of the tanks. The longitudinal collectors remove the sludge off the bottom of the tank and push the floating scum in the opposite direction, to the effluent end of the tanks. The sludge in the cross collector channel is conveyed to a sump in the channel. Sludge is then pumped from the sump to the sludge wet well in the sludge pumping station.

The scum and other floatables are removed by periodically opening slide gates that allow the scum to flow over a fixed weir into the scum collection trough. The scum then flows into channels and to scum ejectors in the scum concentration building. Each primary sedimentation tank has seven scum slide gates and a scum collection trough.

Aeration

The effluent from the primary sedimentation tanks enters the aeration tanks and is mixed with return activated sludge. There are eight aeration tanks, each having four stages. The wastewater and sludge are mixed with pure oxygen above the liquid surface through the use of mechanical mixers in each of the four stages. The activated sludge contains microorganisms that utilize organic material in the wastewater for food. The wastewater and sludge mixture travels in a serpentine pattern through the four stages of the aeration tank to the effluent weir. The aerated wastewater then flows to the final sedimentation tanks.

A portion of the activated sludge is collected from the final sedimentation tanks and returned to the aeration tanks. The rate of sludge return is determined by a complex relationship involving the wastewater flow, BOD_5, temperature, mixed liquor, suspended solids, and sludge level in the final sedimentation tanks.

Pure oxygen is provided to the aeration tanks from two cryogenic oxygen generation plants. The plants remove the contaminants and minor components of air and distill the oxygen. The plants are each capable of producing 50 tons per day of gaseous oxygen. The oxygen feed rate to the aeration tanks is controlled to maintain a preset pressure in the oxygen header supply line.

Final Sedimentation

The final sedimentation tanks receive the mixed liquor effluent from the aeration tanks. The final sedimentation tanks provide an area of slow flow velocity that allows the solids to settle and be removed. Longitudinal cross collectors push the settled sludge from both the influent and effluent ends of the tank toward a cross collector channel in the center. Cross collectors scrape sludge in this channel toward a sludge sump. The sludge is either returned to the aeration tanks or wasted to the sludge storage tanks and eventually pumped to SWWPCP.

Scum and floating solids are removed from both the influent and effluent ends of the final sedimentation tanks. The scum is collected and transferred through scum header channels to pumps that convey it to the scum concentration building. After concentration, the scum is incinerated in a grease burner.

Effluent Pumping

Due to the tidal influence on the Delaware River, the effluent from the plant must be periodically pumped into the river. To prevent river water from entering the effluent channel, tide gates close when the water level of the river exceeds the elevation of the plant effluent. Under these circumstances, the effluent must be pumped out of the WPCP. At low tides, the effluent can flow by gravity into the river.

Chlorination

Disinfection of the plant effluent prior to discharge occurs in the effluent channel. Chlorine is delivered to the plant in rail cars. Liquid chlorine is pumped from the rail cars to evaporators where it is vaporized. The chlorine gas is mixed with water by injectors to produce a chlorine solution. The chlorine solution is piped to the chlorine mixing chambers in the effluent channel where it is mixed with the effluent by diffusers and flash mixers. The retention time in the effluent channel provides sufficient contact time for disinfection. The rate of chlorine feed is controlled on the basis of chlorine residual and plant flow.

Sludge Storage and Pumping

Primary sludge is pumped to the wet well in the sludge pumping station from the primary sedimentation tanks. The sludge is normally stored in the primary sedimentation tanks until it is pumped to SWWPCP for processing. In an emergency, primary sludge can be removed from the sedimentation tanks and pumped into sludge storage tanks.

Pumping the primary sludge to SWWPCP is done on an intermittent basis. The sludge is pumped through one of two eight-inch force mains. One of the mains is dedicated for primary sludge and the other for waste activated sludge. Either pipeline can be used if one is out of service. Normally pumping of primary sludge takes precedence. After primary sludge pumping is completed, the primary sludge pipeline is flushed with waste activated sludge.

Waste activated sludge is pumped from the storage tanks on a continual basis and transferred through the dedicated force main to SWWPCP for thickening and digestion.

4.3.2.6 Maintenance of Treatment Plant

The SEWPCP utilizes state-of-the-art equipment to perform predictive maintenance investigations on critical components throughout the plant. The predictive maintenance investigations involve vibrational, infrared, and oil analysis on the components where applicable. Vibrational analysis can be used on moving equipment to determine if bearings are worn, if shafts are true, or if rotating equipment is properly balanced. Infrared analysis can be used to determine if components are operating at elevated temperatures. Oil analysis can indicate excessive wear of internal parts, oil breakdown, or whether the correct oil was used on a piece of equipment.

The predictive maintenance investigations are completed on a scheduled basis and can be used to identify potential maintenance requirements on components prior to a destructive breakdown. Predictive maintenance also allows scheduling of certain repairs so that the downtime of critical components can be planned. Equipment that has been rebuilt is also analyzed to ensure that the repairs have been completed correctly. Vibrational analysis of the major pieces of plant equipment is conducted monthly, and oil analysis is conducted on a quarterly basis.

Preventive maintenance (PM) work orders are generated from a computer program that follows manufacturer-recommended maintenance schedules unless alternate schedules have been developed. Preventive maintenance of grit channels, bar screens, primary tanks, and final tanks is scheduled for spring and fall. Work orders are issued and remain open until the work is completed.

Corrective maintenance (CM) is handled in the same manner as at NEWPCP.

Historical data on manpower requirements for completion of work orders is retained for use in next generation Maintenance Management System. The data cannot be used by the present system.

Innovative maintenance activities have resulted in a considerable cost and downtime savings at the SEWPCP. The equipment in the maintenance shop is frequently used to manufacture mechanical parts for wastewater treatment equipment and pumps. In-house machining has saved thousands of dollars over purchasing equivalent parts on the open market. An additional benefit of in-house machining is that a part is quickly available in comparison to obtaining the same part from commercial sources.

In addition, the use of synthetic oils has also proved beneficial. Synthetic oils can last considerably longer than refined oil, increasing the usable lifetime of the oil. Use of synthetic oils has also reduced friction on some parts and this has decreased energy costs.

Training of maintenance workers is an important part of the maintenance program. Trade training is frequently provided and helps ensure that workers perform assigned tasks correctly and efficiently. Safety training is also regularly provided to ensure that workers understand the hazards associated with their jobs and react correctly to emergency situations.

4.3.3 Southwest Water Pollution Control Plant

4.3.3.1 Ownership

The Southwest Water Pollution Control Plant (SWWPCP) is owned by the City of Philadelphia and operated as a self-supporting utility by the PWD. The PWD is responsible for planning, construction, operation and maintenance, budgeting, detailed cost accounting, and setting sewer rates.

4.3.3.2 Point of Discharge

SWWPCP is permitted to discharge treated effluent to the Delaware River (Zone 4 of the Delaware Estuary) from Point Source 001, which is located at latitude 39°52'08" and longitude 75°13'13". National Pollutant Discharge Elimination System (NPDES) effluent limitations have been established for this WPCP and outfall through permit No. PA 0026671. This permit is included in Appendix H.

Eighty three (83) combined sewer overflow discharge points are also identified in this permit. These discharge points serve as combined sewer reliefs, necessitated by the collection of stormwater and sanitary sewage in a combined system and act to prevent a hydraulic overload of the collection system and SWWPCP. These discharges do not have specific effluent limitations; however, a discharge is permitted only when the collection system and SWWPCP maximum hydraulic capacities have been reached.

4.3.3.3 SWWPCP Effluent Discharge Limitations

As mentioned above, SWWPCP has been issued an NPDES Permit for the plant effluent and is responsible for complying with the effluent quality and quantity limitations established in that permit. The permit under which SWWPCP is currently operating expired on September 22, 1991. Provisions in this permit allow continued operation of and discharge from SWWPCP. Permit limitations remain in effect until a new permit is issued, provided that a timely and complete permit application form has been filed. The permit application and applicable fees were transmitted PADER on March 21, 1991.

The permitted average monthly flow of effluent discharged from the WPCP shall not exceed 200 mgd. The plant is to be operated to provide treatment for the maximum design wastewater flow of 300 mgd (maximum daily average) and 400 mgd (peak) without causing treatment process upsets. Throttling of influent flows to SWWPCP resulting in premature and avoidable sewer system overflows is prohibited.

A summary of the effluent limitations is presented in Table 4.3.10. The permit establishes specific monitoring requirements and effluent limits for BOD_5, suspended solids, first stage oxygen demand, fecal coliform, and pH. Other parameters (i.e., TKN, Iron) are required to be monitored but do not have specific discharge limitations at this time. All parameters are reported in monthly DMRs submitted to PADER, EPA, and DRBC.

DRBC has established enforceable BOD_5 limitations for Zone 4 of the Delaware River Estuary, into which the SWWPCP discharges. The requirement includes an 89.25% monthly average reduction of BOD_5 from the influent to effluent. The percent reduction is calculated from analysis results of 24-hour composite samples of the influent and effluent. The influent sample must reflect the true characteristics of the raw wastewater and must not be affected by the plant recycle flows.

Exceedances of the permitted effluent quantity and quality limits are reported to EPA, PADER, and DRBC in the monthly DMRs. Problems with the cryogenic oxygen plant and other plant operations were the cause for most of the exceedances at SWWPCP. High flows and sludge washout caused some of the problems, and in some cases, weak BOD_5 influent level have resulted in decreased BOD_5 percent removal. A detailed listing of these exceedances and the causes thereof are shown in Appendix I.

Some other permit provisions that apply include requirements to operate an IPP, manage toxic pollutants, and self-monitor and report submittal requirements.

In addition to the NPDES permit requirements, SWWPCP is currently operating under the requirements of a Consent Decree due to violations of the Clean Water Act. The Consent Decree established requirements to rehabilitate select pieces of major equipment, a schedule for this rehabilitation effort, and minimum operational standards to define the completion of this rehabilitation effort. The Consent Decree also established interim effluent limits that were valid through December 31, 1990. Furthermore, the Consent Decree required the City to hire an independent consultant to identify factors that have limited performance at SWWPCP, to develop a sequenced program for corrective actions that will result in NPDES permit compliance, and to produce periodic reports monitoring the progress of the program.

The SWWPCP has achieved compliance with the rehabilitation schedule and the interim permit limitations. The sequenced program for corrective actions has also been developed. Several of the program provisions have been implemented; however, the schedule for completion for the entire program extends into 1993.

4.3.3.4 Municipal Wasteload Management Reports (Chapter 94)

The plant design flow is 210 mgd, while the permitted average monthly effluent discharge limit is 200 mgd. The SWWPCP has a maximum daily average of 300 mgd and a 400 mgd peak flow. The average daily flows for the 1992 fiscal year from July 1991 through March 1992 are presented in Table 4.3.11. As can be seen in this table, the average daily flows have been below the plant design flow, except in July and August of 1991.

TABLE 4.3.10
SWWPCP NPDES EFFLUENT LIMITATIONS FOR POINT SOURCE 001

BCM

Discharge Parameter	Discharge Limitations						
	Mass Units (lbs/day)			Concentration (mg/l)			
	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Instantaneous Maximum
BoD-5[1]	21,650	32,475		30	45		60
BoD-5 % Removals[1]	DRBC	Zone 4 Requirement		89.25% reduction			
Suspected Solids[1]	50,040	75,060		30	45		60
FSOD[2]	37,020						
Fecal Coliform (5/1 - 9/30)		See Footnote 3					
Fecal Coliform (10/1 - 4/30)		See Footnote 3					
pH	Within 6 - 9 Standard Units at all times						

[1]In no case shall the arithmetic means of the effluent values of the BOD_5 Suspended Solids discharged during a period of 30 consecutive days exceed 10.75% and 15% respectively of the associated arithmetic means of the influent values for those parameters during the same time period, except as specifically authorized by the permitting authority.

[2]FSOD - First stage oxygen (20 day Biochemical Oxygen Demand test with nitrogenous oxygen demand inhibited).

[3]Effective disinfection to control disease producing organisms during the swimming season (May 1 through September 30) shall be the production of an effluent which will contain a concentration not greater than 200/100 ml of fecal coliform organisms as a geometric average value, nor greater than 1,000/100 ml of these organisms in more than 10% of the samples tested.

[4]Monitor only required for: NH_3-N, TKN, NO_3-N, NO_2-N, Aluminum, Dissolved Iron, Total Silver, Total Zinc, Total Phenotics, Total Tin, and Total Titanium.

BCM

TABLE 4.3.11

FISCAL YEAR 1992 AVERAGE DAILY FLOWS FROM THE SWWPCP

Month	Year	Average Daily Flow (mgd)
July	1991	213.88
August	1991	209.17
September	1991	206.83
October	1991	193.75
November	1991	193.17
December	1991	206.25
January	1992	191.81
February	1992	178.59
March	1992	202.65
Average		199.57

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The plant design BOD_5 loading is 339,000 pounds per day at a flow of 210 mgd or 193 mg/l. The average daily BOD_5 loadings for fiscal year 1991 are presented in Table 4.3.12, along with the flow and BOD_5 in mg/l. These values are consistently below the plant design loading except for April 1991.

4.3.3.5 SWWPCP Treatment Process Description

SWWPCP provides primary and secondary treatment for the raw wastewater entering the plant. The treatment is accomplished by passing the wastewater through a series of unit processes, each designed to treat the flow so that the effluent ultimately meets the discharge criteria. A schematic of the treatment processes utilized at the SWWPCP which illustrates each of the unit operations is presented in Figure 4.3-3. Table 4.3.13, SWWPCP Process Evaluation Summary, provides a summary of plant design criteria. The following paragraphs describe each unit process.

Wastewater Collection

Raw wastewater arrives at the plant in high level and low level interceptors as described in Section 4.2.2. The high level interceptors deliver wastewater to the dispersion chamber just ahead of the bar screens. The high level interceptors consist of a triple barrel gravity sewer and a force main. The low-level interceptors consist of twin conduits that enter the influent pumping station 35 feet below the operating level of the dispersion chamber. The plant drainage also discharges into the influent pumping station.

Influent Pumping

The raw wastewater from the plant drain and low level interceptors is lifted to the dispersion chamber by three two-stage screw pumps. Each pump is in a separate channel and can be isolated from the inlet structure by a slide gate. Each screw pump has a capacity of 32 mgd. Pumps are utilized as the influent flow requires. Two manually cleaned coarse screens are located in the inlet structure to prevent large debris from entering the pumps.

Dispersion Chamber

Wastewater flow from the high level interceptors and that pumped from the low level interceptors and plant drain are combined in the dispersion chamber. The dispersion chamber is equipped with sluice gates and butterfly valves to allow a bypass of the screening and grit removal systems in the event of an emergency.

BCM

TABLE 4.3.12

FISCAL YEAR 1991 AVERAGE DAILY BOD_5 LOADING TO THE SWWPCP

Month/Year		Plant BOD_5 Loading (lbs/day)	Flow (MGD)	BOD_5 (mg/l)
July	1990	157,299	186.74	101
August	1990	164,307	195.06	101
September	1990	150,012	178.09	101
October	1990	142,751	169.47	101
November	1990	135,078	160.36	101
December	1990	147,957	175.65	101
January	1991	160,777	190.87	101
February	1991	144,849	171.96	101
March	1991	157,105	186.51	101
April	1991	159,489	189.34	101
May	1991	154,173	183.03	101
June	1991	155,024	184.04	101
Average		152,402	180.93	101

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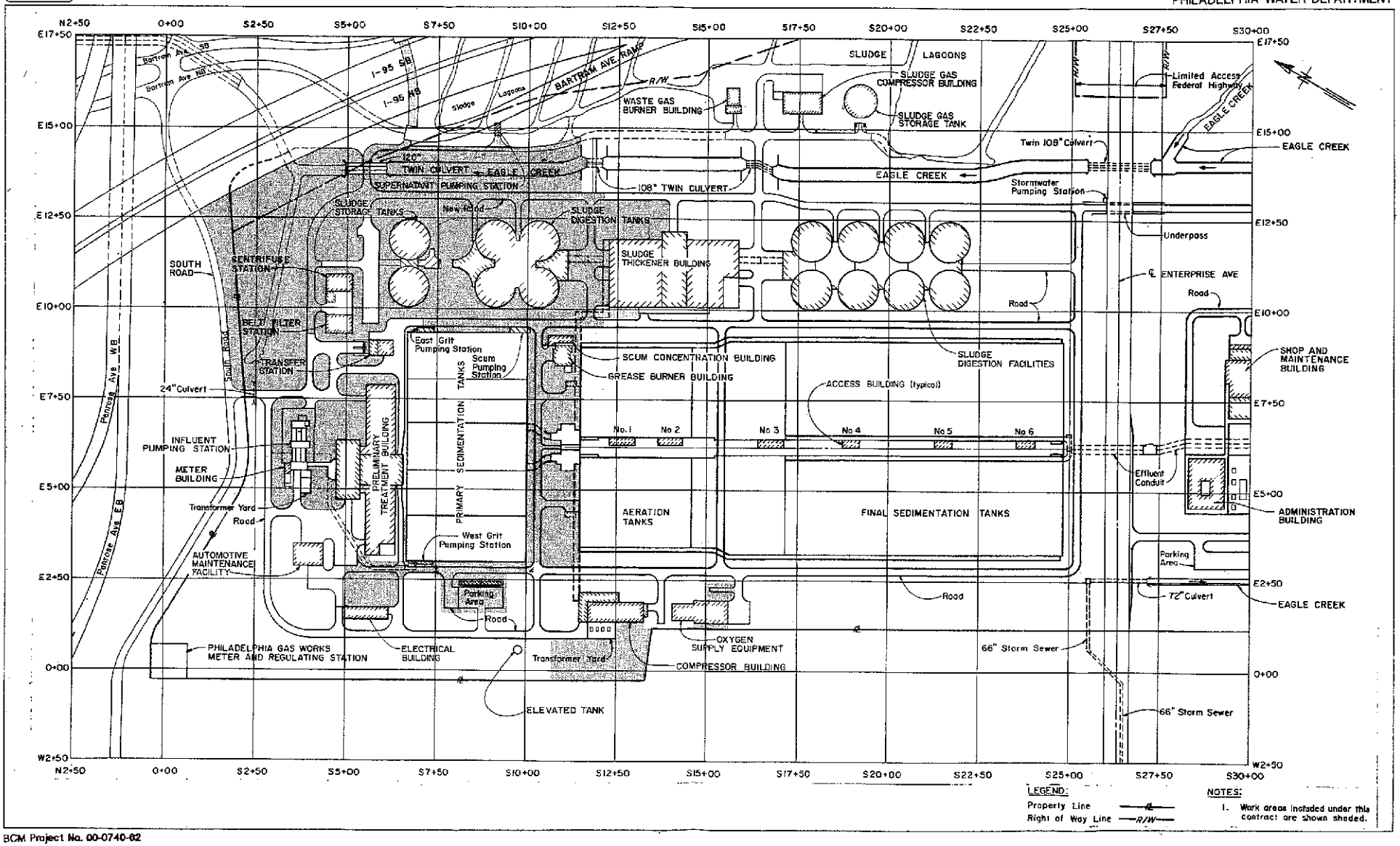

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Figure 4.3-3

Southwest Water Pollution Control Plant Site Plan

TABLE 4.3.13

SWWPCP PROCESS EVALUATION SUMMARY

Unit	Number	Dimensions	Existing Capacity	Design Parameter	SWWPCP Design Basis
Mechanical Sewage Screens	8	6' channel width	570 MGD	Bar spacing Maximum velocity	1 inch 3.2 FPS
Grit Removal	4	60' x 60'	5.20 ft^3/MG	Velocity	----
Primary Sedimentation	5	250' x 125' x 12' swd	210 MGD	Surface Loading Average Peak BOD removed Wier loading	 1,350 gpd/ft^2 --- 25% 45,700 gpd/ft
Aeration Tanks	10	14,500 ft^2 x 16' swd	210 MGD	Minimum retention period	1.96 hours (wastewater flow)
				Maximum organic loading	106 lbs BOD_5/1000 ft/day
				FM ratio	0.45 lbs BOD_5/lbs MLVSS/day
				MLSS	4,900 mg/l
				Dissolved oxygen	---
				Return sludge rate	---

TABLE 4.3.13 (Continued)

Unit	Number	Dimensions	Existing Capacity	Design Parameter	SWWPCP Design Basis
Final Sedimentation Tanks	20	76' x 260' x 11' swd	210 MGD	Design Surface Loading Average Peak Wier loading Hydraulic loading Average Peak Solids loading Average Peak	 530-795 gpd ft^3 --- 12,800 gpd/ft --- --- --- ---
Disinfection				Contact period Average Peak chlorine dose	 32.8 minutes 24.5 minutes 8 mg/l
Sludge Thickening	8	18' x 70' x 8' swd		Solids loading Overflow rate	17 lbs/day/ft^2 ---
Sludge Digesters	8	110' diameter x 30' swd	373,000 lbs/day	Side water depth Volatile solids loading	30' 88 lbs VSS/1,000 cf/day

Screening

Wastewater normally flows from the dispersion chamber into six mechanically cleaned bar screens. The bar screens have 1-inch clear space openings between bars. The screens are automatically cleaned by mechanical rakes that are activated by a timer or differential water level around the screens. The rakes remove the screenings and deposit them on storage trays at the far end of the screens.

The screenings are raked onto a conveyor that transports them to one of two grinders. A wet spray carries the screenings through the grinders that discharge to a dewatering screen. From the dewatering screen, the ground screenings fall onto a conveyor and are carried to pneumatic ejectors that transfer the screenings to storage bins. The screenings were originally intended to be incinerated but are now limed and landfilled.

Each of the six screens can be isolated by sluice gates at the inlet and outlet. Screens are taken in and out of service by opening or closing the sluice gates. The number of screens in operation at any time is a function of the total plant flow.

Grit Removal

From the screen channels, the wastewater flows to four grit basins for removal of heavy mineral material. Each tank is equipped with a rotating collector that scrapes the settled grit into a collection sump for removal. The grit collected in the sump is moved by screw conveyors to a grit pump. The grit is pumped to hydrogritters to remove water and then conveyed to storage bins for subsequent incineration.

Each grit basin can be isolated by influent and effluent sluice gates. Grit basins are placed in and out of service depending upon the total plant flow.

Flocculation Channels

Wastewater exiting the grit basins can be diverted into either or both of the east and west flocculation channels. Wastewater is aerated in the flocculation channels to gently agitate the water and promote the formation of larger particles by collision and adherence of smaller particles. Larger and heavier particles generally have an increased settling efficiency in primary sedimentation. Aeration also reduces the possibility of a septic condition and promotes separation of scum, grease, and other floating material.

The east flocculation chamber feeds primary sedimentation tanks one, two, and five, and the west flocculation chamber feeds tanks three and four. Each flocculation channel can be isolated and drained for maintenance.

Each flocculation channel is equipped with a grit collection sump, screw conveyor, and grit pump for grit removal. Grit is removed by draining the flocculation chamber and using high pressure hoses to move the grit to the collection sump. From the sump, the grit is moved by a screw

conveyor and then pumped to the grit dewatering facilities and storage bins in the preliminary treatment building.

Primary Sedimentation

Wastewater flows from the flocculation channels into the primary sedimentation tank influent channel. The influent channel is aerated to reduce deposition of sludge in the channel. The wastewater enters the primary sedimentation tanks over weirs and under sluice gates. Settled sludge is collected in the cross collector channel located on the influent end of the tanks by longitudinal collectors. The collectors scrape the sludge off the bottom and move the floating scum in the opposite direction, to the effluent end of the tanks. The sludge in the cross collector channel is removed by cross collectors to a sump in the channel. Sludge is then pumped from the sump to the sludge thickening building.

The scum and other floatables are removed by periodically opening slide gates that allow to the scum flow over a fixed weir into the scum collection trough. The scum then flows into channels and to scum ejectors in the scum concentration building. Each primary sedimentation tank has seven scum slide gates and a scum collection trough.

Aeration

The effluent from the primary sedimentation tanks enters the covered aeration tanks and is mixed with return activated sludge. The wastewater and sludge are aerated with pure oxygen injected by mechanical mixers. The activated sludge contains microorganisms that utilize organic material in the wastewater for food. The wastewater and sludge mixture travels in a serpentine pattern through four stages of the aeration tank to the effluent weir. The aerated wastewater then flows to the final sedimentation tanks.

A portion of the activated sludge is collected from the final sedimentation tanks and returned to the aeration tanks. The rate of sludge return is determined by a complex relationship involving the wastewater flow, BOD_5, temperature, mixed liquor suspended solids, and sludge level in the final sedimentation tanks.

Pure oxygen is provided to the aeration tanks from two cryogenic oxygen generation plants. The plants remove the contaminants and minor components of air and distill oxygen. The plants are each capable of producing 90 tons per day of gaseous oxygen. The oxygen feed rate to the aeration tanks is controlled to maintain a preset pressure in the oxygen header supply line.

Final Sedimentation

The final sedimentation tanks receive the mixed liquor effluent from the aeration tanks. The aeration process converts additional suspended solids into a settleable form to be removed. The final sedimentation tanks provide an area of low flow velocity that allows the solids to settle and be removed. Longitudinal cross collectors scrape the settled sludge from both the influent and effluent ends of the tank into a cross collector channel in the center of the tanks. Sludge is then

removed via a sludge sump. The sludge is either returned to the aeration tanks or wasted to the sludge thickening facilities.

Scum and floating solids are removed from both the influent and effluent ends of the final sedimentation tanks. The scum is collected and transferred through scum header channels to pumps that convey it to the scum concentration building. After concentration, the scum is incinerated in a grease burner.

Effluent Pumping

Due to the tidal influence on the Delaware River, the effluent from the plant periodically must be pumped into the river. To prevent river water from entering the effluent channel, tide gates close when the water level of the river exceeds the elevation of the plant effluent. Under these circumstances, the effluent is pumped out of the WPCP. At low tides, the effluent flows by gravity into the river.

Chlorination

Disinfection of the plant effluent prior to discharge occurs in the effluent channel. Chlorine is delivered to the plant in rail cars. Liquid chlorine is pumped from the rail cars to evaporators where it is vaporized. The chlorine gas is mixed with water by injectors to produce a chlorine solution. The chlorine solution is piped to the chlorine mixing chambers in the effluent channel where it is mixed with the effluent by diffusers and flash mixers. The retention time in the effluent channel provides sufficient contact time for disinfection. The rate of chlorine feed is controlled on the basis of chlorine residual and plant flow. Measurements of chlorine residual and plant flow are used in a cascade control loop to adjust the chlorine feed rate.

Sludge Thickeners

Waste activated sludge from both SEWPCP and SWWPCP is thickened in eight tanks by these Dissolved Air Flotation (DAF) process. Air is added to the sludge/water (primary effluent) mixture in the mixing chamber. The air attaches to the sludge in the DAF tanks and carries it to the tank surface. The floating sludge is then skimmed off the top of the tank and sent to the sludge digesters. Some sludge settles to the bottom of the DAF tanks. The underflow sludge is returned to the air mixing chamber for reprocessing. All of the DAF tanks are similar in size and dimensions.

Sludge Digestion

The primary and thickened waste activated sludge is anaerobically digested to further reduce the organic content of the sludge, a process that produces methane gas. The methane is used as a fuel to provide heat for the digesters and incinerate the grit collected in the degriters. The digestion tanks are kept at a temperature of around 90°F for optimal sludge digestion. SWWPCP uses 16 digesters with an average retention time of over 15 days. The digested sludge is transferred to the SPDC by pipeline for dewatering and composting.

Periodically, excess methane is produced and cannot be stored. Automatic flares ignite and burn the excess to reduce the potential for releasing offensive odors.

4.3.3.6 Maintenance of Treatment Plant

Both the preventive maintenance (PM) and corrective maintenance (CM) programs at SWWPCP are computerized and scheduled as at the NEWPCP and SEWPCP. An insufficient supply of repair parts has limited PWD's ability to keep equipment operating. Emergency equipment repairs have resulted in using back-up equipment as a source of spare parts. Minimal preventive maintenance and crisis management of maintenance have resulted in a severe reduction in functioning equipment.

The Consent Decree has forced the focus of maintenance activities to be on the equipment itemized in the Decree, to set schedules for repair, and to establish minimum periods the equipment must be operational to be considered functioning. This focus on maintenance activities has substantially improved the operation of the itemized equipment. However, equipment not itemized has suffered from neglect and several pieces of major equipment have become inoperable.

The independent consultant retained to establish maintenance priorities has developed a strategy to improve maintenance operations, increase the repair parts inventory and assess non-compliance issues. The results of this effort have actually established additional Consent Decree obligations. The implementation of these programs is expected to drastically improve the operability and effectiveness of SWWPCP.

4.3.4 Sludge Processing and Distribution Center

4.3.4.1 Ownership

The Sludge Processing and Distribution Center (SPDC) is owned and operated by the PWD. The SPDC is designed to receive, process, and distribute the biosolids removed from the waste streams at the three WPCPs. By performing this operation, the SPDC is an integral part of the wastewater treatment process, providing a centralized unit process for this wastewater treatment operation.

The SPDC is permitted by the Bureau of Solid Waste Management, PADER and holds permit #101264. An application to renew this permit was submitted to PADER on 4/10/92 and is currently under review.

4.3.4.2 Process Description

Sludge is removed from wastewater at Philadelphia's three WPCPs at different points in the treatment process, producing primary and waste activated sludge. The waste activated sludge must be thickened and both the primary and thickened waste activated sludge must be digested prior to composting. Sludge from the Northeast and Southwest WPCPs is thickened and digested

at both of the treatment plants prior to transport to SPPC. SEWPCP does not have inherent thickening or digestion processes at the plant. Sludge from SEWPCP is pumped via two underground force mains to the SWWPCP for future processing. After digestion, the sludge from the SWWPCP (including SEWPCP sludge) is pumped to SPDC for dewatering and composting. Sludge from the NEWPCP is transported by barge to the SPDC. A site plan of the SPDC which illustrates the layout for the following processes is shown in Figure 4.3-4, SPDC, Site Plan.

Storage

At the SPDC, three storage tanks are available for temporary storage of the sludge. Currently, due to DDX contamination of NEWPCP sludge, it is completely segregated from SEWPCP/SWWPCP sludge in the storage and processing operations. Each storage tank holds approximately one million gallons of sludge. Two tanks are dedicated to SEWPCP/SWWPCP sludge.

Dewatering

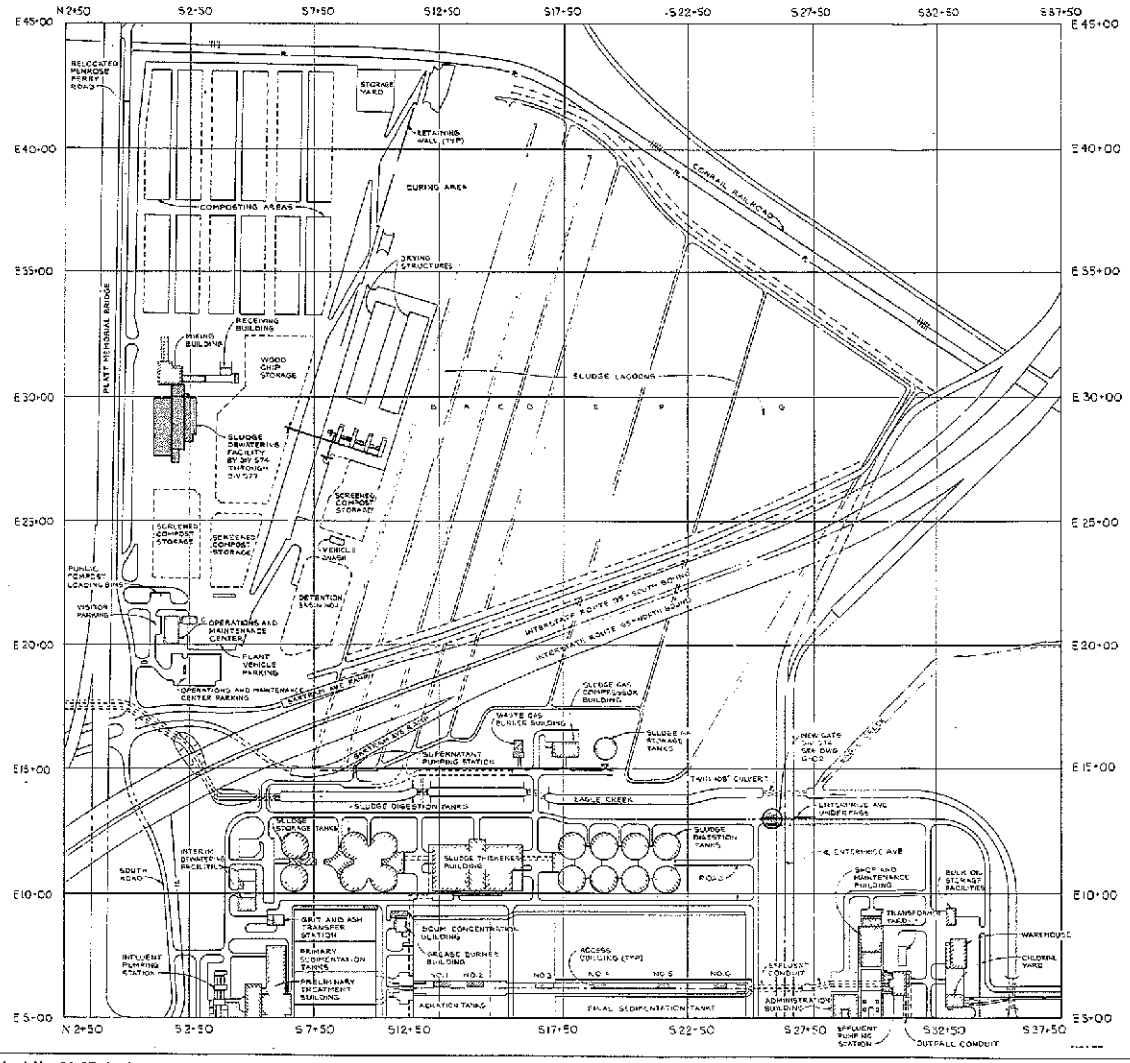
Dewatering is the principal means of sludge volume reduction. Dewatering is accomplished in 10 centrifuges that spin at high speed and separate the solids from the liquid centrate. The centrate is pumped back to SWWPCP for treatment with incoming wastewater. The solids removed from the centrifuge are called sludge cake.

The sludge cake produced by the centrifuges was originally intended to contain at least 20 percent solids. The current sludge cake solids concentration averages between 17 percent and 18 percent. The difference in percent solids results in a marked difference in the volume of sludge cake to be processed and also drastically increases the wood chip volume required to produce a compostable mixture. A higher percent solids in the sludge cake is desirable due to the reduced volume of mass to receive further processing and ultimate disposal.

Mixing

The mixing process uses pug mill mixers to combine the sludge cake and wood chips to produce a compostable mixture. A mixture containing too high a liquid content inhibits the formation of voids that are necessary for air transport through the sludge, thus preventing the aeration needed for the biological activity in composting and resulting in anaerobic conditions that produce offensive odors. Wet sludge requires a larger volume of wood chips to produce a compostable mix and is not economical.

Usually, a mixture of one part sludge and two parts wood chips produces the correct consistency for composting. Once mixed, the compost mixture is transported to the composting area for stockpiling.



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NOT TO SCALE

Figure 4.3-4

Sludge Processing and Distribution Center Site Plan

Composting

The sludge and wood chip mixture is placed on a bed of wood chips with aeration tubes embedded within the wood chips. The compost mixture is formed into large composting piles. The piles remain stockpiled for 21 days during which air is drawn through to enhance aerobic decomposition. During decomposition, the temperature inside the stockpiles rises to at least 130°F, which kills any pathogens still remaining in the sludge. After 21 days, the compost is relatively dry and ready for curing.

Curing

For curing, the composting piles are removed to the curing area, where the sludge is stockpiled for an additional 30 days. Curing allows further bacterial breakdown of the compost and continued drying of the composted mixture. Curing is conducted in uncovered piles without aeration.

Drying

After the 30 days, the cured sludge is moved again and stored on a covered pad. There it is further aerated to dry the cured compost and prepare the mixture for screening. The compost must be sufficiently dry for screening else or the trommel screens can clog.

Screening

The dried, cured compost is passed through rotating trommel screens to remove wood chips from the compost product. Eight trommel screens are used at the SPDC facility. The screened compost is the final processed product. The recovered wood chips are recycled and reused in the composting process.

4.3.4.3 Production and Distribution

Four products result from the composting procedure at the SPDC: Sludge cake, Mine mix, Phillymulch, and Earthlife. The characteristics and use for each are described below.

Sludge Cake - Sludge cake is dewatered sludge containing from 17 to 30% solids. Sludge cake is mainly used on farmland as a fertilizer, thus reducing the required quantities of chemical fertilizer. Sludge cake is used on farmland dedicated to the production of animal fodder rather than crops for human consumption.

Mine Mix - Mine mix consists of a mixture of one part composted sludge and one part sludge cake by volume. Mine mix is used to reclaim areas that do not support vegetation, such as strip mines. It has been used in western Pennsylvania to recover barren land, converting it to healthy green fields in a single growing season. Between 1978 and 1990, mine mix has been used to recover 3,900 acres of mined lands.

Phillymulch - Phillymulch is a composted, unscreened product that is used as a mulch to enrich ornamental gardens and for landscaping. It is not recommended for use in gardens for production of vegetables.

Earthlife - Earthlife is the composted, cured, dried, and screened product from SPDC. It is a fine soil enricher that is primarily used by plant nurseries and landscapers. It is offered for sale to the general public. Again, it is not recommended for use in vegetable gardens.

The rates of production for these different products are primarily determined by the expected markets. Extensive research and planning are conducted to determine the market needs for each product. The expected needs determine the quantity and production schedule for each. Production planning is usually conducted months in advance because the final compost product requires approximately two months to produce.

The utilization of composted sludge products is not the only driving force for production. The dewatering and processing of sludge is the ultimate purpose of the SPDC. The SPDC must process all of the sludge produced by the three WPCPs. Periodically, it is not feasible to process all of the sludge from the WPCPs due to mechanical malfunctions and/or hydraulic limitations. Hydraulically, there is a limit to the maximum capacity of the dewatering facilities, regardless of the solids concentration. This has affected the production of sludge at the WPCPs and resulted in sludge treatment and processing shutdowns. To reduce the hydraulic capacity limitation at the SPDC, it is necessary that a consistent high solids content sludge be produced at the WPCPs. Current studies are evaluating alternative means to produce a consistent sludge.

4.3.4.4 Maintenance

Preventive and corrective maintenance programs have been established to reduce or prevent long-term equipment outages. A computerized preventive maintenance (PM) program has been installed at the facility; however, its use has not been fully implemented. A calendar PM system is currently used to schedule and track PM activities.

Corrective maintenance (CM) activities are initiated by operations staff identifying inoperative or malfunctioning equipment. Repairs are made as craft workers, equipment, and parts become available.

4.4 INDUSTRIAL PRETREATMENT PROGRAM

4.4.1 General

The Philadelphia Industrial Pretreatment Program (IPP) was developed to enforce the Federal Prohibited Discharge Standards of the General Pretreatment Regulations (40 CRF 403), to implement the objectives of the National Pretreatment Program, and to control sludge quality. The purpose of these regulations is to prevent the introduction of incompatible pollutants into the wastewater system that may:

- Interfere with the operation of the treatment systems.
- Contaminate sludge and thus interfere with selected sludge uses or disposal practices.
- Pass through the system, inadequately treated, into receiving waters or the atmosphere.
- Cause the PWD to be in violation of its NPDES permit.
- Be otherwise corrosive to the sewer system.
- Create a hazard for workers in the treatment facility.

PWD adopted the Wastewater Control Regulations, effective June 1990, in response to the Federal Clean Water Act and the General Pretreatment Regulations, which include the following:

1. Enforcement of general requirements for all sewer system users as specified in a sewer use ordinance, in this case, the City of Philadelphia Wastewater Control Regulations
2. Issuance of wastewater discharge permits for Significant Industrial Users or SIUs (SIUs are defined in Section 4.4.2)
3. Implementation of monitoring of SIUs and enforcement of pretreatment requirements
4. Establishment of SIU reporting and compliance schedule submissions to PWD

The City of Philadelphia Wastewater Control Regulations are contained in Appendix A. These regulations apply to direct and indirect contributors to the City's wastewater system. Indirect contributors are those which transport and discharge septic tank waste at the PWD treatment plant.

To comply with the above regulations, PWD has developed and implemented an Industrial Pretreatment Program (IPP). The overall strategy for regulating connected industrial users revolves around various pretreatment limitations: prohibited pollutants, general local discharge limitations, categorical standards, industry-specific limitations, and compatible pollutants. The legal authority to implement and enforce the IPP is specified in the City's Wastewater Control Regulations. The Industrial Waste Unit (IWU) has the responsibility for implementing and enforcing these regulations.

As discussed in Section 3.2 of this report, the City currently has interjurisdictional agreements with ten outlying municipalities/authorities. The contracts with Philadelphia to treat and dispose of wastewater stipulate that the municipalities/authorities adopt PWD ordinances and regulations

with regard to the IPP. As these contracts came up for renewal, changes were made which allows PWD the authority to monitor and enforce these ordinances. PWD monitors, inspects, and when necessary, enforces penalties against industries in these outlying municipalities.

Currently, the IWU consists of a Manager, who is also the Pretreatment Coordinator, the Manager's assistant, two engineers, four permit administrators, and eight technicians. In addition, a pretreatment attorney handles legal responsibilities and is involved in fine assessments. Field work, which is the responsibility of the permit administrators and their staff of technicians, includes sampling, routine inspections, comprehensive process inspection, and spill responses.

4.4.1.1 Prohibited Pollutants

Prohibited pollutants are those that present a safety hazard. In addition to the general and specific prohibitions established by the City for discharges to the sewer system, it was necessary to incorporate certain federal pretreatment regulations into the ordinance. State requirements and limitations apply in any case where they are more stringent than federal regulations. The City reserves the right to impose even more stringent limitations than the federal and state guidelines. These regulations prohibit discharging into the sewer system the following substances:

1. Volatile organic compounds

2. Any grease, oil, or other substance that will become solid or viscous and obstruct flow to the treatment works or interfere with the treatment processes

3. Any wastewater with pH lower than 5.5 or greater than 12.0 or having other corrosive properties capable of causing structural damage or hazard to the sewers or treatment works

4. Any wastewater of such character or quantity that it causes interference with the treatment processes

5. Any wastewater containing noxious or malodorous materials which, either singly or by interaction with other wastes, are capable of creating a public nuisance

6. Any substance that may cause WPCP effluent or by-products, such as residues, sludge, or scum, to be unsuitable for reclamation or reuse, or any substance that will interfere with the reclamation process

7. Any substance that will cause the WPCP to violate its NPDES permit or water quality standards

8. Any wastewater with objectionable color not removed in the treatment process

9. Any wastewater having a temperature higher than 40°C (104°F)

10. Any pollutants, including oxygen demanding pollutants (BOD_5, etc.) and suspended solids, released at a flow rate and/or concentration that the user knows will cause interference or pass through to the treatment plant.

11. Any radioactive wastes, except in conformance with federal and state regulations

12. Any wastewater that causes a hazard to human life or creates a public nuisance

13. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through at the treatment plant

14. Any wastewater containing substances that solidify or become viscous between 32° and 150°F

15. Any trucked or hauled wastewater, except at discharge points designated by PWD

16. Pollutants that will result in the generation of toxic gases, vapors, or fumes within the sewer system or treatment plant in a quantity that may cause acute worker health and/or safety problems

17. Any wastewater with a flashpoint less than 140°F

18. Any wastewater where there is a significant likelihood of producing toxic effects to biota in the receiving body

Volatile organic compounds include gasoline, kerosene, naphtha, benzene, toluene, xylene, ethers, alcohols, ketones, and aldehydes. Prohibited explosive and flammable materials include peroxides, chlorates, perchlorates, bromides, carbides, hydrides, and sulfides. Table 4.4.1 is a list of those materials that the City specifically prohibits from being discharged to the sewer system without prior written permission from the City. Furthermore, the City reserves the right to modify this list should new state or federal regulations be enacted.

4.4.1.2 General Pretreatment Limitations

Limitations for certain pollutants, such as heavy metals, apply to all Industrial/Categorical Users. Categorical Users are those which discharge wastewater from a federally regulated process (see Section 4.4.1.3). While Table 4.4.1 lists substances that are prohibited from being discharged into the sewer system in any amounts, the following list of toxic substances may be discharged within the specified maximum levels:

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TABLE 4.4.1

MATERIALS PROHIBITED FROM DISCHARGE

Acrylonitrile	o-Chlorotoluene
Aldrin	o-Dichlorobenzene
Alpha BHC	p-Chlorotoluene
Aluminum	para-Dichlorobenzene
Barium	PCB-1248
Benzene	PCB-1260
Benzo (a) pyrene	Phenanthrene
Benzotrichloride	Phenols
Beryllium	Pyrene
Bis (2-ethylhexyl) phthalate (DEHP)	Styrene
Bromobenzene	Tetrachloroethylene (Perchloroethylene)
Bromodichloromethane	Tin
Bromoform	Titanium
Carbon tetrachloride	Toluene
Chlordane	Toxaphene (chlorinated camphene)
Chlorobenzene	Trichloroethylene
Chlorodibromomethane	Vinyl chloride
Chloroehtane	1,1,1,2-Tetrachloroethane
Chloroform	1,1,2,2-Tetrachloroethane
Cumene	1,1,2-Trichloroethane
DDT/DDE/DDD	1,1-Dichloroethane
Dibutylphthalate	1,1-Dichloroethlyene
Dichlorobromomethane	1,1 Dichloropropene
Dichloroethyl ether (Bis(2-chloroeth	1,2 trans, dichloroethylene
Dieldrin	1,2,3-Trichloropropane
diisobutylenes	1,2-cis, dichloroethylene
Dimethylnitrosamine	1,2-Dibromo-3-Chloropropane
Ethylbenzene	1,2-Dichloroethane
Heptachlor	1,2-Dichloropropane
Hexachlorobenzene	1,3 Dichloropropane
Hexachlorobutadiene	1,3-Dichloropropene
Iron	1,4-Dichlorobenzene (p)
Isopropylbenzene	2-Chlorophenol
Lindane	2,2-Dichloropropane
M-Dichlorobenzene	2,4-Dinitrophenol
Methyl chloride (Chloromethane)	2,4-Dinitrotoluene
Molybdenum	3,3-Dichlorobenzidiene
o,m,p-Xylenes	

	Daily Maximum (mg/l)	Monthly Average (mg/l)
arsenic	0.01	0.005
cadmium	0.2	0.1
copper	4.5	2.7
lead	0.69	0.43
mercury	0.01	0.005
nickel	4.1	2.6
silver	0.43	0.24
total chromium	7.0	4.0
zinc	4.2	2.6
selenium	0.2	0.1

In addition to the limits for the above toxic parameters, the City has also set maximum discharge limitations for the following pollutants:

free chlorine and/or free ammonia	5 mg/l
hydrogen sulfide	2 mg/l
cyanide	10 mg/l total cyanide 2 mg/l of cyanide readily released at 150°F and pH 4.5
fats, oil, and greases (petroleum or mineral)	100 mg/l

The City also reserves the right to establish more stringent limitations on wastewater discharges if necessary to meet the objectives stated above.

4.4.1.3 Categorical Standards

These standards are set by the EPA and are published in the *Federal Register* for selected categorical industries. Categorical users are those which discharge wastewater from a federally regulated process. Those industries that are subject to the federal standards are listed in Table 4.4.2. In addition to establishing numerical limits on discharges from these industries, EPA has also set reporting requirements for categorical users. The City of Philadelphia has identified approximately 85 categorical users within the drainage basin of PWD.

4.4.1.4 Industry-Specific Limitations

These limitations apply to SIUs identified in the IPP and are included in the connection permit for each SIU. They may be more stringent than the general discharge limitations cited in the Wastewater Control Regulations. The industry-specific limits may also be more stringent than the categorical standards established by EPA.

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TABLE 4.4.2

INDUSTRIAL CATEGORIES SUBJECT TO NATIONAL CATEGORICAL PRETREATMENT STANDARDS

Aluminum Forming	Meat Processing
Asbestos Manufacturing	Metal Finishing
Battery Manufacturing	Metal Molding and Casting
Builder's Paper	Nonferrous Metals Forming
Carbon Black	Nonferrous Metals Manufacturing
Cement Manufacturing	Paint Formulating
Coil Coating	Paving and Roofing (Tars and Asphalt)
Copper Forming	Pesticides
Dairy Products Processing	Petroleum Refining
Electrical and Electronic Components	Pharamaceuticals
Electroplating	Phosphate Manufacturing
Feedlots	Porcelain Enameling
Ferroalloy Manufacturing	Pulp and Paper
Fertilizer Manufacturing	Rubber Processing
Fruits and Vegetables Processing/Manufacturing	Seafood Processing
Glass Manufacturing	Soaps and Detergents Manufacturing
Grain Mills Manufacturing	Steam Electric
Ink Formulating	Sugar Processing
Inorganic Chemicals	Timber Products Manufacutring
Iron and Steel Manufacturing	Plastics Molding and Forming
Leather Tanning and Finishing	Textile Mills

4.4.1.5 Compatible Pollutants

Compatible pollutants such as BOD_5, suspended solids, nitrogen, and phosphorus can be treated by the WPCPs. However, industries that discharge very high quantities of these compatible pollutants are generally subject to surcharges to recover the treatment costs incurred from treating these high strength wastes.

4.4.2 Significant Industrial Users

Not all industrial contributors to the Philadelphia wastewater collection and treatment system are Significant Industrial Users (SIUs). An SIU is defined as one which (1) discharges to the City sewer system an average of 25,000 gallons or more per day of process wastewater, or contributes five percent or more of the average dry weather capacity of the WPCP; or (2) has in its wastes, toxic pollutants as defined pursuant to Section 307 of the Clean Water Act, or Pennsylvania Statutes and Rules; or (3) is found by the City, PADER, or EPA to have the potential for significant impact, either singly or in combination with other contributing users, on the wastewater treatment system, the quality of sludge, the treatment plant effluent quality, or through air emissions generated by or from the system; or (4) is categorically regulated by the Clean Water Act.

Potential SIUs are identified through database searches, directories, referrals, permit applications and interjurisdictional agreements. PWD's Engineering Support Group and the Manager of the IWU are responsible for screening all industrial and other non-domestic dischargers to determine if they should be classified as SIUs.

Other users have been classified as Significant because of high flow, high strength, or use of toxic substances not regulated elsewhere. The City has issued approximately 150 pretreatment permits to SIUs; however, it is expected that more will be issued due to the fact that the process flow discharge limit has recently been reduced to 25,000 gpd. Previously, the flow discharge limit was 50,000 gpd of total wastewater in excess of 350 ppm BOD_5 and/or 400 ppm suspended solids. A list of all categorical and other significant users is included in Appendix H.

In addition, PADER has issued NPDES permits to 33 industries within the City limits. The NPDES permits govern process discharges from these facilities; the City has not currently been delegated the responsibility for monitoring these users which are also listed in Appendix C.

4.4.3 Enforcement Response Plan

In addition to developing and implementing the IPP, the City of Philadelphia has the responsibility for enforcing all pretreatment requirements as specified in the Wastewater Control Regulations. The City's Enforcement Response Plan (ERP) establishes the guidelines for ensuring that this responsibility is met in a consistent, systematic, and timely manner. The goals as stated in the ERP are:

- To identify all instances of non-compliance with the pretreatment requirements

- To ensure that the industrial user returns to compliance as quickly as possible and to ensure its continuing compliance thereafter
- To penalize industrial users for their violations of the pretreatment requirements
- To deter future violations of the pretreatment requirements; and
- To recover any expenses incurred by the PWD attributable to an industrial user's non-compliance.

4.4.3.1 Non-Compliance Identification

As specified in the ERP, the Permit Administrator and the Manager of the IWU within PWD are charged with the responsibility of determining non-compliance. Any user subject to pretreatment standards must periodically submit to PWD a report indicating the nature and concentration of all pollutants in the wastewater discharge from regulated processes and the average and maximum daily flow from the process units limited by pretreatment standards and requirements. The user must provide monitoring facilities to allow inspection, sampling, and flow measurements of the building sewer and/or internal drainage systems. The Permit Administrator must review all SIU reports and take samples at least once each reporting period. Although the Permit Administrator must inspect all SIUs at least once every calendar year, he/she may conduct as many inspections as necessary to ensure the SIU is conforming to all requirements of the IPP and to confirm measures taken to ensure compliance, including inspections of storage, pretreatment, and process facilities. Non-categorical or inactive industries are inspected every three to five years. Non-categorical industries are those which are not subject to federal standards as published in the *Federal Register*. Inactive industries are those which have suspended operation of regulated processes. The Permit Administrator monitors compliance schedules, when issued, and maintains supporting documentation regarding SIUs.

4.4.3.2 Enforcement Response

The ERP provides for typical responses to specific violations of the pretreatment requirements. A violation is an exceedance of effluent limits of a given parameter. A significant violation occurs when the concentration of a pollutant is twice the permitted limit for that pollutant. The ERP also describes the criteria for defining Significant Non-Compliance (SNC). SNC is defined as either two significant violations within a 45-day period or when over five percent of data per parameter collected within a 6-month period is in violation. When limits are set on the basis of a production-based standard, a significant violation is defined as a 20 percent exceedance of the production standard. The following types of violations are subject to the ERP:

- Effluent limit violations
- WPCP verification sampling violations
- Self-monitoring (sampling) violations
- Reporting violations
- Compliance schedule violations

- Unauthorized discharge (no permit)
- Other permit violations

Violations of pretreatment requirements that constitute SNC are subject to strong and immediate enforcement response as stipulated in the ERP. Specific time frames have been established requiring response by the SIU to each type of violation including those constituting SNC. The first step in enforcement response is notification of violation. After notification, the response may take the form of implementation of a compliance schedule, formal civil litigation, fines and damage costs, revocation of permit, termination of service and referral for criminal prosecution, depending on the severity of the violation and the cooperation of the permittee.

Some violations result in mandatory fines of the industrial users, while fines for other violations are discretionary. The Home Rule Charter for the City limits fines to $300 per day per violation; however, House Bill No. 795 of the General Assembly of Pennsylvania, passed in 1992, provides for enhanced penalty authority for Publicly Owned Treatment Works (POTWs) which can assess fines up to $25,000 per day per violation and follows a Civil Penalty Assessment Policy Document.

Compliance schedules establish milestone dates for completion of specific tasks leading to full compliance. Compliance schedules are most often instituted in cases of effluent limit violations, although they may be necessary in other instances of non-compliance. The Enforcement Response Plan for the City of Philadelphia is contained in Appendix L.

4.4.4 Sludge

In response to more stringent sludge quality requirements for land disposal of processed sludge as discussed in Section 4.3, PWD has made concentrated efforts to improve sludge quality. These efforts include the IPP, which has contributed to success in heavy metal reduction. Organics have dropped significantly with the IPP mandated by federal regulations.

Substantial revisions to the City's Wastewater Control Regulations will be submitted to EPA for approval in 1993. Also being considered are more stringent regulations to address the problem of discharges of volatile organic substances because they cause headworks odor problems and interfere with normal plant maintenance.

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5.0 PROJECTION OF FUTURE CONDITIONS

5.1 GENERAL

5.1.1 Background

The objectives of this chapter are (1) to identify the 5-year wastewater needs of the Philadelphia wastewater system and (2) to determine the long-term trends that may be expected within the greater Philadelphia service area. Projections of future wastewater flows and loadings within the service areas of each of the City's three Water Pollution Control Plants are essential in determining both the short (5 year) and long (10- to 20-year) term needs. Consistent with previous planning for the City of Philadelphia, these projections of future wastewater flows and loadings rely upon the anticipated future population of each service area as the primary gauge of future needs. The following provides a detailed description of the methodology used to develop the forecasted wastewater flows and loadings for both the City of Philadelphia and, to an extent, the ten outlying municipalities/authorities that contribute flow to the Philadelphia wastewater system.

Previous planning documents generated for facilities within Philadelphia have relied exclusively on population counts to evaluate and project wastewater flow and loadings. Comprehensive population projections were provided in the Facility Reports for each of the City's three Water Pollution Control Plants (WPCPs) in the early 1970s (summary of reports provided in Section 2.5.1) and were used to develop the design criteria for the upgrade of the WPCPs from primary to secondary treatment. Per capita wastewater flows and loadings were calculated and used along with the projected populations for each service area to arrive at projected flows, loadings, and design criteria for the WPCPs.

Following the implementation of the upgrades in the 1970s to the WPCPs, the 1980 census reflected a large percentage decrease in population that did not support the population projected in the WPCP Design Reports. The population projections were, therefore, revised to reflect this more significant decline by letter to Mr. John Kennedy, PADER, from Mr. Thomas Walton, PWD dated April 4, 1983 (see Section 2.5.1.4 for summary). The revised population projections presented in Mr. Walton's letter basically halved the percent decrease experienced in Philadelphia during the 1970s for the 1980s and then halved again for every decade afterward. Furthermore, the facilities that remained to be upgraded to secondary treatment at the Northeast and Southwest WPCPs were down-sized to reflect the lower expected wastewater flows and loadings. The 201 Facility Plan for Sludge Management, June 1984 (see Section 2.5.1.6 for summary) that was used to develop design criteria for the Sludge Processing and Distribution Center also reflects these revised population projections.

The population projections provided in the WPCP Facility Plans and 201 Sludge Management Plan described above were based on the population density and resultant population of each of the WPCP service areas to derive flows and loadings. Population densities were derived for regions

within the service area, as well as per capita flows and loadings. The densities were then projected to some future level with total populations and wastewater quantities being derived from the projected population density using the per capita flow and loading production level. It is important to note that the wastewater flows and loadings were not determined from separate categorical users within the system. The per capita flows and loadings developed in these documents included allowance for flows from domestic, industrial, commercial, institutional, inflow, and infiltration sources.

5.1.2 Methodology

Wastewater production, characteristics, and trending over time will differ in proportion to the various wastewater sources within the system. More accurate and meaningful results can usually be achieved if the total wastewater flows are broken down into the categorical sources and separate projections performed on each to forecast the total future flows, an approach required by PADER's current sewage facilities planning regulations. This report attempts to provide a logical method for this breakdown of total wastewater flows into component sources and to project future flows based upon the component parts. From the projected wastewater flow and loadings, the 5-year needs will be identified and long-term trends forecasted in Chapter 6.

The primary sources of information used in these population and wastewater flows projections include:

- Facility Reports for each of the Water Pollution Control Plants (circa early 1970s)
- 1990 U.S. Census Data
- Population projections for 1996 provided by the National Planning Data Corporation
- Draft population projections from the DVRPC as well as the planning commissions for Bucks, Delaware, and Montgomery counties.
- Sewer System Evaluation Surveys for each of the WPCP service areas (circa early 1980s)
- Monthly flow records for a 3-year period from the three WPCPs for 1989 to 1991

Since the information compiled in these projections is from several different sources and periods in time, there will be some inherent discrepancies in the cross referencing of data. However, the following methodology to minimize these discrepancies has resulted in a comprehensive projection of future population, wastewater flows, and loadings.

5.1.3 Categorical Use within Philadelphia

As mentioned above, the accuracy and meaningfulness of wastewater projections are increased when the wastewater flows are categorized, separate projections are made for each category, and the separate projections combined to arrive at a total projected flow. Typical categories used in wastewater projections include:

- Domestic - (or residential) wastewater flow is from domiciles. All wastewater generated from normal living habits and activities of an apartment dweller or homeowner are included in the domestic classification.

- Commercial - wastewater flow from laundries, restaurants, office facilities, and other commercial establishments associated with residential communities and business centers.

- Industrial - wastewater that emanates from industrial and manufacturing facilities. This wastewater includes sanitary, cafeteria, and cleanup wastes as well as process wastewater from these facilities.

- Institutional - wastewater generated from sources not included in the other classifications, including that from schools, colleges, universities (both resident and non-resident), nursing homes, hospitals, prisons, etc. Institutional wastewater is primarily sanitary wastes.

- Infiltration - flows primarily originate from groundwater seeping into the collection system, and it has been evaluated and quantified within this report as described above.

The most effective method to break the origin of wastewater into the categorical users described above is to reference and compile water supply accounts that are categorized by user type and thereafter to make a determination of the percentage of potable water that is returned to the collection system. This direct method of determining categorical users is only effective if the water utility has its accounts arranged to identify the user type, which unfortunately the PWD does not.. However, as a part of their methodology in identifying infiltration flows, the SSES reports (see Section 2.5.2 and Section 5.1.2) did categorize the sources of wastewater into Domestic and Industrial users. In the case of these SSES reports, the industrial classification included the commercial, industrial, and institutional categories described above. Therefore, the SSES reports represent the most recent and comprehensive breakdown available of wastewater flows from their component sources. This report utilizes the breakdown of flows contained in the SSESs to describe existing flows and similarly combines the industrial, commercial, and institutional flows into one category hereafter referred to as ICI (Industrial, Commercial, and Institutional) for purposes of future projections. Section 5.3 of this Plan provides a tabulation of the component flows to each of the WPCPs and derives domestic per capita wastewater production by dividing the domestic flow category by the population within the City served by each WPCP as defined by the 1990 Census Data.

The Northeast WPCP and Southwest WPCP SSES reports provide a breakdown of the actual wastewater flows based on the domestic and ICI categories that can be directly applied to this analysis, while the SSES report for the Southeast WPCP provides a breakdown of the wastewater sources by land use categories. In the latter case, the breakdown of the wastewater flows by land use (by acreage and percentages) is not particularly helpful to this analysis since a direct correlation between land use and wastewater production cannot be made. An additional consideration in developing the information presented is that the wastewater flows and categorical breakdown found in the SSESs is based on the base flows measured during the development of the SSESs in the late 1970s to mid 1980s. As this is the only data available, it was necessary to assume that the proportions of the domestic and ICI flows within each service area did not change over this period in time. The percentage of the wastewater flow from each source within the City (excluding infiltration) was then extrapolated to the current base flows to arrive at a categorical flow rate for each source of flow, domestic and ICI. With this completed, domestic per capita flow rates were calculated for the Northeast and Southwest WPCP service areas. In order to derive the domestic and ICI wastewater usage for the Southeast WPCP service area, the domestic per capita flow rates for the surrounding service areas (Northeast and Southwest) were averaged and applied to the Southeast service area's 1990 population to arrive at a domestic flow rate for this service area. The ICI flow rate was then derived by subtracting the domestic from the total averaged base flow (minus infiltration) generated within the service area for the period covering 1989 to 1991.

It is upon this framework that future growth and development trends have been assessed, based not only on the primary sources of information identified above but also upon many other sources including, but not limited to, the City of Philadelphia Planning Commission, Delaware Valley Regional Planning Commission (DVRPC), and Philadelphia Industrial Development Corporation (PIDC). It is noted that the Land Use Planning Reports prepared by the Philadelphia Planning Commission (see Section 2.5.3 for summary) have been reviewed for their relevance to population and growth projections. These studies primarily showed the growth potential for select areas within the City, but they did not include mention of specific projects nor projected growth; therefore, other than for purposes of a subjective evaluation, data was not available for use in development of projected populations and wastewater flows.

The scope of this Act 537 Plan specifically called for a focus on the Philadelphia County needs and projects. To the extent that information was available from the outlying county planning commissions, growth trends and/or population projections were obtained and considered primarily in the 5 year needs. However, the thrust of the information from outside the City of Philadelphia was taken in the context of the current agreements for allocated capacity.

5.2 FUTURE GROWTH AND DEVELOPMENT TRENDS

Based upon U.S. Census Information, in 1950 Philadelphia reached a peak total population of 2,071,605 persons. Since then, according to the 1990 U.S. Census figure of 1,585,577, the City's population has declined by 23.5 percent, a loss of 486,028 persons. The decade with the largest percentage decline was from 1970 to 1980 with a drop of 13.4 percent. The 1990 Census indicates a leveling-off of the rate of decline with a drop of 6.1 percent since 1980.

The decline in population in Philadelphia is common to many large cities in the United States, reflecting a societal and demographic trend away from the large cities and concentrated population centers. This trend is expected to continue at a stabilized rate over the next several decades. However, successful redevelopment and revitalization programs have and will continue to be developed within the City, which will offset, to some extent these residential trends.

5.2.1 City of Philadelphia

To forecast population changes within the City of Philadelphia, this Plan utilizes population projections from the National Planning Data Corporation. No other source of population projections for the City has been identified at the time of preparation of this report. The National Planning Data Corporation has projected population change within the City from 1990 to 1996. In order to forecast population changes within the City to the year 2015, BCM has assumed that the rate of change projected for each of the twelve planning analysis sections from 1990 to 1996, which reflects the leveled-off population decline rate, will remain constant to the year 2010.

The results of the analysis are shown in Table 5.2.1 and Figure 5.2-1. Based upon the stated methodology, the City of Philadelphia population served by the Northeast Water Pollution Control Plant is forecast to be 750,800 persons in 1996; 744,300 persons in the year 2000; 728,300 persons in the year 2010; and 720,600 in the year 2015. The City population served by the Southeast Water Population Control Plant is forecast to be 333,800 persons in 1996; 325,200 persons in the year 2000; 305,000 persons in the year 2010; and 296,300 persons in the year 2015. The City population served by the Southwest Water Pollution Control Plant is forecast to be 466,700 persons in 1996; 485,800 persons in the year 2000; 439,500 persons in the year 2010; and 430,400 persons in the year 2015.

It is our opinion, based upon discussions with City and regional planning and development officials, that these forecasts may not necessarily be the most accurate barometer of future development activity in the City. This is particularly the case for the area served by the Southeast Water Pollution Control Plant. It is anticipated that Center City will continue to show positive development trends as the Convention Center project proceeds to completion. Therefore, the Center City area deserves further evaluation.

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TABLE 5.2.1

PHILADELPHIA COUNTY POPULATION FORECASTS BY PLANNING SECTION

NEWPCP Planning Section	1990	1996	Percent Change 90-96	Percent Change Per Year	2000	Projections 2010	2015
E	279	269	-4.00%	-0.67%	262	244	236
F	64,878	63,306	-2.48%	-0.41%	62,258	59,681	58,446
G	62,973	61,854	-1.81%	-0.30%	61,108	59,265	58,371
I	60,728	58,899	-3.11%	-0.52%	57,680	54,695	53,279
J	173,794	172,095	-0.99%	-0.16%	170,963	168,150	166,767
K	237,251	234,170	-1.32%	-0.22%	232,116	227,026	224,537
L	160,547	160,158	-0.24%	-0.04%	159,899	159,251	158,929
Total	**760,451**	**750,751**			**744,285**	**728,312**	**720,566**

SEWPCP Planning Section	1990	1996	Percent Change 90-96	Percent Change Per Year	2000	Projections 2010	2015
A	38,913	40,856	4.76%	0.79%	42,152	45,494	47,298
B	92,312	88,581	-4.21%	-0.70%	86,094	80,051	77,241
E	122,516	112,924	-8.49%	-1.42%	106,530	91,449	84,976
F	27,457	27,639	0.66%	0.11%	27,760	28,065	28,218
G	31,742	30,798	-3.06%	-0.51%	30,169	28,628	27,897
I	30,957	30,317	-2.11%	-0.35%	29,890	28,838	28,331
J	2,756	2,663	-3.50%	-0.58%	2,600	2,449	2,377
Total	**346,651**	**333,777**			**325,195**	**304,974**	**296,339**

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TABLE 5.2.1 (Continued)

SWWPCP Planning Section	1990	1996	Percent Change 90-96	Percent Change Per Year	2000	Projections 2010	2015
A	6,733	6,478	-3.94%	-0.66%	6,308	5,895	5,7018
B	78,632	75,547	-4.08%	-0.68%	73,490	68,488	66,157
C	81,885	80,440	-1.80%	-0.30%	79,477	77,097	75,943
D	219,713	215,529	-1.94%	-0.32%	212,740	205,857	202,526
E	23,696	22,528	-5.18%	-0.86%	21,750	19,871	19,013
F	13,710	12,909	-6.20%	-1.03%	12,376	11,096	10,522
H	42,525	41,547	-2.35%	-0.39%	40,895	39,291	38,520
I	11,581	11,681	0.86%	0.14%	11,748	11,915	12,000
Total	**478,475**	**466,660**			**458,783**	**439,509**	**430,383**

Based on projections obtained from National Planning Data Corp. (1991).

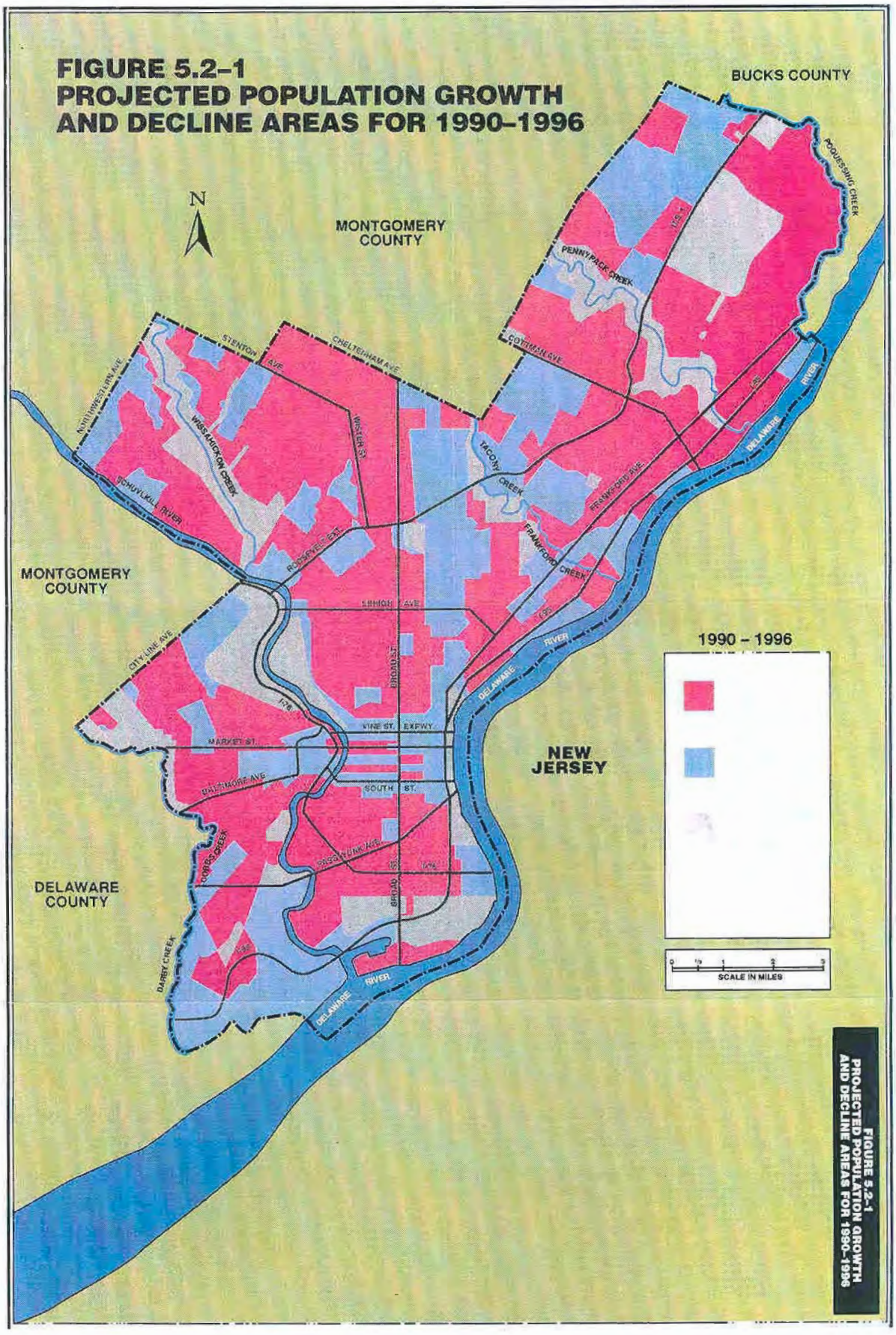
FIGURE 5.2-1
PROJECTED POPULATION GROWTH
AND DECLINE AREAS FOR 1990–1996
BUCKS COUNTY
MONTGOMERY COUNTY
MONTGOMERY COUNTY
DELAWARE COUNTY
NEW JERSEY
N
PENNYPACK CREEK
POQUESSING CREEK
STENTON AVE.
CHELTENHAM AVE.
NORTHWESTERN AVE.
WISSAHICKON CREEK
SCHUYLKILL RIVER
WISSAHICKON
TACONY CREEK
FRANKFORD AVE.
FRANKFORD CREEK
DELAWARE RIVER
ROOSEVELT EXT.
LEHIGH AVE.
CITY LINE AVE.
BROAD ST.
VINE ST. EXPWY.
MARKET ST.
BALTIMORE AVE.
SOUTH ST.
PASSYUNK AVE.
CROSBY CREEK
DARBY CREEK
1990 – 1996
SCALE IN MILES
FIGURE 5.2-1
PROJECTED POPULATION GROWTH
AND DECLINE AREAS FOR 1990–1996

The City of Philadelphia Planning Commission has inventoried 55 potential development projects in Center City, these are listed in Appendix M, Center City Project Inventory - 1992. Selected highlights of that inventory include:

Northwest Quadrangle

- Forest City Dillon - 19th and Hamilton, 350 units of elderly housing
- Museum Towers II - 18th and 19th Streets, 400 units of residential housing and a supermarket
- Franklintown Boulevard - 400 units of residential housing, 2,000,000 square feet, mixed use

Southwest Quadrangle

- Orchestra Hall - Broad and Spruce Streets - 3,000 - 4,000 seats and mixed use development
- Meridian Tower - 800,000 square feet of office space

East of Broad Street

- Spectrum II Sports and Entertainment Complex - 21,000 seats
- Federal Detention Center - 750 beds
- City Justice Center
- Convention Center - 400,000 plus square feet
- Gallery II - 1,000,000 square feet of office space
- Gimbels Site - 8th and 9th Streets/Market Street - 2,000,000 square feet of office space
- Delaware River Waterfront - Piers 3, 5, 9, 11, 24, 25, and residential housing and commercial use

In addition to University City and Center City, commercial, residential, and industrial development is expected to occur in the Northeast and Southwest; however, based upon discussion with City development officials, rates of growth will be slower than that of Center City.

According to City development officials, prior to the recent recession, commercial space in Center City was being absorbed at a rate of about 1,000,000 square feet per year. With the predicted economic recovery, absorption rates could once again approach those levels.

As noted in Section 5.1, not all categorical sources of flows at the WPCPs are proportional to the population. For instance, infiltration is not significantly proportional nor are the ICI flows directly contingent on population levels. The purpose of breaking down the flows of the WPCPs is to provide a more realistic analysis of how these flows will vary with the decreasing population. There is, however, some correlation of ICI flows to population levels; people shop in the commercial establishments, work in the industries and manufacturing plants, and attend the institutional facilities. With a decreasing population, we may conclude that the ICI may decrease in a proportional amount. However, as noted above, this may not provide an accurate projection of the potential ICI growth within the City. To compensate for both the potential decrease and the possible growth from projects discussed above, we project the proportion of ICI flow to remain constant.

5.2.2 Contributing Municipalities

To forecast population changes within the contributing municipalities, BCM obtained draft population projections from the Delaware Valley Regional Planning Commission as well as the planning commissions for Bucks, Delaware, and Montgomery Counties. These projections are not considered official, but are the best information available at the time of preparation of this report. The draft projections have been forwarded to the suburban counties for review and comment, but will not become official until subsequent to that review. We will, however, utilize these projections for planning purposes. Table 5.2.2 tabulates the population projections to the year 2020.

5.2.2.1 Montgomery County

Montgomery County contributing municipalities are projected to lose population as a whole by roughly 1.1 percent from 1990 to the year 2000; 1.6 percent from the year 2000 to 2010; and 1.9 percent from the year 2010 to the year 2020.

These townships are established communities that anticipate little or no growth over the 5-year planning period. As shown in Table 3.2.1, Abington, Cheltenham, Lower Merion, and Lower Moreland have contributed wastewater flows well below those stipulated in their agreements for the past two years.

Abington Township is currently preparing an Official Act 537 Plan Revision to determine future wastewater treatment needs, in particular, alternatives for handling flows from the currently overloaded Abington Township WWTP and several existing private treatment facilities. Should Abington decide to proceed with diversion of flows in those areas, there may be an increase in flow to the PWD system, i.e., the NEWPCP; however, it is not anticipated that this additional flow will be in excess of the current capacity agreement since this agreement originally considered saturation (build-out) densities.

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TABLE 5.2.2

CONTRIBUTING MUNICIPALITIES POPULATION FORECASTS 1990 TO 2020

	1990 US Census	2000	2010	2020
Montgomery County				
Abington	56,322	56,341	55,627	53,710
Cheltenham	34,923	34,023	33,511	32,919
Lower Merion	58,003	57,432	56,349	55,663
Lower Moreland	11,768	12,029	11,789	11,805
Springfield	19,612	18,737	18,303	18,065
Subtotal	**180,628**	**178,562**	**175,579**	**172,162**
Bucks County				
Bensalem Township	56,788	60,625	61,975	60,166
Bristol Township	57,129	55,114	54,400	54,465
Falls Township	34,997	34,386	34,467	33,909
Hulmeville Borough	916	919	917	950
Langhorne Borough	1,361	1,118	1,076	1,059
Langhorne Manor Borough	807	827	826	831
Lower Makefield Township	25,083	28,774	34,815	31,834
Lower Southampton Township	19,860	20,771	21,050	21,951
Middletown Township	43,063	46,315	50,516	53,754
Newtown Borough	2,565	2,442	2,371	2,251
Newtown Township	13,685	18,739	23,240	23,780
Northampton Township	35,406	47,390	49,967	51,062
Penndel Borough	2,703	2,756	2,668	2,533
Subtotal	**294,363**	**320,176**	**338,288**	**338,545**

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TABLE 5.2.2 (Continued)

	1990 US Census	2000	2010	2020
Delaware County				
Darby Township	10,955	10,258	9,626	8,987
Eddystone Borough	2,446	2,349	2,152	1,961
Folcroft Borough	7,506	7,536	7,392	7,214
Glenolden Borough	7,260	7,173	7,103	6,998
Marple Township	23,123	24,078	25,129	26,091
Morton Borough	2,851	3,058	3,288	3,373
Nether Providence Township	13,229	14,185	14,213	14,090
Norwood Borough	6,162	5,872	5,608	5,328
Prospect Park Borough	6,764	6,696	6,644	6,558
Ridley Park Borough	7,592	7,575	7,574	7,535
Ridley Township	31,169	29,282	28,398	27,712
Rutledge Borough	843	807	775	740
Springfield Township	24,160	22,953	21,856	21,585
Swarthmore Borough	6,157	6,169	6,196	6,190
Upper Darby Township	81,177	80,025	78,119	74,751
Subtotal	**231,579**	**228,026**	**224,073**	**219,068**
Total for Contributing Municipalities	**706,570**	**726,764**	**739,940**	**729,775**

Source: Delaware Valley Regional Planning Commission Draft (unofficial) Projections.

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For the past two years, flows from the Erdenheim section of Springfield Township have exceeded those stipulated in the agreement with PWD, and flows from the Wyndmoor area are approaching the agreement limits. This problem will have to be addressed in the near future; however, considering the low flows from these municipalities and the limited amount of potential development, the increased flows will have little impact on the SEWPCP or the SWWPCP by new renegotiated agreements. Moreover, forecasted decreases in population over the 20-year planning period will have a dampening effect on the need to substantially revise the amount of contracted flows and loadings to the Philadelphia WPCPs.

5.2.2.2 Bucks County

Bucks County contributing municipalities are projected to increase population by roughly 8.1 percent from 1990 to the year 2000; 5.7 percent from the year 2000 to the year 2010; and .08 percent from the year 2010 to the year 2020.

As detailed in Section 3.2 of this report, PWD has agreements to treat wastewater from Bensalem Township, Lower Southampton Township, and the Bucks County Water and Sewer Authority (BCWSA). The Bucks County Planning Commission (BCPC) completed a wastewater facilities plan in 1990 that documents the future needs for municipalities within the County. As noted in Section 4.2.1 herein, the flows from BCWSA are conveyed to the Upper Delaware Interceptor via the recently upgraded Neshaminy Interceptor. As stated in the BCWSA Report, the 1990 average wastewater flow from the municipalities contributing to the Neshaminy Interceptor was 16.37 mgd. As shown in Table 3.2.3, the allocated capacity at the NEWPCP for BCWSA is 20 mgd. The BCPC data indicate that the allocated capacity may be exceeded by 1.026 mgd by the year 2000, representing an average need of 21.026 mgd. These flow projections do not include additional flows from existing residential and industrial developments in Northampton Township currently utilizing on-lot disposal systems; according to the BCWSA Report, it is anticipated that these wastewater flows will be treated at the proposed Warwick Township Wastewater Treatment Facility. However, if construction of that facility is delayed or canceled, it is possible that those flows would contribute to the Neshaminy Interceptor, resulting in a further exceedance of the current capacity allocation. Based on the potential flows by the year 2000, it is expected that the agreement with BCWSA and PWD will have to be revised to provide additional capacity. Conversely, Bristol and Lower Makefield Township propose to direct existing and projected wastewater flows from the Neshaminy Interceptor. Should this diversion occur, the BCWSA allocation would still be exceeded by 0.052 mgd by the year 2000 to an average flow of 20.052 mgd. The current allocations would be sufficient if this diversion of flows was coupled with the reduction of I/I and reduced development pressure in the service area. Consideration of these potential measures and those included in the 1990 Report are key to the scope of this report.

The Townships of Bensalem, Lower Southampton, and Upper Southampton contribute wastewater flow to the Poquessing Interceptor, which also discharges to the NEWPCP. The Bucks County Wastewater Facilities Plan states that the 1990 average flow to the NEWPCP from those municipalities was 5.524 mgd, and the projected flow for 2000 is 6.632 mgd, which is well within the combined allocated capacity of these municipalities of 13.27 mgd.

5.2.2.3 Delaware County

Delaware County contributing municipalities are projected to lose population as a whole by roughly 1.4 percent from 1990 to the year 2000; 1.7 percent from the year 2000 to the year 2010; and 2.2 percent from the year 2010 to the year 2020.

As presented in Section 3.2 of this report, PWD has agreements with Upper Darby Borough and the Delaware County Regional Authority (DELCORA). The Central Delaware County Authority (CDCA), the Muckinapates Authority, and the Darby Creek Authority (DCA) are those authorities included in DELCORA that contribute to the PWD system. These service areas are conveyed to the Philadelphia SWWPCP via the Central Delaware Pump Station, Muckinapates Pump Station, and the Darby Creek Pump Station, respectively. All regional planning for this area is primarily conducted by the Delaware County Planning Commission (DCPC) with assistance from DELCORA.

The DCPC is currently conducting an Act 537 Plan for the County. The Countywide Plan has been split into a Western Service Area and an Eastern Service Area, the latter concerning the planning area tributary to Philadelphia. Information from the Planning Commission indicates that the focus of the Eastern Plan is primarily sewer system evaluations, with most construction being redevelopment and in-fill. Furthermore, DELCORA is presently considering the diversion of flows from the Central Delaware County Authority drainage area, which is currently tributary to Philadelphia SWWPCP, to the Chester WWTP in order to optimize operating costs and utilize more of that treatment plant's reserve capacity. This diversion would represent an average flow of approximately 11 mgd, thereby lowering DELCORA's usage of allocated flows from approximately 80 percent to approximately 60 percent. The CDCA and DCA are also currently engaged in storm water management programs and are metering flows to determine the capacity of their sewer systems.

With a negative growth factor, it appears that the current allocations for both DELCORA and Upper Darby are sufficient to meet the future needs of the area. Based on the wastewater flows to PWD from 1990 and 1991, as shown in Table 3.2.3, DELCORA has available capacity of 8.4 to 9.6 mgd, and Upper Darby has available capacity of 2.5 to 5.1 mgd for future flows.

Based upon these projections, Bucks County contributing municipalities will grow, producing increased flows to the Northeast Water Pollution Control Plant. However, the population in contributing municipalities in Delaware County and Montgomery County will decrease slowly and have no appreciable impacts on flows to their respective water pollution plants.

5.3 FORECAST OF FUTURE FLOWS AND WASTELOADS

5.3.1 Base Flows

The first step in the methodology to project future flows is to develop a base flow for each WPCP and outlying municipality/authority upon which future flows will be projected. It is important to

recognize that the WPCP capacity must be evaluated first and foremost on a dry weather basis. Any wet weather or storm flow evaluation is only meanful in the context of relative capacity with the collector system and combined sewer overflows. Since approximately 60 percent of the Philadelphia collection system is combined, the WPCPs are subject to storm water flow during many rainfall events. By design, the collection system currently limits the storm water diverted to the WPCPs. Each of the WPCPs is permitted based upon average monthly flows. This is the primary planning parameter used for evaluation of capacity and projection of future flows. The year 1990 was chosen as a base year to evaluate the flows at the plants since accurate census data, recorded flows, and past projections from the Facility Reports of the WPCPs are all available for this year. Monthly average flows for a 3-year period centered around 1990 (1989 - 1991) were used to develop the current base flows from the City and outlying municipalities/authorities. The monthly average daily flows measured at the WPCPs and metered from the outlying municipalities and total rainfall in inches from January 1989 to 1991 is tabulated in Table 5.3.1. The fact that the flows recorded at each of the WPCPs have actually increased over the last decade while the population served by the same plants has decreased can be attributed, at least in part, to the recent efforts of the PWD to increase the delivery of wet weather flow to the WPCPs. Figures 5.3-1, 5.3-2, and 5.3-3 graphically show for the NE, SE, and SW plants respectively, the monthly average flows, maximum monthly average, minimum monthly average for 1981 to 1991. Therefore, in developing a base flow to each WPCP, the effect of rainfall on the flows to the plant must be minimized with regards to the current use of plant capacity. This is especially important in evaluating the reserve capacity of each of the WPCPs since actual wastewater use must be considered without the effects of storm water from the combined collection system. Otherwise, plans made to increase the capacity of the WPCPs, would not differentiate between dry-weather and wet-weather conditions and would effectively be a combined sewer overflow remediation measure more so than a wastewater treatment improvement.

As discussed in Section 6.4.1, the control of combined sewer overflows has been determined to be a significant goal of PADER and one potential solution may be to increase the primary treatment capacity of the WPCPs to handle more wet weather flows. However, the most effective and economical CSO solution has yet to be determined. Therefore, the projection of future wastewater flows at each of the WPCPs is restricted to increased wastewater streams and not the potential of higher rain induced peak flows at the WPCPs caused by the combined sewer system.

Base flows to each WPCP were derived by averaging the monthly average daily flows of the driest month (month with the lowest total rainfall) of each of the three years in question (1989 - 1991). The base flows from the outlying municipalities/authorities were derived in a similar manner by averaging the flow from the outlying municipalities for the same dry months as those evaluated for the plant flows. These baseflows are presented in Table 5.3.2.

Figures 5.3-4 through 5.3-6 graphically show for the WPCPs, respectively, the average monthly flows, average annual flows, maximum monthly flows, and base flows for the period used to determine the current WPCP base flows (1989 to 1991).

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TABLE 5.3.1

AVERAGE MONTHLY FLOWS AT THE WATER POLLUTION CONTROL PLANTS AND MONTHLY RAINFALL AMOUNTS 1989 - 1991

Month	NEWPCP (mgd)	SEWPCP (mgd)	SWWPCP (mgd)	Rainfall (inches)	Comment
1989					
January	176.52	106.17	175.39	2.41	
February	189.62	105.30	175.98	3.25	
March	192.87	105.98	183.64	4.41	
April	192.52	101.98	191.06	2.27	
May	213.52	106.65	207.50	6.76	
June	219.69	112.72	198.32	4.73	
July	218.53	111.64	206.88	9.44	
August	193.80	110.99	181.54	3.92	
September	197.32	112.63	182.10	5.03	
October	197.15	108.43	187.32	3.44	
November	187.28	104.26	180.25	1.79	
December	176.63	104.08	176.14	1.21	Low
Annual Average	**196.29**	**107.57**	**187.18**	**48.66**	**Total**
1990					
January	193.97	102.36	197.37	4.09	
February	194.35	89.70	184.66	1.48	
March	183.56	57.56	171.92	2.59	
April	210.52	96.90	187.24	3.16	
May	201.94	102.92	193.44	6.08	
June	199.00	106.67	196.17	3.39	
July	189.52	109.15	186.74	2.62	
August	200.65	109.28	195.06	4.07	
September	183.13	104.95	178.09	1.71	
October	178.80	98.85	169.47	1.68	
November	179.11	102.68	160.36	1.17	Low
December	195.34	99.51	175.65	3.81	
Annual Average	**192.45**	**101.71**	**181.71**	**35.85**	**Total**

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TABLE 5.3.1 (Continued)

Month	NEWPCP (mgd)	SEWPCP (mgd)	SWWPCP (mgd)	Rainfall (inches)	Comment
1991					
January	203.39	103.78	190.87	4.17	
February	182.36	103.65	171.96	0.75	Low
March	200.81	107.67	186.51	4.06	
April	195.96	107.36	189.34	2.81	
May	191.72	109.09	183.03	1.82	
June	182.36	118.58	184.04	2.94	
July	194.73	113.93	213.88	4.79	
August	198.77	124.87	209.17	3.86	
September	200.81	115.71	206.83	3.56	
October	197.99	104.72	193.75	1.61	
November	187.34	103.07	193.17	1.96	
December	205.17	108.97	206.25	3.86	
Annual Average	**195.12**	**110.12**	**194.07**	**36.19**	**Total**

FIGURE 5.3-1
Northeast Water Pollution Control Plant - Monthly Flow

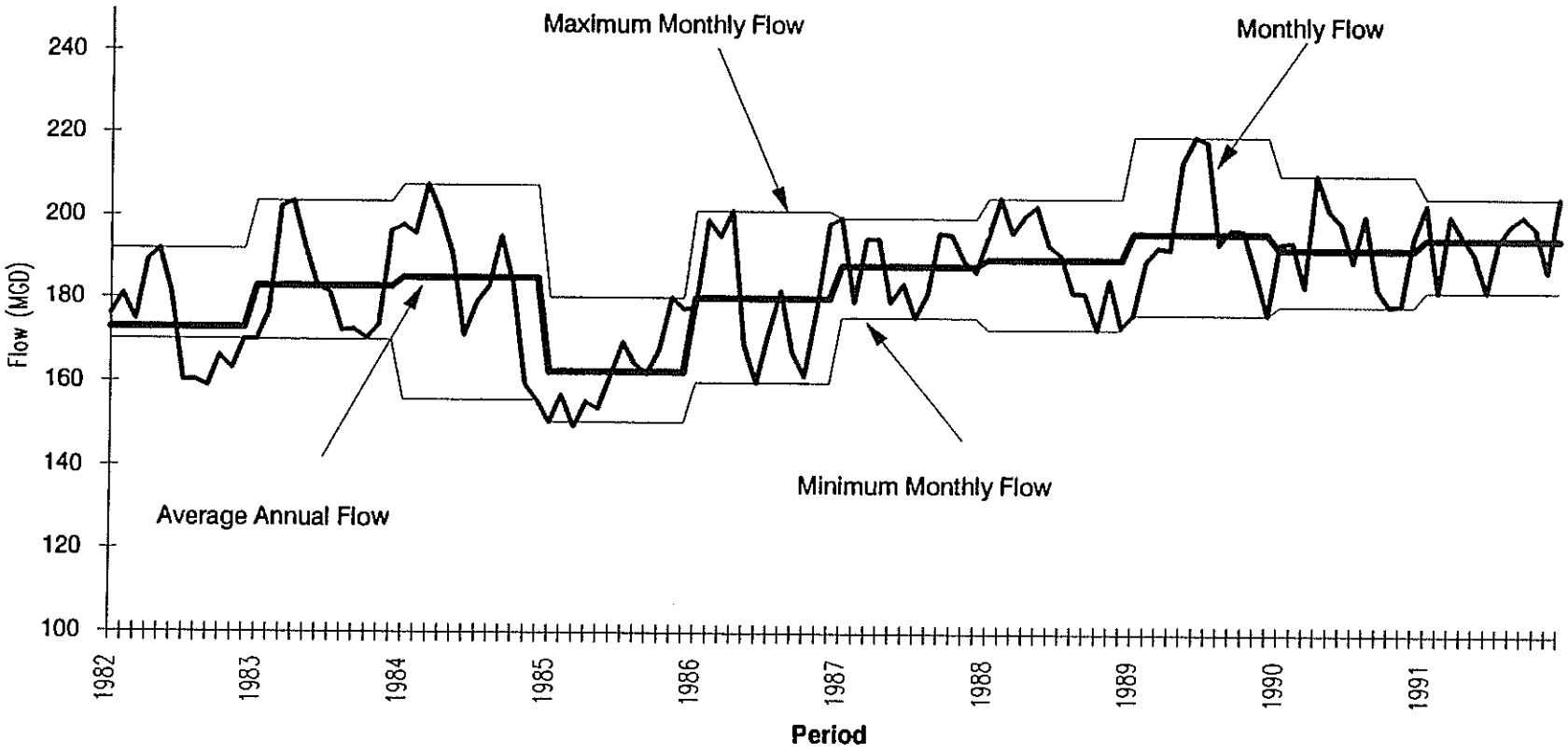

FIGURE 5.3-2
Southeast Water Pollution Control Plant - Monthly Flow

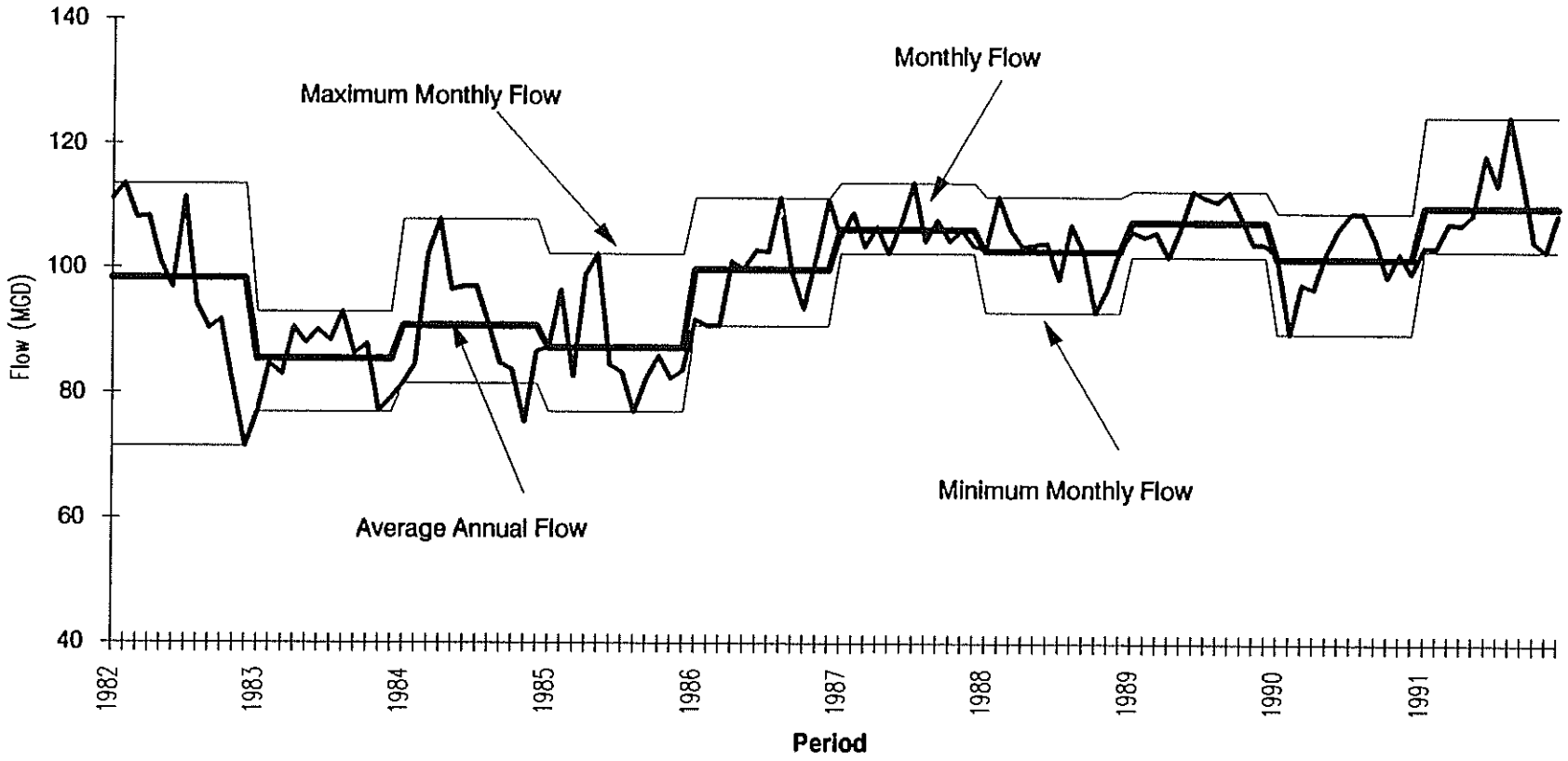

FIGURE 5.3-3
Southwest Water Pollution Control Plant - Monthly Flow

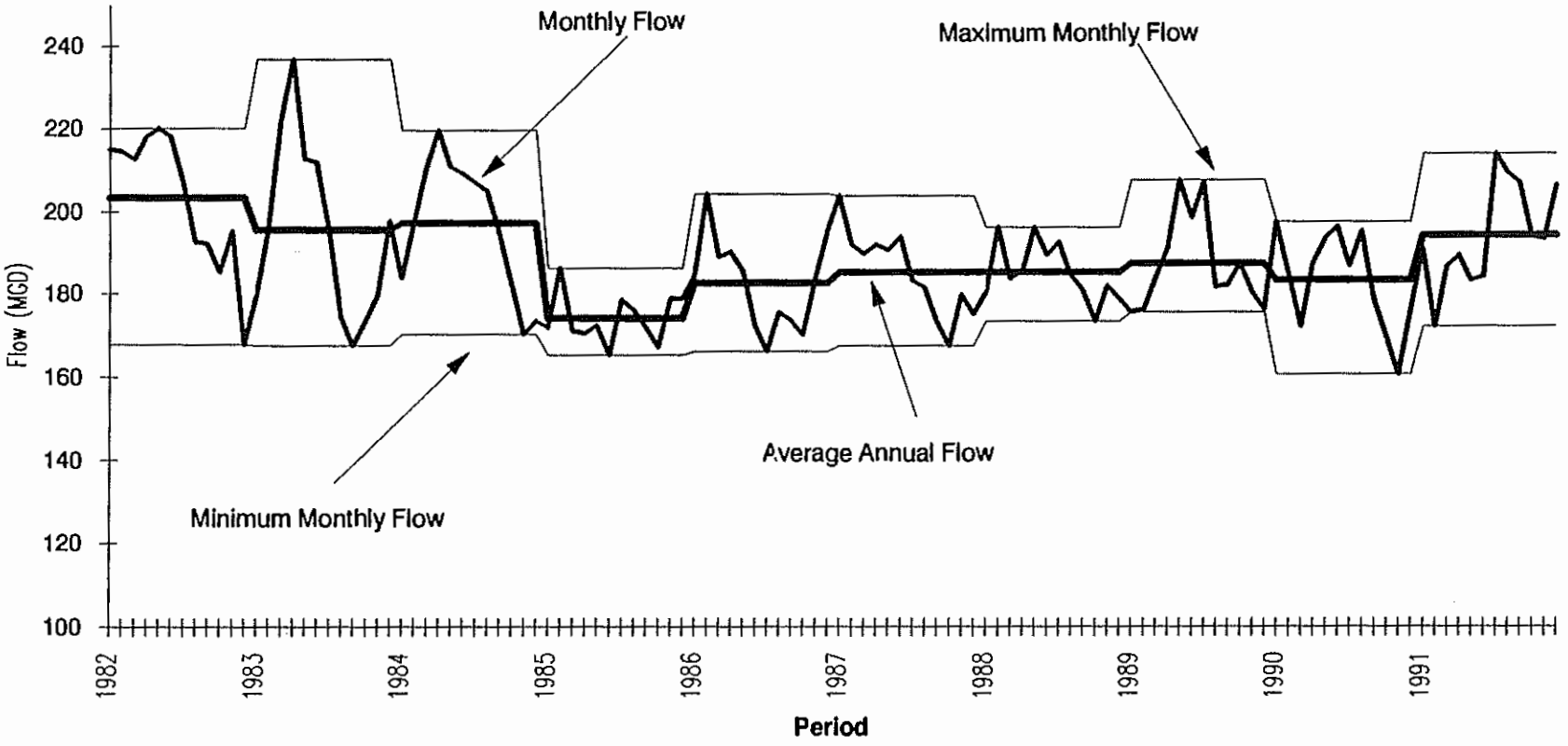

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TABLE 5.3.2

WASTEWATER BASEFLOW DERIVATION FOR EACH OF THE WPCPS

	NEWPCP (mgd)	Outlying Flow (mgd)	SEWPCP (mgd)	Outlying Flow (mgd)	SWWPCP (mgd)	Outlying Flow (mgd)	Rainfall (inches)
December 1989	176.63	31.72	104.08	0.64	176.14	59.83	1.21
November 1990	179.11	32.80	102.68	0.82	160.36	58.15	1.17
February 1991	182.36	35.08	103.65	0.89	171.95	68.15	0.75
Average	**179.4**	**33.2**	**103.5**	**0.8**	**169.5**	**62.0**	**1.04**

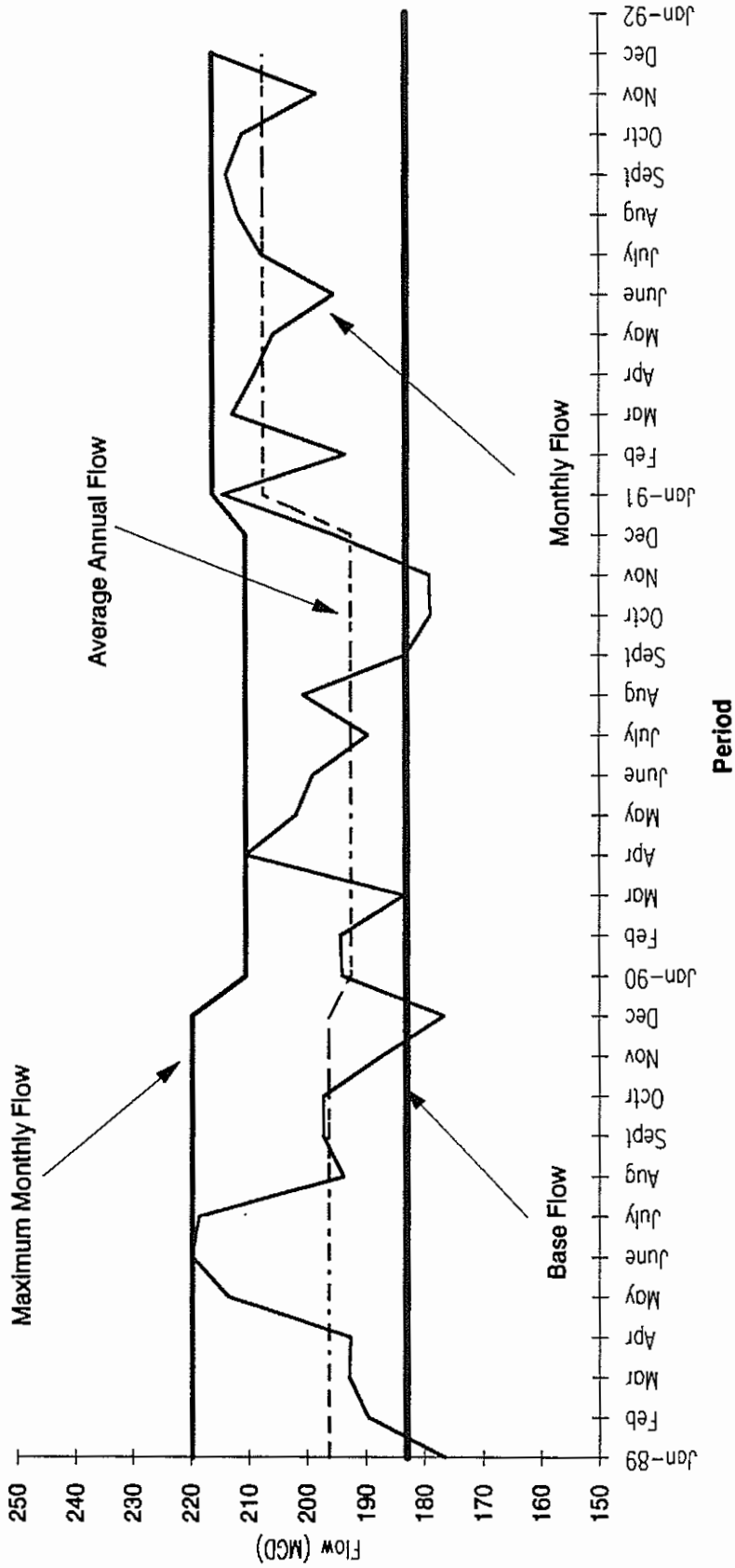

FIGURE 5.3-4
Northeast Water Pollution Control Plant -
Monthly Flow Per Day

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FIGURE 5.3-5
Southeast Water Pollution Control Plant -
Monthly Flow per Day

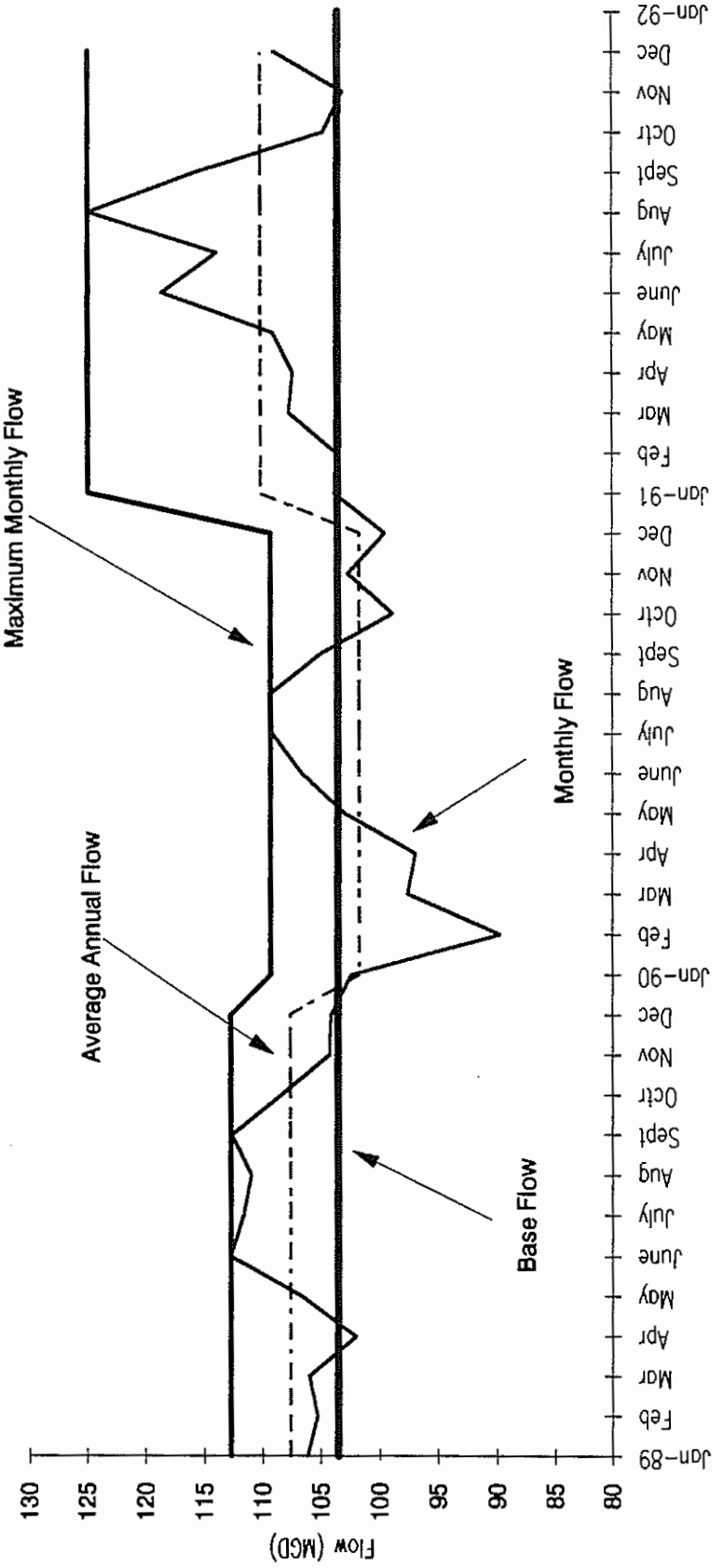

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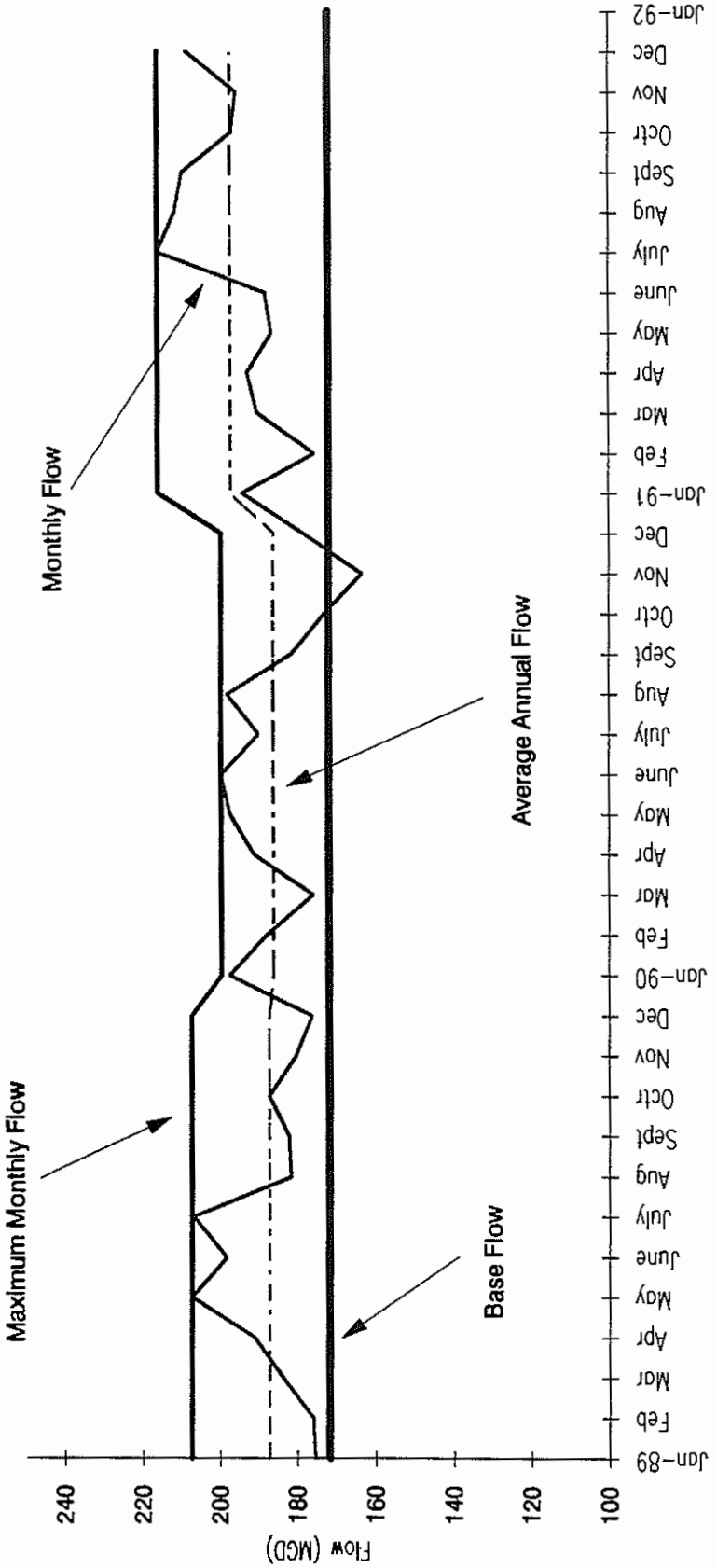
FIGURE 5.3-6
Southwest Water Pollution Control Plant
Monthly Flow per Day



It is recognized that there is some storm water included in the base flows and that these flows are not true dry weather flows since some rainfall did occur, albeit small, for those months from which the base flow is calculated. The base flow is that flow which is expected with a minimal effect by storm water inflow from the combined collection system. In order to verify this approach, a least squares linear regression statistical model has been applied to the monthly flow and rainfall data for this 3-year period (1989 to 1991) in order to calculate a statistical relationship between rainfall, wastewater flows from the outlying municipalities, and at the WPCPs. Regressing rainfall and wastewater flows essentially defines the ratio of these two values and can be used to project the dry weather flow (zero rainfall) as well as determine the statistical significance of the ratio. Although not included here, the regression model showed a significant statistical relationship between rainfall and WPCP flows and predicted base flows within 1.7 percent of those determined in Table 5.3.2 above (NEWPCP = 184.6 mgd, SEWPCP = 102.5 mgd, SWWPCP = 171.6), thus supporting this approach.

5.3.2 Infiltration/Inflow (I/I)

I/I rates were determined for each of the WPCPs City service areas in the three Sewer System Evaluation Surveys (SSESs) summarized in Section 2.5.2. These SSES reports represent the most comprehensive analysis of infiltration and inflow within the City to date. While recognizing that this information is somewhat dated, it has been incorporated into the categorization of the wastewater flows as the most definitive infiltration and inflow quantification conducted to date on the Philadelphia system.

Inflow is largely comprised of rainfall induced flow and is discounted in the development of the base flow to the WPCPs described above. In this evaluation, the base flow, use and reserve capacity of the WPCPs is considered during dry months to minimize the significant effects of storm water runoff on WPCP flows during and after rainfall events. Infiltration primarily originates from groundwater and represents a much more consistent impact on WPCP use and reserve capacity. When considering the present and future use and capacity of the City's wastewater facilities, infiltration must be included due to its consistent and significant impact on the hydraulic capacity of the wastewater system.

The infiltration and inflow from the collection system, not to be confused with storm induced flows from the combined sewer system, for the City service areas for each of WPCPs has been established as follows:

Northeast WPCP	74.9 mgd
Southeast WPCP	45.8 mgd
Southwest WPCP	62.4 mgd

I/I rates within a collection system would be expected to increase over time due to the continued aging of the collection system and deterioration of sewer lines. However, the PWD has a well established maintenance program (investing up to $13.5 million per year on the rehabilitation of sewer lines, see Section 4.2.1), that includes the rehabilitation of sewer lines subject to large amounts of I/I. Since there is no accurate way of projecting increasing levels of I/I over time,

particularly when factoring in significant rehabilitation efforts, the I/I rates have been assumed to remain constant on a drainage basinwide basis. Therefore, the same I/I levels to each of the WPCPs from the service areas within the City are assumed to remain constant for both the current and future projections. Based upon the above information, Table 5.3.3 indicates the breakdown of current flows.

5.3.3 Base Loadings of Suspended Solids (SS) and Biochemical Oxygen Demand (BOD)

As in common engineering practice, the loadings of suspended solids (SS) and Biochemical Oxygen Demand (BOD) are evaluated as significant indicators of the treatment capacity of each of the WPCPs. The Facility Reports for the WPCPs and the 201 Facility Report for the Sludge Processing and Distribution Center (SPDC) discussed above used SS and BOD loadings to derive the design criteria for treatment and capacity for these facilities. The evaluation presented herein is limited to comparing the current average loadings (1989 to 1991 averaged to arrive at a 1990 loading) to those levels assumed in the Facility Reports. The presumption in this evaluation is that the WPCPs and SPDC adequately handle the design loadings. Further, this methodology concludes that if the actual loadings experienced at the plant are lower than the design then there will be no significant problems with the facilities handling the loadings. A tabulation of the monthly wastewater flow and loadings for each of the WPCPs is presented in Tables 5.3.4 through 5.3.6 with a graphical representation of this data provided with each table as Figures 5.3-7 through 5.3-9.

In Table 5.3.7, the base loadings for SS and BOD measured at the WPCPs and averaged from Tables 5.3.4 and 5.3.6 above are compared to the design loadings presented in the WPCP and SPDC Facility Reports. As can be seen in this comparison, the actual influent concentrations and loadings of SS and BOD measured at each of the WPCPs are significantly less than those values projected in the design reports for these facilities. For instance, BOD concentration is 60.8, 48.8 and 54.4 percent of the design concentration for the Northeast, Southeast, and Southwest WPCPs, respectively. As mentioned above, our methodology concludes that since the actual loadings recently experienced at the WPCPs are significantly less than the loading levels that the WPCPs are designed to adequately treat, we expect no problems with loadings at the treatment facilities.

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TABLE 5.3.3

DERIVED WASTEWATER FLOWS AND INFILTRATION RATES AVERAGED FROM 1989 - 1991

WPCP	PHILADELPHIA					Outlying Municipalities[A]	Total[A]
	Domestic		Industrial Commercial Institutional	Infiltration	Total City Flow		
	(mgd)	Per Capita (gpcpd)	(mgd)	(mgd)	(mgd)	(mgd)	(mgd)
Northeast[B]	54.5 (30.4%)	71.7	16.8 (10.78%)	74.9 (41.7%)	146.2	33.2 (18.5)	179.4 (100%)
Southeast[C]	22.0(E) (21.3%)	63.5(E)	34.9 (33.7%)	45.8 (44.2%)	102.7	0.8 (0.8%)	103.5 (100%)
Southwest[D][F]	26.4 (15.6%)	55.2	18.7 (11%)	62.4 (37%)	107.5	62.0 (36.0%)	169.5 (100%)

Note: Wastewater production and infiltration rates were derived from the sewer system evaluation surveys (SSESs) referenced below. Infiltration rates were assumed to be constant with increases in infiltration rates due to increase age offset by on-going maintenance and rehabilitation programs. Domestic, industrial, commercial, and institutional wasteload sources were increased to current production rates in proportion to rates derived in the SSESs. Total plant flows and outlying municipality flow were derived from wastewater management reports.

(A) Mean of average low month flow 1989 -1991.

(B) Final report and Task B reports for sewer system evaluation, Northeast drainage district, City of Philadelphia, December 1981.

(C) Final report and Task B reports, sewer system evaluation survey, Southeast drainage district, City of Philadelphia, August 1981.

(D) Phase II evaluation of sewer infiltration/inflow, Part F - Cost-effective analysis and final report and task B reports, Southwest drainage district, City of Philadelphia, June 1983.

(E) Domestic flow derived from average of calculated per capita production rates derived for the Northeast and Southwest water pollution control plants.

(F) Phase II Evaluation of Sewer Infiltration/Inflow - Tide Gate/Regulator Evaluation Final Report, Southwest Drainage District, City of Philadelphia, 1982.

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TABLE 5.3.4

TABULATION OF THE MONTHLY FLOWS AND LOADINGS AT THE NORTHEAST WATER POLLUTION CONTROL PLANT 1989-1991

Month/Year	Flow (mgd)	SS Influent (mg/l)	Plant SS Loadings (lb/day)	BOD_5 Influent (mg/l)	Plant BOD_5 Loadings (lb/day)
January 1989	176.52	227	334,184	179	263,520
February	189.62	220	347,915	140	221,400
March	192.87	213	342,618	162	260,583
April	192.52	224	359,658	163	261,716
May	213.52	213	379,301	140	249,306
June	219.69	241	441,564	149	273,000
July	218.53	218	397,314	106	193,189
August	193.80	263	425,085	129	193,955
September	197.32	297	488,758	111	182,667
October	197.15	285	468,606	118	194,019
November	187.28	273	426,403	127	198,363
December	176.63	264	388,897	157	231,276
Year Ave.	**196.29**	**245**	**400,025**	**139**	**226,916**
January 1990	193.97	215	347,808	146	236,186
February	194.35	186	301,483	144	233,407
March	183.56	204	312,302	156	238,819
April	210.52	224	393,285	154	270,383
May	201.94	220	370,520	138	232,417
June	199.00	245	406,617	138	229,033
July	189.52	289	456,792	147	232,348
August	200.65	293	490,312	126	210,851
September	183.13	243	371,135	132	201,604
October	178.80	239	356,395	141	210,258
November	179.11	250	373,444	164	244,979
December	195.34	200	325,827	136	221,562
Year Ave.	**192.49**	**234**	**375,493**	**144**	**230,154**
January 1991	203.39	183	310,418	127	215,427
February	182.36	210	319,385	160	243,341
March	200.81	214	358,398	164	274,660
April	195.96	227	370,988	158	258,220
May	191.72	244	390,143	157	251,034
June	182.36	261	396,950	181	275,280
July	194.73	282	457,982	183	297,201
August	198.77	274	454,221	168	278,501
September	200.81	261	437,111	175	293,082
October	197.99	280	462,346	173	285,664
November	187.34	266	415,603	159	248,424
December	205.17	249	426,068	167	285,757
Year Ave.	**195.12**	**246**	**399,968**	**164**	**267,216**
3-Year Ave.	**194.63**	**242**	**391,829**	**149**	**241,429**

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TABLE 5.3.5

TABULATION OF THE MONTHLY FLOWS AND LOADINGS AT THE SOUTHEAST WATER POLLUTION CONTROL PLANT 1989-1991

Month/Year	Flow (mgd)	SS Influent (mg/l)	Plant SS Loadings (lb/day)	BOD_5 Influent (mg/l)	Plant BOD_5 Loadings (lb/day)
January 1989	106.17	119	105,369	118	104,484
February	105.30	127	111,532	129	113,288
March	105.98	111	98,110	115	101,645
April	101.98	105	89,304	107	91,005
May	106.65	127	112,962	75	66,710
June	112.72	136	127,852	80	75,207
July	111.64	127	118,247	69	64,244
August	110.99	166	153,659	71	65,722
September	112.63	91	85,479	60	56,360
October	108.43	106	95,856	76	68,727
November	104.26	110	95,648	81	70,432
December	104.08	133	115,448	105	91,143
Year Ave.	**107.57**	**122**	**109,122**	**91**	**80,747**
January 1990	102.36	122	104,149	88	75,124
February	89.70	105	78,550	96	71,817
March	97.56	121	98,452	101	82,179
April	96.90	134	108,292	91	73,541
May	102.92	181	155,362	89	76,393
June	106.62	147	130,714	77	68,469
July	109.15	127	115,722	51	46,426
August	109.28	116	113,787	50	45,570
September	104.95	130	105,524	74	64,771
October	98.85	128	114,751	78	64,304
November	102.68	134	104,569	84	71,934
December	99.51	126	104,569	82	68,053
Year Ave.	**101.71**	**131**	**111,290**	**80**	**67,382**
January 1991	103.78	97	83,956	72	62,318
February	106.65	99	85,580	83	71,749
March	107.67	139	124,818	98	88,001
April	107.36	122	109,237	81	72,526
May	109.09	115	104,628	68	61,867
June	118.58	120	118,675	67	66,260
July	113.93	144	136,825	58	55,110
August	124.87	135	140,591	64	66,651
September	115.71	157	151,508	78	75,272
October	104.72	121	105,677	71	62,009
November	103.07	126	108,310	77	66,189
December	108.97	121	109,966	87	79,006
Year Ave.	**110.37**	**126**	**114,981**	**75**	**68,918**
3-Year Ave.	**106.55**	**126**	**111,798**	**82**	**72,349**

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TABLE 5.3.6

TABULATION OF THE MONTHLY FLOWS AND LOADINGS AT THE SOUTHWEST WATER POLLUTION CONTROL PLANT 1989-1991

Month/Year	Flow (mgd)	SS Influent (mg/l)	Plant SS Loadings (lb/day)	BOD_5 Influent (mg/l)	Plant BOD_5 Loadings (lb/day)
January 1989	175.39	129	188,695	112	163,828
February	175.98	133	195,201	114	167,315
March	183.64	134	205,229	113	173,066
April	191.06	161	256,544	122	194,400
May	207.50	139	240,546	104	179,977
June	198.32	153	253,060	94	155,475
July	206.88	150	258,807	75	129,403
August	181.54	149	255,592	80	121,123
September	182.10	132	200,470	85	129,091
October	187.32	122	190,594	84	131,229
November	180.25	133	199,937	102	153,335
December	176.14	148	217,413	121	177,750
Year Ave.	**187.18**	**140**	**219,341**	**101**	**156,333**
January 1990	197.37	140	230,449	101	166,253
February	184.66	140	215,609	101	155,547
March	171.92	140	200,734	101	144,815
April	187.24	140	218,621	101	157,720
May	193.44	140	225,861	101	162,942
June	196.17	140	229,048	101	165,242
July	186.74	140	218,038	101	157,299
August	195.06	140	227,752	101	164,307
September	178.09	140	207,938	101	150,012
October	169.47	140	197,873	101	142,751
November	160.36	140	187,236	101	135,078
December	175.65	140	206,089	101	147,957
Year Ave.	**183.01**	140	**213,687**	101	**154,160**
January 1991	190.87	140	222,860	101	160,777
February	171.96	140	200,780	101	144,849
March	186.51	140	217,769	101	157,105
April	189.34	140	221,073	101	159,489
May	183.03	140	213,706	101	154,173
June	184.04	140	214,885	101	155,024
July	213.88	140	249,726	101	180,160
August	209.17	140	244,227	101	176,192
September	206.83	140	241,495	101	174,221
October	193.75	140	226,223	101	163,203
November	193.17	140	225,545	101	162,715
December	206.25	140	240,818	101	173,733
Year Ave.	**194.07**	140	**226,598**	**101**	**163,470**
3-Year Ave.	**188.09**	140	**219,873**	**101**	**157,988**

Figure 5.3-7
Northeast Water Pollution Control Plant
Monthly Flow and Loadings

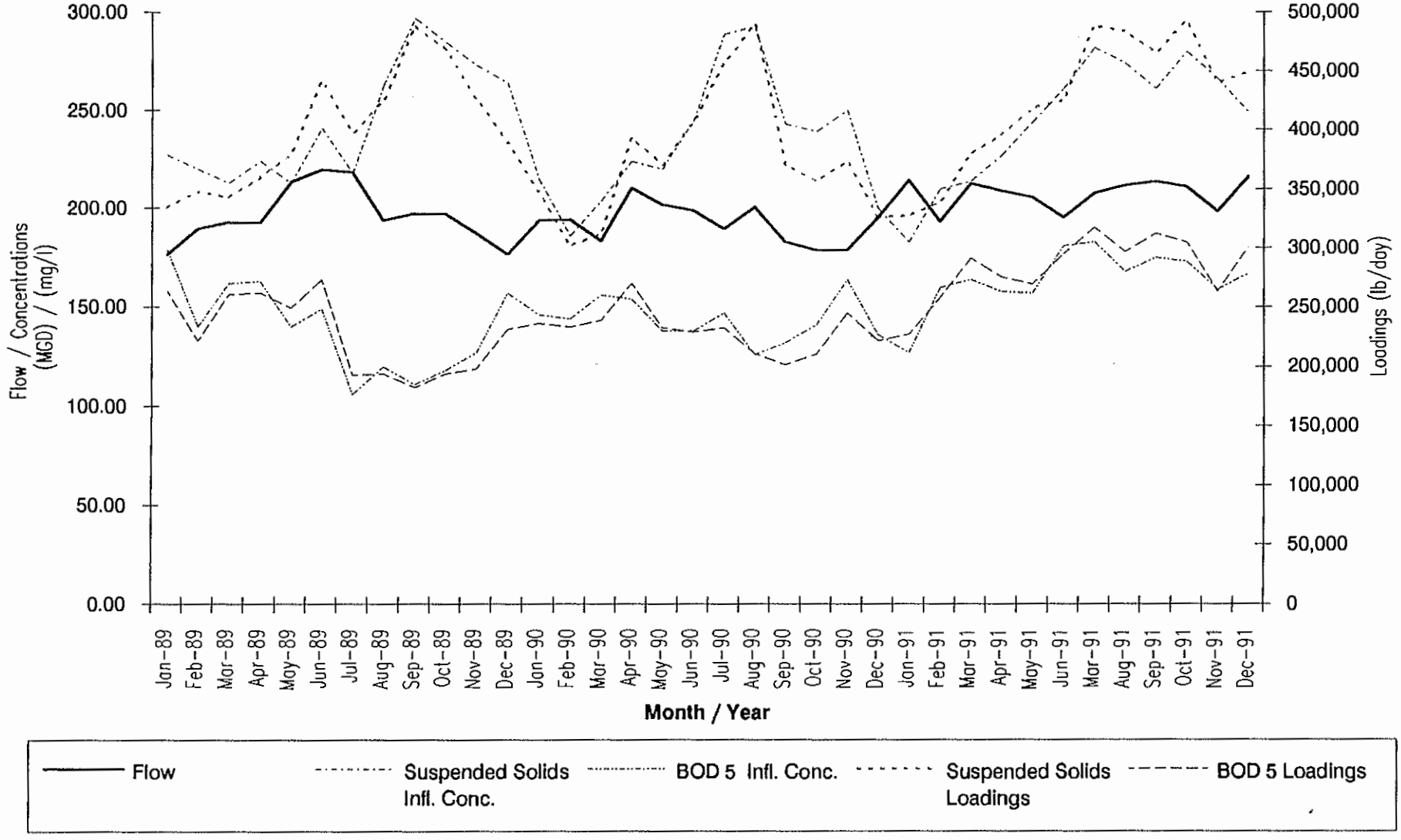

Figure 5.3-8
Southeast Water Pollution Control Plant
Monthly Flow and Loadings

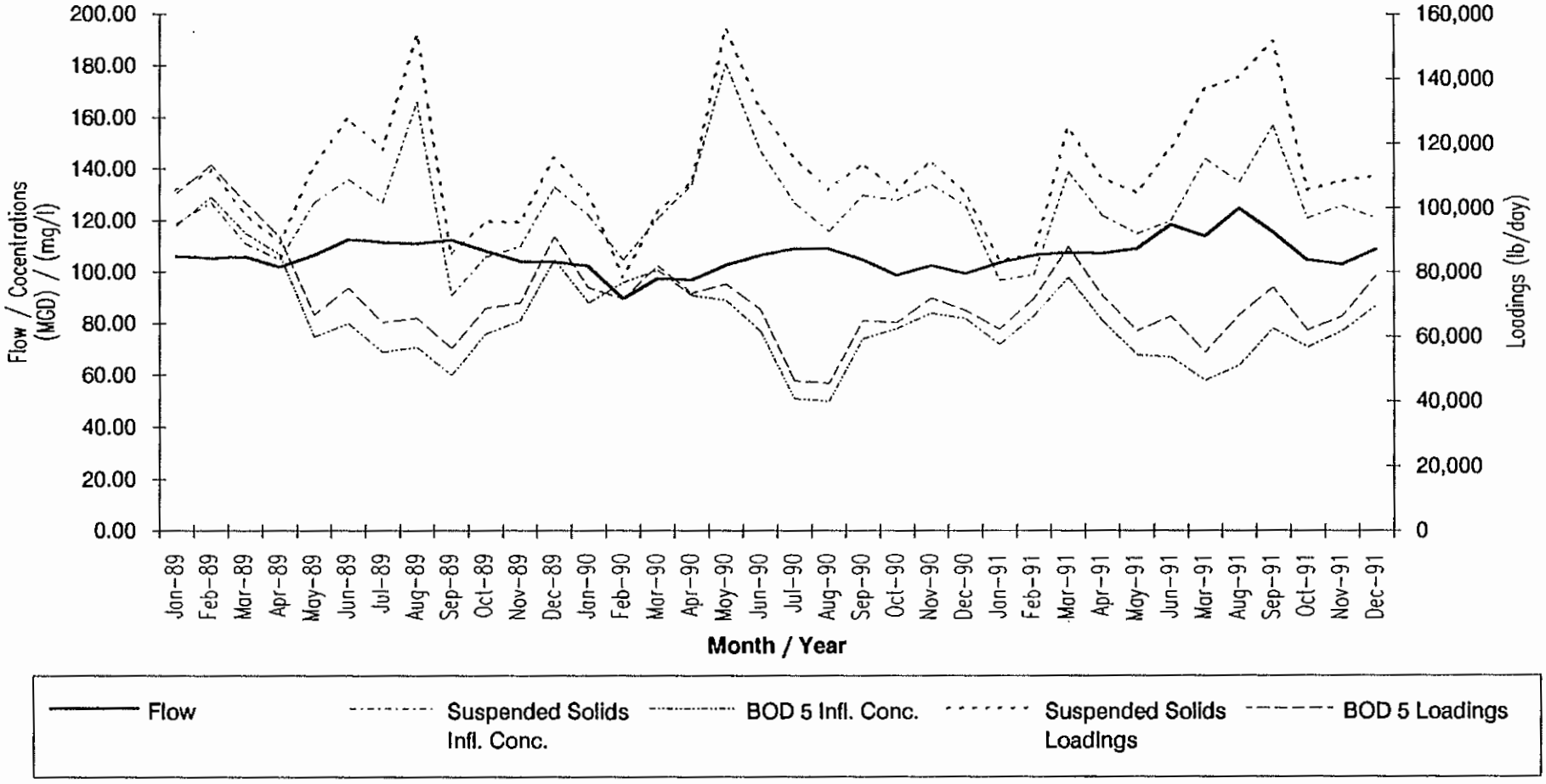

Figure 5.3-9
Southwest Water Pollution Control Plant
Monthly Flow and Loadings

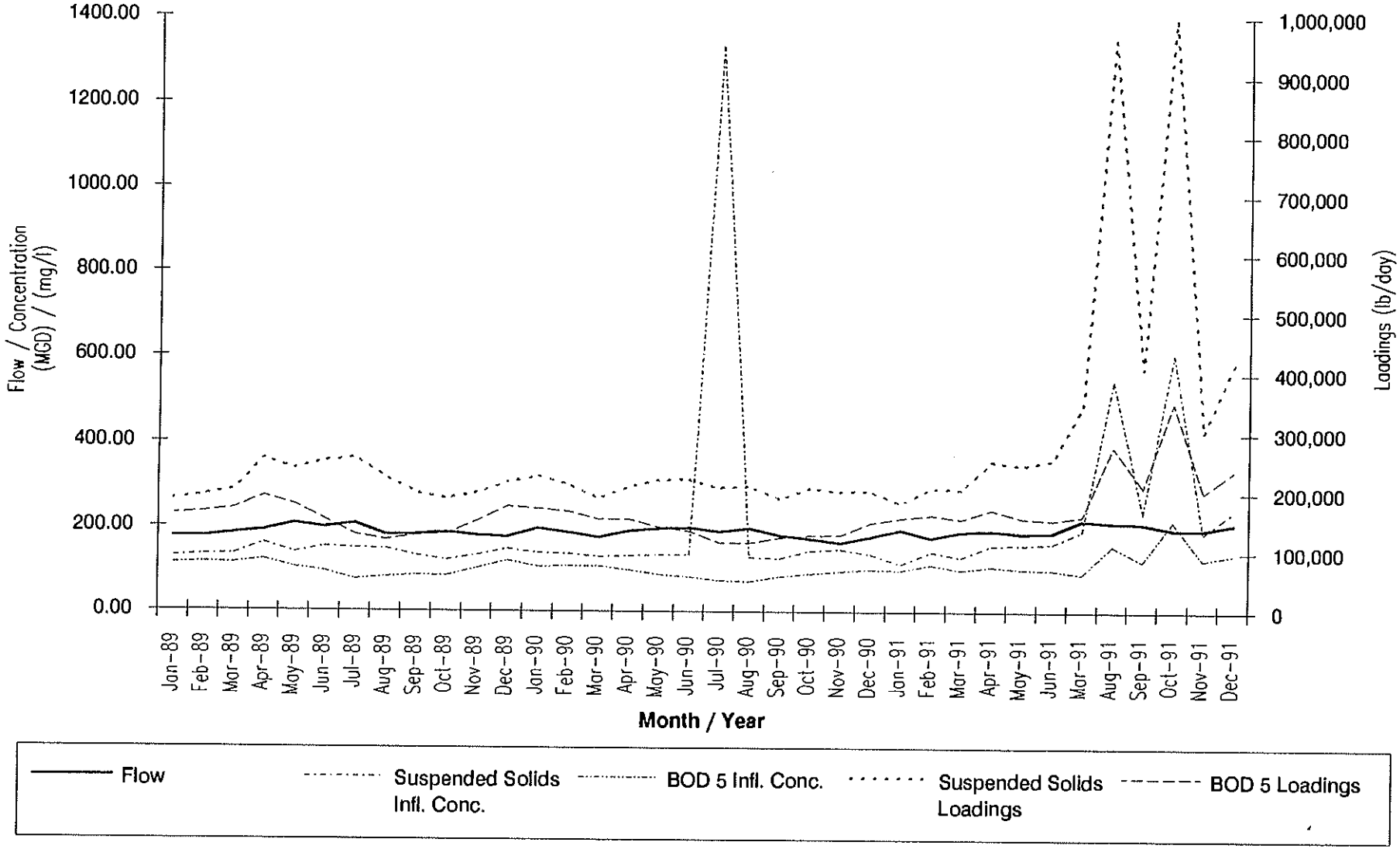

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TABLE 5.3.7
COMPARISON OF DESIGN vs. ACTUAL LOADINGS

	BOD (mg/l)	SS (mg/l)	BOD lb/day	SS lb/day
NEWPCP				
- Projected Facility Report - 250 mgd	245	323	510,000	674,000
- Rev. to Projections for NEWPCP of SWWPCP - 210 mgd	201	271	350,343	472,353
- Average (1989 - 1991)	149	242	241,429	391,829
- Max Month (1989 - 1991)	183	297	297,201	490,312
% Use of Design at NEWPCP	---	---	58.3%	72.7%
SEWPCP				
- Projected Facility Report - 140 mgd	168	178	196,000	208,000
- Projected SPDC Report - 120 mgd	156	181	156,000	181,150
- Average (1989 - 1991)	82	126	72,349	111,798
- Max Month (1989 - 1991)	129	181	113,288	155,362
% Use Design at SEWPCP			57.8%	74.7%
SWWPCP				
- Projected Facility Report - 210 mgd	193	279	339,000	488,000
- Rev. to Projections for NEWPCP of SWWPCP - 200 mgd	117	214	194,220	355,240
- Average (1989 - 1991)	101	140	157,988	219,873
- Max Month	122	161	194,400	258,807
% Use of Design at SWWPCP			57.3%	74.7%
Total SPDC Design Criteria			700,563	983,593
Total Average (1989 - 1991)			485,910	788,85
% Use of Design at SPDC			69.4%	80.1%

The loadings of these pollutants in pounds per day is a more significant indicator of potential problems at the SPDC since this facility is designed to handle the combined loadings removed from the wastestreams at all three WPCPs. As summarized at the bottom of Table 5.3.7, the total loadings from the three WPCPs are 69.4 percent of the design loading for BOD and 80.1 percent of the SS. Again, since the actual loadings measured at the WPCPs are less than the design loadings, we expect no overall capacity problems at the SPDC.

5.3.4 Projected Flows from the Outlying Municipalities/Authorities

A detailed description of the relationship between Philadelphia and the 10 outlying municipalities/authorities with regards to the transport, treatment, and disposal of wastewater is presented in Section 3.2. Philadelphia is contractually committed to supplying wastewater services to these neighboring bodies for varying periods of time; however, these relationships with varying conditions and needs are expected to continue indefinitely. In order to provide a comprehensive and meaningful evaluation of the potential needs of the Philadelphia wastewater system, it is essential to give adequate consideration to the potential demands that the outlying municipalities/authorities will have in the future. However, a detailed categorization of the wastewater flows and a projection of these flows based upon component sources is beyond the scope of this report. The following methodology was developed to provide an effective and conservative consideration of the potential impact of the needs of the outlying municipalities/authorities as to Philadelphia wastewater system.

The potential impact on future needs of the Philadelphia wastewater system by the outlying municipalities/authorities is considered in the context of the following criteria.

- Philadelphia must reserve capacity to accommodate those flows and loadings that is has contractually agreed to accept.

- What is the potential a municipality/authority would need additional flow and/or loading capacities and the contractual amounts within the planning period?

- In order to ascertain whether there may be any future need to revisit these capacities, information regarding each municipality/authority that contributes to the WPCP collection/conveyance system was compiled from the Planning Commissions of Bucks, Delaware, and Montgomery Counties, and the Delaware Valley Regional Planning Commission.

As can be seen in Table 3.2.1, most of the outlying municipalities/authorities contribute wastewater flows well below those flow limits defined in their respective contractual agreements. Indeed, as can be seen below in Table 5.3.8, flow averaged over our study period 1989 to 1991 from the outlying municipalities/authorities for each of the WPCPs is significantly below the contractual limited volumes.

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TABLE 5.3.8

COMPARISON OF ACTUAL OUTLYING FLOWS TO CONTRACTUAL LIMITS PER WPCP 1989 - 1991

WPCP	Flow from Outlying Municipalities/Authorities Averaged 1989 - 1991 (mgd)	Contractual Limits[1] (mgd)	Percent Utilization (%)
NEWPCP	33.2	51.9	64.0
SEWPCP	0.8	1.0	80.0
SWWPCP	62.0	83.8	74.0

[1]Contractual limits for each WPCP based upon individual intermunicipal agreements.

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Since it is not expected that a significant increase in flows is expected from the outlying municipalities/authorities, the maximum contractual amount will be assumed for each of the WPCPs. While this will result in a conservative evaluation with regard to forecasting wastewater flow at the WPCPs, PWD must have reserve capacity available equal to that which it is contractually obligated to provide. Therefore, the amount of forecasted flows will actually be less than that presented below; however, considerations as to the amount of reserve capacity must exclude that capacity which must be in reserve for the outlying municipalities/authorities.

5.4 FORECASTS OF WASTEWATER FLOWS AND LOADINGS

Based upon the above and the projected population decline outlined in Section 5.2, the projected wastewater base flows for 1996, 2000, and 2010 are presented in Table 5.4.1, Projected Wastewater Flows.

As discussed in this table, these projected flows are exclusive of rainfall induced flows that have a significant impact on flows at each of the WPCPs. Based upon these projected flows, the WPCPs have the theoretical reserve capacity presented in Table 5.4.2.

As mentioned in Table 5.4.2, the decrease in wastewater base flows is forecasted primarily based upon the decline in domestically generated flow. As discussed, the ICI generated flow is assumed to remain constant. In order to evaluate the reasonableness of this assumption, we have evaluated how much theoretical office space/industrial space would have to be generated in any of the WPCPs to provide a noticeable effect on plant capacity. In order to conduct this evaluation, some gross assumptions are necessary, namely that a proposed commercial/industrial institutional facility would generate 0.125 gallons per day per square foot. This results in 125,000 gpd/million square feet. Conversely, there would need to be 8 million square feet of ICI development to generate 1 mgd at any of the WPCPs. In order to have a significant impact on the WPCPs, the amount of ICI development needed is presented in Table 5.4.3.

It should be noted that each of these amounts of development represent significantly more development than is potentially considered reasonable. The 20-year average represents the amount of development for each of the 20 years to be absorbed to make an impact on the reserve wastewater production for each of the WPCPs. Indeed, it is not expected that the entire City will absorb 50 to 70 million square feet within the planning period, let alone one of the WPCP's service areas.

Furthermore, the reserve capacities used in this evaluation are based on a maximization of flows from the outlying municipalities/authorities, thus further representing a conservative estimate. The PWD is contractually obligated to retain enough reserve capacity at each WPCP to handle to maximum amounts of flow and loadings as allocated in the intermunicipal agreements. The premise that the total allocated capacity for the outlying municipalities is added to the projected City flows results in the projected increase in WPCP flows from 1990 to 1996. The subsequent decline in projected flows from 1996 to 2010 reflects the projected decline in the City's population over this period of time as discussed previously. Based upon this evaluation and wastewater flow

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TABLE 5.4.1

PROJECTED WASTEWATER FLOWS (DRY WEATHER)

Water Pollution Control Plant	Philadelphia					Outlying Municipalities	Total
	Domestic Base Flow		Industrial Commercial Institutional	Infiltration (B)(C)(D)	Total City Flow		
	Total (mgd)	Per Capita (gpcpd)	(mgd)	(mgd)	(mgd)	(mgd)	(mgd)
1990							
Northeast	54.5	71.7	16.8	74.9	149.8	33.2 (A)	179.4(A)
Southeast (E)	22.0	63.5	34.9	45.8	102.7	0.8 (A)	103.5(A)
Southwest	26.4	55.2	18.7	62.4	107.5	62.0 (A)	169.5(A)
1996							
Northeast	53.8	71.7	16.8	74.9	149.1	51.9	197.4
Southeast (E)	21.2	63.5	34.9	45.8	101.9	1.0	102.9
Southwest	25.8	55.2	18.7	62.4	106.9	83.75	190.7
2000							
Northeast	53.4	71.7	16.8	74.9	148.7	51.9	197.0
Southeast (E)	20.6	63.5	34.9	45.8	101.3	1.0	102.3
Southwest	25.3	55.2	18.7	62.4	106.4	83.75	190.2
2010							
Northeast	52.2	71.7	16.8	74.9	147.5	51.9	195.8
Southeast (E)	19.4	63.5	34.9	45.8	100.1	1.0	101.1
Southwest	24.3	55.2	18.7	62.4	105.4	83.75	189.2

(A) Mean of average low month flow 1989-1991.

(B) Final Report and Task B Reports for Sewer System Evaluation, Northeast Drainage District, City of Philadelphia, December 1981.

(C) Final Report and Task B Reports, Sewer System Evaluation Survey, Southeast Drainage District, City of Philadelphia, August 1981.

(D) Phase II Evaluation of Sewer Infiltration/Inflow, Part F - Cost Effective NE Analysis and Final Report and Task B Reports, Southwest Drainage District, City of Philadelphia, June 1983.

(E) Domestic flow derived from average of calculated per capita production rates derived for the Northeast and Southwest Water Pollution Control Plants.

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TABLE 5.4.2

WPCP RESERVE CAPACITIES

WPCP/Year	Existing Projected Dry Weather Flow (mgd)	Current Permitted Flow (mgd)	Reserve Capacity (mgd)
NEWPCP			
1990	179.4	210.0	30.6
1996	197.4	210.0	12.6
2000	197.0	210.0	13.0
2010	195.8	210.0	14.2
SEWPCP			
1990	103.5	112.0	8.5
1996	102.9	112.0	9.7
2000	102.3	112.0	9.1
2010	101.1	112.0	10.9
SWWPCP			
1990	169.5	200.0	30.5
1996	190.7	200.0	9.3
2000	190.2	200.0	9.8
2010	189.2	200.0	10.8

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TABLE 5.4.3

ICI DEVELOPMENT NECESSARY TO HAVE A SIGNIFICANT IMPACT ON WPCP RESERVE CAPACITY

WPCP	Reserve Capacity (Worst Case) (mgd)	ICI Development (million square feet)	20-Year Average (million square feet)
NEWPCP	12.6 (1996)	72	3.6
SEWPCP	9.1 (2000)	57	2.9
SWWPCP	9.3 (1996)	58	2.9

forecasts, such flows are not expected to have any significant impact on the reserve capacity of the Philadelphia WPCPs.

There is no data or information which would suggest that the SS and BOD concentrations of the waste flows to the Philadelphia WPCPs might increase significantly through 2010. Therefore, the monthly average SS and BOD concentrations recorded at the WPCPs from 1989 - 1991 were used with the projected wastewater flows, as discussed above and presented in Table 5.4.1, to derive projected SS and BOD wasteloadings. Tables 5.4.4 and 5.4.5 illustrate the projected SS and BOD loadings, respectively, for 1996, 2000 and 2010, to the individual WPCPs to derive the projected loadings for the SPDC. As with the projected wastewater flows from which they were derived, these loadings are based on the assumption that the outlying municipalities contribute up to their contractually allocated capacities as soon as 1996. As with the projected flows, this results in a conservative estimate of projected wastewater loadings. By comparing these projected loadings with the design criteria established in the Facility Reports for each WPCP and SPDC, we can see that the projected loadings are well within the design criteria for all these facilities.

In order to project a worst case scenario, Tables 5.4.4 and 5.4.5 also tabulate the potential high loadings for the WPCPs by calculating projected loadings using the projected waste flows and maximum loadings from our three year study period of 1989 to 1991. A worst case scenario for the SPDC is also calculated in these tables by totalizing the loadings for the WPCPs; however, this derivation is not truly reflective of a real potential loading since the maximum monthly loadings recorded at each WPCP, and subsequently used to calculate projected maximum loadings did not occur concurrently at the WPCPs. Even with this very conservative approach to these projected maximum loadings, a comparison with the design loadings as presented in the Facility Reports and SPDC show that there is reserve loading capacity at these facilities through 2010.

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TABLE 5.4.4

PROJECTED SUSPENDED SOLIDS LOADINGS 1990 - 2010

Water Pollution Control Plant	Projected Flow (mgd)	Average Concentration		Maximum Month Concentration	
		Projected Concentration (mg/l)	Projected Concentration (lbs/day)	Projected Concentration (mg/l)	Projected Loading (lbs/day)
1990					
Northeast	179.4	242[1]	362,079	297[4]	453,534
Southeast	103.5	125[2]	108,821	181[5]	156,322
Southwest	169.5	141[3]	197,908	161[6]	227,594
SPDC			668,808		837,450[7]
1996					
Northeast	197.4	242	398,408	297	736,654
Southeast	102.9	125	107,273	181	155,416
Southwest	190.7	140	222,661	161	256,061
SPDC			728,342		1,148,131[7]
2000					
Northeast	197.0	242	397,601	297	487,965
Southeast	102.3	125	106,648	181	154,416
Southwest	190.2	140	222,078	161	255,389
SPDC			726,327		897,864[7]
2010					
Northeast	195.8	242	395,179	297	484,998
Southeast	101.1	125	105,397	181	152,698
Southwest	189.2	140	220,910	161	254,046
SPDC			721,486		891,742[7]

Notes:

(1) Average Monthly Flow January 1989 - December 1991 (Typ).
(2) Average Monthly Flow January 1989 - December 1991 (Typ).
(3) Average Monthly Flow January 1989 - July 1991 (Typ).
(4) Maximum Monthly Concentration from January 1989 - December 1991 (Typ).
(5) Maximum Monthly Concentration from January 1989 - December 1991 (Typ).
(6) Maximum Monthly Concentration from January 1989 - July 1991 (Typ).
(7) Not reflective of true projected loading conditions since maximum monthly loadings recorded at each WPCP and used to calculate projected maximum loadings did not occur concurrently at the WPCPs.

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TABLE 5.4.5

PROJECTED BOD LOADINGS 1990 - 2010

Water Pollution Control Plant	Projected Flow (mgd)	Average Concentration		Maximum Month Concentration	
		Projected Concentration (mg/l)	Projected Concentration (lbs/day)	Projected Concentration (mg/l)	Projected Loading (lbs/day)
1990					
Northeast	179.4	149(1)	222,933	183(4)	273,804
Southeast	103.5	82(2)	70,820	129(5)	111,412
Southwest	169.5	101(3)	154,160	122(6)	172,463
SPDC			447,913		557,679(7)
1996					
Northeast	197.0	149	245,301	183	301,276
Southeast	102.3	82	70,410	129	110,766
Southwest	190.2	101	160,634	122	194,033
SPDC			476,345		606,075
2000					
Northeast	195.8	149	245,301	183	300,665
Southeast	101.1	82	69,999	129	110,120
Southwest	189.2	101	160,213	122	193,525
SPDC			475,513		604,310(7)
2010					
Northeast	199.4	149	243,313	183	298,834
Southeast	101.1	82	69,178	129	108,829
Southwest	191.3	101	159,371	122	192,507
SPDC			471,862		600,170(7)

Notes:

(1) Average Monthly Flow January 1989 - December 1991 (Typ).
(2) Average Monthly Flow January 1989 - December 1991 (Typ).
(3) Average Monthly Flow January 1989 - December 1991 (Typ).
(4) Maximum Monthly Concentration from January 1989 - December 1991 (Typ).
(5) Maximum Monthly Concentration from January 1989 - December 1991 (Typ).
(6) Maximum Monthly Concentration from January 1989 - July 1991 (Typ).
(7) Not reflective of true projected loading conditions since maximum monthly loadings recorded at each WPCP and used to calculate projected maximum loadings did not occur concurrently at the WPCPs.

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6.0 DEVELOPMENT AND ASSESSMENT OF NEEDS

6.1 FIVE-YEAR NEEDS

This section of the Act 537 Plan will develop and assess the short-term needs for the PWD wastewater collection and treatment system. Planning and Research (P&R) Section of the PWD, which is responsible on an ongoing basis for needs assessment and prioritization.

The development of conclusions herein relies in large part on information made available for this report. The needs will be discussed first for the WPCPs and thereafter for the collection system and Sludge Processing and Distribution Center (SPDC).

As regards the assessment of needs for treatment, there are primarily four general sources of information that have been utilized in this evaluation:

- A general unit process evaluation at each plant that compares the basis of design as well as existing and projected loadings to PaDER criteria
- The PWD's Capital Improvement Plan (CIP) for the WPCPs
- Recent studies on the WPCPs
- The findings of field investigations at the WPCPs

6.1.1 NEWPCP

6.1.1.1 Process Evaluation

A general approach to evaluation of WPCP capacity can be accomplished by comparison of plant design and operating criteria to PaDER design guidelines; incorporated into this approach is a determination of reserve capacity based upon current and projected dry weather loadings. This evaluation does not consider detailed aspects of design in the case of each unit process and is not intended to be used in lieu of any final design assessments; however, it does provide an effective summary evaluation of the WPCPs.

Table 6.1.1 is a process evaluation summary for the NEWPCP that compares the plant's basis of design to PaDER design criteria. As discussed in Section 2.5 of this report, the design capacity prior to the last upgrade was based upon 250 mgd. The plant is currently rated at a monthly flow of 210 mgd. As developed in Section 5.0, current dry weather flows for this plant over the past three years have averaged 179.4 mgd, which is well below the annual average (design) flow. Based upon the existing combined sewer overflow (CSO) operations, the following summarizes the NEWPCP loading conditions:

TABLE 6.1.1

NEWPCP PROCESS EVALUATION SUMMARY

Unit	Number	Dimensions	Existing Capacity	Design Parameter	NEWPCP Design Basis	PADER Guidelines
Mechanical Sewage Screens	8	8 ft. channel width 1 inch bar spacing	1.70 cf/MG screenings removed	Bar spacing Velocity	1 inch 3.0 FPS minimum	5/8 - 1-3/4 inches 1.25 - 3.0 FPS
Grit Removal	4	55' x 56'	6.4 cf/MG Grit removal	Velocity Maximum flow	---- 125 MGD	1 FPS ---
Primary Sedimentation				Surface loading rate		
Set 1	8	240' x 65 x 10' swd	105 MGD	Average	840 gpd/ft^2	<1,000 gpd/ft^2
Set 2	4	250' x 125' x 10' swd	105 MGD	Peak	1,680 gpd/ft^2	<2,500 gpd/ft^2
				BOD removed	22.5%	30-35%
Aeration Tanks	7	372' x 22' x 15' swd	23 MGD			
Rotating Biological Contactors	280	25' x 12' diameter		Loading rate	7.5 gpd/ft^2	1-3 gpd/ft^2
Final Sedimentation Tanks						
Set 1	8	214' x 75' x 11' swd	105 MGD	Design surface loading	815 gpd/ft^2	<800 gpd/ft^2
Set 2	8	231' x 70' x 13' swd	105 MGD	rate	810 gpd/ft^2	<800 gpd/ft^2
				Weir loading	15,200 gpd/ft	<15,000 gpd/ft
Disinfection	6	300' x 28' x 11' swd	4.11 MG	Contact period		
				Average	35 minutes	30 minutes
				Peak	---	15 minutes
				chlorine dose	8 mg/l	8 mg/l
Sludge Thickening	12	90' x 20' x 12' swd	237,600 ft^3	Solids loading	11.0 ppd/ft^2	20 lbs/day/ft^2
				Hydraulic loading	420 gpd/ft^2 (0.29 gpm/ft^2)	0.8 gpm/ft^2
Sludge Digesters						
Set 1	8	110' diameter x 30' swd	17.95 MG	Side water depth	30'	>20'
				Volatile solids loading	99 lbs VSS/1,000 cf/day	<100 lbs VSS/1,000 cf/day

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NEWPCP	Flows (MGD)		
	Average Monthly	Maximum Day	Peak
Original Design	250		
Design/Permit	210	315	420
Current	179.4*	---	---
Projected 5-year	197.4*	---	---

Note: Current Flows based upon 3-year (1989-1991) average
*Denotes dry weather flows

As can be seen, the plant capacity, based upon dry weather flows, appears to be satisfactory for both current and projected conditions. It should be noted that the projected wet weather flows will be more dependent upon CSO Operations (storm flow) than on the projected domestic flow and therefore cannot be predicted.

6.1.1.2 Plant Improvements

Budgeted Improvements

Improvements to the NEWPCP facilities are required on an ongoing basis to maintain the reliable operation of current equipment, implement upgrades to the existing equipment, and ensure compliance with discharge (regulatory) requirements. Forecasting of improvements allows the inclusion of such necessary improvements into projected operating budgets for future years. The PWD has forecasted improvements for the NEWPCP that are included in the projected operating budgets for fiscal years up to and including 1996. These budgeted improvements include, for example: mechanical equipment maintenance for such items as pumps, blowers, mixers, RBCs, and sedimentation tank sludge/scum removal equipment; grit incinerator refractory and mechanical rebuild; and general instrumentation/control and maintenance equipment necessary to assess the integrity of key process equipment. The following summarizes funding above the Fiscal Year 1993 base budget that has been budgeted for ongoing improvements to the NEWPCP:

BUDGETED IMPROVEMENT COSTS	FISCAL YEAR		
	1994	1995	1996
	$850,000	$625,000	$530,000

Non-Budgeted Improvements

Frequently, improvements to equipment or facilities are not of a routine matter and therefore cannot be anticipated or the implementation of an improvement may have been postponed from previous years. A partial listing of key items which have been identified by the PWD that are recommended for a future budget are summarized in the following paragraphs. An indication of the rationale for such improvements and the suggested fiscal year in which the improvement should be implemented are also presented:

- Dissolved Air Flotation Polymer Addition System (FY 93) - Installation of a polymer system for the DAF tanks if testing determines polymer addition would improve the solids removal and reduce the volume of sludge produced.

- Furnish and Install a Flow Control Valve for Final Sedimentation Tanks (FST) Set 1 (FY 94) — A flow control valve is required for FST Set 1 to better balance flow to both sets of tanks.

- Redesign and Replace Mixers in the Chlorine Retention Basins (FY 94) — Mixers in the chlorine retention basin have failed.

- Aeration Tank Odor Control (FY 94) — Citizen complaints of odor from the NEWPCP have resulted in considerations to install an odor control system on the aeration tanks.

- Odor Control System for Primary Sedimentation Tanks (PST) (FY 96) — Citizen complaints have resulted in considerations to install an odor control system for the PSTs.

More stringent discharge limitations or other Regulatory requirements that may be instituted in the future could require the installation of new treatment facilities that have not been forecasted in the Capital Budget Program. Some potential capital improvement requirements are summarized below:

- Nutrient Removal - A requirement to remove phosphorus and/or nitrogen from the discharged water may precipitate the installation of additional treatment processes that would require investigations into the best means of removal.

- Dechlorination - A requirement to remove free chlorine from the effluent after disinfection could require the installation of additional treatment facilities.

- Odor Control - Additional odor control requirements could be instituted depending upon the effectiveness of current and planned odor control projects. Alternative evaluations should be initiated in the near future.

6.1.1.3 Rehabilitation of Four Primary Clarifiers at the Northeast Water Pollution Control Plant

A major rehabilitation effort of the original primary clarifiers to ensure the continued successful operation and adequate treatment of wastewater is currently underway at the NEWPCP. This project, which was bid out in September 1990, includes:

1. The comprehensive structural, mechanical, and electrical rehabilitation of the four original primary clarifiers (Set 2) and replacement of the influent channels

2. Construction of a new Scum Pumping Station to service the primary clarifiers

The upgrade of the NEWPCP from primary to secondary treatment (Section 2.5.1.1) included the installation of eight new primary clarifiers to augment the four existing primary clarifiers constructed in the late 1940s as part of the original plant. The newer clarifiers have been referred to as Set 1, while the original clarifiers are identified as Set 2. Both sets of clarifiers are shown on Figure 3. The design criteria and dimensions for each set of clarifiers is presented here in Table 6.1.2.

The four primary clarifiers of Set 2 have been in use since the initiation of operation of the NEWPCP in 1951. PWD recognized that these clarifiers were approaching their design life and initiated plans for their rehabilitation in order to avoid loss of treatment capability and possible degradation of effluent quality. Several considerations make the rehabilitation of Set 2 of the primary clarifiers the logical and effective solution to the degraded state of these facilities, including:

- The present configuration has established a historical record of meeting the established NPDES permitted limits; thus, the existing system has proven to be effective.

- The property requirements and treatment train were already laid out and set aside for these facilities.

- The footprint of the clarifiers will not be changed, thus minimizing adverse environmental impacts.

- The footprint of the new Scum Pumping Station is very small and includes no additional property acquisition or major modification to the NEWPCP.

- All previous and contemporary planning and facility documents are consistent with this plant treatment train and capability.

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TABLE 6.1.2

NEWPCP - DESIGN CRITERIA AND DIMENSIONS OF THE PRIMARY CLARIFIERS

Primary Clarifiers	Set 1	Set 2
Waste Flow - MGD	105	105
Number of Tanks	8	4
Size Each Tank (feet)	240L x 65W	250L x 125W
Average Water Depth (feet)	10	10
Total Surface Area (square feet)	125,000	125,000
Total Volume (cubic feet) (MG)	1,250,000 9.35	1,250,000 9.35
Surface Loading (gal/sq ft/ day)	1,200	800
Displacement - Hours	1.5	2.25
Wier Length (feet)	3,360	758
S.S. Loading - lbs/day (Annuual Average) Percent Removed lbs/day Removed	306,0000 25 76,000	204,000 30 61,000

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- Rehabilitation is cost-effective in that some components of the facility are salvageable, thus conserving potential sunk funds monies in the Rehabilitation Funds.

In general, it was determined by PWD that the rehabilitation of the primary clarifiers was the most effective way of maintaining the treatment capacity and effluent quality of the NEWPCP.

Notice-to-proceed was given on December 27, 1990, with a scheduled length of construction of 1365 days. Furthermore, the construction is staged with only two clarifiers under rehabilitation at a time to provide adequate hydraulic capacity of the treatment train throughout the construction period. The project was initiated for a contracted construction cost of $14,494,768.

PWD continues to seek funding assistance for this project through PennVest. A Letter of Non-Prejudice has been issued by the PaDER for the rehabilitation of the primary clarifiers, which has allowed the project to proceed into the construction stage without jeopardizing this funding option.

As this project consists of rehabilitation of an effective and proven treatment system, as opposed to a new facility, extensive planning was not required for this project. Several standard considerations as a part of funding through the federal Water Pollution Control Revolving Fund (WPCRF), which may be applicable, are addressed herein briefly:

1. Projects must apply best practicable waste treatment technology.

   This project includes the rehabilitation of an existing, proven, and effective system, which is conducive and specifically applicable to this treatment train.

2. Projects must consider utilizing alternative and innovative technologies.

   As this is not a new system, but rather the rehabilitation of a proven facility, innovative and alternative treatment systems would not be applicable.

3. Project's related wastewater collection system must be evaluated and cannot be subject to excessive infiltration and inflow.

   As discussed in Section 2.5.2, extensive SSESs were performed previously for each of three wastewater drainage basins within the City of Philadelphia. PaDER subsequently concurred with the PWD in its determination that elimination or reduction of infiltration and inflow was not cost effective. Furthermore, as previously noted in this report, the flows at the Philadelphia WPCPs are affected more significantly by storm water inflows associated with the combined sewer system than with base infiltration and inflow.

4. Recreation and open space opportunities must be analyzed during the planning of the proposed facility.

   The project does not include the acquisition of new property, and will result in only a minor change in the property's current use. There is no significant opportunity for recreation or open space activities at the NEWPCP.

5. Development of a user charge system and sewer use ordinance.

   The PWD has a well established user charge system and sewer use ordinance for the area to be served by this facility.

6. The project's recommended alternative must be cost effective. Include an analysis that indicates the project's chosen alternative is cost effective.

   Rehabilitation of the existing facility is cost-effective in that some components of the existing facility can be reused, thus preserving potential sunk funds (such as geotechnical investigations, foundations, excavations, site preparation, property acquisition, etc.)

7. An environmental impact assessment must be prepared that describes the project's positive and negative consequences and the mitigative steps taken for unavoidable negative consequences for a variety of environmental systems.

   This project comprises the rehabilitation of an existing facility, such that no environmental impacts than might otherwise already impact the region are expected. The regional environment, specifically the Delaware River, will continue to benefit from this WPCP and its current wastewater treatment capability. Furthermore, the project provides assurance of continued protection of the City's surface waters. Temporary environmental impacts due to construction are currently being mitigated by standard construction techniques including, but not limited to, sediment and erosion control.

8. Davis-Bacon prevailing wage rates must be included in the facility's construction cost estimates.

   The project is already under construction. The costs provided above represent bid prices.

9. Development of a capital financing plan.

   The PWD maintains a capital financing plan for all of its facilities. The latest are summarized most recently in the City of Philadelphia, Water and Sewer Revenue Bonds, Sixteenth Series, dated May 15, 1991.

Furthermore, NEWPCP has been an integral part of all of the past and contemporary regional and City plans to provide adequate wastewater treatment for the Northeast wastewater drainage district. This project only ensures that this facility continues to meet those goals established in other wastewater planning documents and thus is consistent with all other appropriate planning and facility plans.

6.1.2 SEWPCP

6.1.2.1 Process Evaluation

Table 6.1.3 is a process evaluation summary for the SEWPCP that compares the plant's basis of design to PaDER design criteria. As discussed in Section 2.0, the design capacity prior to the last upgrade was based upon 120 mgd. The plant is currently rated at a monthly flow of 112 mgd. As developed in Section 5.1.3, current dry weather flows for this plant over the past three years have averaged 103.5 mgd which is well below the permitted and design capacity. Based upon the existing CSO operations, the following summarizes the SEWPCP hydraulic loading conditions:

SEWPCP	Flows (MGD)		
	Average Monthly	Maximum Day	Peak
Original Design	120	---	---
Design/Permit	112	---	---
Current	103.5*	---	---
Projected 5-year	102.9*	---	---

Note: Current flows based upon 3-year (1989-1991) average
*Denotes dry weather flows

As can be seen, the plant capacity based primarily upon dry weather flows, appears to be satisfactory even for the projected flows.

6.1.2.2 Plant Improvements

Budgeted Improvements

The PWD has forecasted improvements for the SEWPCP that are included in the operating budget for fiscal years up to and including 1996. These budgeted improvements include, for example: mechanical equipment maintenance for the Waste Activated and Primary Sludge Transfer Pumps; sedimentation tank sludge/scum removal equipment replacement with non-metallic chain, flights, wear shoes, and drive sprockets; and general instrumentation/control and

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TABLE 6.1.3

SEWPCP PROCESS EVALUATION SUMMARY

Unit	Number	Dimensions	Existing Capacity	Design Parameter	SEWPCP Design Basis	PADER Guidelines
Mechanical Sewage Screens	6	8.5' channel width 1 inch bar spacing	0.85 ft^3/MG screenings removed	Bar spacing Velocity	1 inch 2.3 FPS maximum	5/8 - 1-3/4 inches 1.25 - 3.0 FPS
Grit Removal	6	10'W x 140'L	3.7 ft^3/MG Grit removal	Velocity	----	1 FPS
Primary Sedimentation	4	250' x 125' x 12' swd	---	Surface settling rate Average Peak BOD removed Wier loading	 960 gpd/ft^2 --- 40% 4,700 gpd/ft	 <1,000 gpd/ft^2 <1,500 gpd/ft^2 30-35% <15,000 gpd/ft
Aeration Tanks	8	210 x 52.5' x 14.3 swd	---	Minimum retention period	1.9 hours	2 hours
				Maximum organic loading	93.5 lbs BOD_5/1000 ft/day	160 lbs BOD_5/1000 ft/day
				FM ratio	---	0.3-1.0 lbs BOD_5/lbs MLVSS/day
				MLSS	4,000 mg/l	3,000 - 5,000 mg/l
				Dissolved oxygen	---	2.0 mg/l
				Return sludge rate	----	15% - 75%

TABLE 6.1.3 (Continued)

Unit	Number	Dimensions	Existing Capacity	Design Parameter	SEWPCP Design Basis	PADER Guidelines
Final Sedimentation Tanks	12	214' x 68' x 11' swd	---	Surface settling rate		
				Average	685-1030 gpd/ft^2	<1,000 gpd/ft^2
				Peak	---	<1,500 gpd/ft^2
				Wier loading	12,700 gpd/ft	<15,000 gpd/ft
				Hydraulic loading		
				Average	---	<800 gpd/ft^2
				Peak	---	<1,200 gpd/ft^2
				Solids loading		
				Average	---	<40 lbs solids/day/ft^2
				Peak	---	<50 lbs solids/day/ft^2
Disinfection	---	Effluent Conduit	---	Contact period		
				Average	37.2 miuutes	30 minutes
				Peak	18.9 minutes	15 minutes
				chlorine dose	8 mg/l	8 mg/l

maintenance equipment necessary to assess the integrity of key process equipment. The following summarizes funding above the Fiscal Year 1993 base budget that has been budgeted for ongoing improvements to the SEWPCP:

BUDGETED IMPROVEMENTS COSTS	FISCAL YEAR		
	1994	1995	1996
	$162,000	$240,500	$185,500

Non-Budgeted Improvements

A partial listing of key items which have been identified by the PWD in need of improvement at the SEWPCP that are recommended for a future budget are summarized in the following paragraphs. An indication of the rational for such improvements and the suggested fiscal year in which the improvement should be implemented are also provided:

- Grit transporters and piping [ASAP] — The two grit transporters and the grit conveyance piping need to be replaced. This job is of an emergency nature.

- Process Air Blowers #1 and #3 [FY 93] — Two Sutorbilt process air blowers need to be rebuilt.

- Influent Pumps [FY 93] — Five influent pump motors and two variable speed drives need to be maintained and have the bearings replaced.

- Maintenance Group Building [FY 94] — A new steel fabricated building is needed to house the Building Maintenance Group.

- Outdoor Switchgear Ventilation [FY 94] — The outdoor switchgear for the incoming power must have a ventilation system and temperature control system installed.

- Flocculation Tank Repair [FY 95] — The concrete channels on the flocculation tanks require repairs and the stop logs should be replaced with sluice gates.

- Replacement of Chlorination Equipment [FY 96] — The chlorinators, evaporators, instrumentation, and piping in the southeast chlorination room of the effluent pumping station are in need of repairs.

- Oregon Avenue CSO Level Sensors [FY 93] — To prevent combined sewer overflows, a level sensor must be installed in the Oregon Avenue combined sewer overflow discharge line. The sensor must transmit information to the SE

Process Computer and the Influent Pumping Station Operation Control Station.

- Pumping Station Diversion Channel Influent Sampling Station [FY 95] — A new influent sampling station is required on the pumping station diversion channel.

- Replace JYC 5000 Process Computer [FY 96] — The JYC 5000 process computer is obsolete. It needs to be replaced with a modern PC-based system.

More stringent discharge limitations or other regulatory requirements that may be instituted in the future could require the installation of additional treatment facilities that have not been forecasted in the Capital Budget Program. Some potential Capital Improvement requirements are summarized below:

- Nutrient Removal — A requirement to remove phosphorus and/or nitrogen from the plant effluent may require the installation of additional treatment processes and require investigation into the best means of removal.

- Dechlorination — A requirement to remove the free chlorine from the effluent after disinfection could require the installation of additional treatment facilities.

6.1.3 SWWPCP

6.1.3.1 Process Evaluation

Table 6.1.4 is a process evaluation summary for the SWWPCP that compares the plant's basis of design to PaDER design criteria. As discussed in Section 2.5, the design capacity prior to the last upgrade was based upon 210 mgd. The plant is currently rated at a monthly flow of 200 mgd. As developed in Section 5.0, current dry weather flows for this plant over the past 3 years have averaged 169.5 mgd, which is well below the permitted and design capacity. Based upon the existing CSO operations, the following summarizes the SWWPCP loading conditions:

SWWPCP	FLOWS (MGD) Average Monthly	Maximum Day	Peak
Original Design	210	300	400
Design Permit	200		
Current	169.5*		
Projected 5-year	190.7*		

Note: Current flows based on 3-year (1989-1991) average
*Denotes dry weather flows

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TABLE 6.1.4

SWWPCP PROCESS EVALUATION SUMMARY

Unit	Number	Dimensions	Existing Capacity	Design Parameter	SWWPCP Design Basis	PADER Guidelines
Mechanical Bar Screens	6	6' channel width	570 MGD	Bar spacing Maximum velocity	1 inch 3.2 FPS	5/8 - 1-3/4 inches 1.25 - 3.0 FPS
Grit Removal	4	60' x 60'	5.20 ft^3/MG	Velocity	----	1 FPS
Primary Sedimentation	5	250' x 125' x 12' swd	210 MGD	Surface settling rate Average Peak BOD removed Wier loading	 1,350 gpd/ft^2 --- 25% 45,700 gpd/ft	 <1,000 gpd/ft^2 <15,000 gpd/ft 30-35% <15,000 gpd/ft
Aeration Tanks	10	14,500 ft^2 x 16' swd	210 MGD	Minimum retention period	1.96 hours (wastewater flow)	2 hours
				Maximum organic loading	106 lbs BOD_5/1000 ft/day	160 lbs BOD_5/1000 ft/day
				FM ratio	0.45 lbs BOD_5/lbs MLVSS/day	0.3-1.0 lbs BOD_5/lbs MLVSS/day
				MLSS	4,900 mg/l	3,000 - 5,000 mg/l
				Dissolved oxygen	---	2.0 mg/l
				Return sludge rate	---	15% - 75%

TABLE 6.1.4 (Continued)

Unit	Number	Dimensions	Existing Capacity	Design Parameter	SWWPCP Design Basis	PADER Guidelines
Final Sedimentation Tanks	20	76' x 260' x 11' swd	210 MGD	Surface settling rate		
				Average	530-795 gpd/ft	<1,000 gpd/ft^2
				Peak	---	<1,500 gpd/ft^2
				Wier loading	12,800 gpd/ft	<15,000 gpd/ft
				Hydraulic loading		
				Average	---	<800 gpd/ft^2
				Peak	---	<1,200 gpd/ft^2
				Solids loading		
				Average	---	<40 lbs solids/day/ft^2
				Peak	---	<50 lbs solids/day/ft^2
Disinfection				Contact period		
				Average	32.8 minutes	30 minutes
				Peak	24.5 minutes	15 minutes
				chlorine dose	8 mg/l	8 mg/l
Sludge Thickening	8	18' x 70' x 8' swd		Solids loading	17 lbs/day/ft^2	20 lbs/day/ft^2
				Hydraulic loading	---	0.8 gpm/ft^2
Sludge Digesters	12	110' diameter x 30' swd	373,000 lbs/day	Side water depth	30'	>20'
				Volatile solids loading	88 lbs VSS/1,000 cf/day	<100 lbs VSS/1,000 cf/day

As can be seen, the plant capacity based primary upon dry weather flows, appears to be satisfactory even for the projected flows.

6.1.3.2 Plant Improvements

Budgeted Improvements

The PWD has forecasted improvements for the SWWPCP that are included in the projected operating budgets for fiscal years up to and including 1996. The budgeted improvements include, for example: mechanical equipment maintenance such as for effluent pumps, main plant air compressors, sludge gas compressors, bar screens, influent screw pumps, cryogenic plant, scum pumps; replacement of equipment that has served out its useful life, such as sludge pumps, boilers, primary tank pumps and valving, controls for ash handling system, and VFD's for miscellaneous pump controls; primary tank overhaul, including flights, chains, wear shoes, sprockets, etc.; grit incinerator overhaul; rehabilitation of scum pumping station, digester mixing system, and heating system; miscellaneous spare parts and equipment purchase; and many other elements.

Not included in this list are several major projects consisting of lagoon closure and engineering for possible future treatment requirements. The following summarizes funding above the Fiscal Year 1993 base budget that has been budgeted for ongoing improvements to the SWWPCP:

	FISCAL YEAR		
	1994	**1995**	**1996**
BUDGETED IMPROVEMENT COSTS	$7,770,000	$5,167,000	$1,875,000

Non-Budgeted Improvements

Frequently, improvements to equipment or facilities cannot be forecasted or the implementation of an improvement may have been held over from previous years. A partial list of items have been identified that should be added to the projected budget are summarized below:

Project
Replacement of Chlorine Pipeline
DAF polymer system
Install high capacity Waste Sludge Pumps
Digester Mixing Rehab
New roofing on South Digesters
Install VFDs for DSPs #2 & #3
Raise flights on influent end of tanks
Upgrade Grit-Handling System - Incinerator Bypass System
Rehabilitation of Heating Equipment
Rehab 70th & Dicks Gates
Lagoon Closure
Purchase hardware/software for CMMS
Plant Water Pump Overhaul
Influent Sampling and Metering
Rehab Scum Pumping Station
Waste Gas Overhauls
Install Sludge Thickening Equipment - RST
Conversion of Dig. Tanks #1 & 2 to Sludge Storage Tanks
Upgrading of UNOX Reactor Purge System & LOX

In addition, more stringent discharge limitations or regulatory requirements that may be instituted in the future could require the installation of new treatment facilities that have not been forecasted in the Capital Budget Program. Some potential Capital Improvement requirements are summarized below:

- Nutrient Removal - A requirement to remove phosphorus and/or nitrogen from the plant effluent may require the installation of additional treatment processes and require investigation into the best means of removal.

- Dechlorination - A requirement to remove free chlorine from the effluent after disinfection could require the installation of additional treatment facilities.

- Lagoons - Several lagoons were used in the past for sludge storage/disposal. Closure of these lagoons may be required in the near future. Closure activities could vary potentially from providing security and performing groundwater sampling to removing the lagoons and remediating groundwater in the vicinity.

6.1.3.3 Consent Order Program - SWWPCP

The EPA and PaDER have taken legal action against the PWD under the Clean Water Act, in response to violations in the late 1980's of the NPDES permit issued to the SWWPCP. The terms of settlement under this action include a specific, sequential, program for corrective actions, intended to ensure consistent long-term compliance with the NPDES permit. A report conducted by an independent consultant was proposed and subsequently issued as a final report on July 8, 1991. This section of the Act 537 Plan will summarize the findings of that report and

outline the corrective measures required over the course of the next several years. These are binding obligations on the SWWPCP.

In summary, there are three areas that have been developed in the consultant's report:

- Remedial Action Plan
- Staffing Plan
- Maintenance Management System

Remedial Action Plan

The Remedial Action Plan (RAP) of the July 8, 1991 Report revised the PWD's 1988 Remedial Action Plan by incorporating additional corrective actions and schedules. A brief summary of this RAP is as follows:

- A LABOR RELATIONS binding recommendation that the PWD retain a labor/management consultant to identify plans and impacts

- NPDES sampling QA/QC, chain-of-custody, and NPDES reporting protocol binding recommendations that serve to ensure the integrity of the sampling, analysis, and DMR reporting programs for the SWWPCP

- Augmentation of the PWD's Septage Haul Program through binding recommendations, including requirements for a new septage receiving facility at the SWWPCP and septage management plan, including haulers' manifests and laboratory analysis of septage

- A Process Control Plan binding recommendation that requires SWWPCP established performance criteria, process control parameters and strategies, standard operating procedures (SOPs), process sampling and laboratory analyses, and process performance monitoring for each major unit process in the plant

- Remedial Action binding recommendations to ensure that the SWWPCP meets its NPDES discharge requirements for each of the following six critical unit processes:

    - waste sludge system
    - SPDC dewatering
    - cryogenic oxygen plant
    - return activated sludge pumping system
    - dissolved air flotation thickening
    - anaerobic digester cleaning

In addition, there were numerous binding recommendations made in the area of process control.

- A Process Equipment binding recommendation to manage and ensure that, throughout the plant, certain major pieces of equipment are always in-service with adequate reserve equipment available.

Staffing Plan

The Staffing Plan as outlined in this report included the following corrective actions:

- A recommendation that the existing maintenance organization be reorganized to consolidate existing staff under a single Maintenance Manager and to organize the unit in functional areas
- Staff the SWWPCP by filling vacancies
- An Operations and Maintenance Training binding recommendation that calls for immediate training in specific areas of management, skilled trades, and operations; determination of the skills and educational requirements for various positions; and an overall long-term program for both remedial and ongoing training
- A recommendation for a full-time industrial safety professional who is to develop, implement, and administer a plant-specific safety program

Maintenance Management System

Finally, the third area addressed in this report is that of Maintenance Management. The recommendation is for an evaluation of the existing maintenance programs and modifications to ensure improved maintenance productivity and reduced equipment breakdowns.

6.2 WASTEWATER COLLECTION SYSTEM - 5-YEAR NEEDS

The Planning and Research Group within the PWD is responsible for evaluating the collection system, determining improvements, and establishing priorities for improvements to be undertaken. Needs are established through maintenance and inspection reports, resident complaints, and internal review and evaluation. Alternative solutions are developed and evaluated within the Planning and Research Group and the most effective and economical alternative is either forwarded to the PWD Design Group or contracted out to a consulting engineering firm for implementation. The planned improvements are cataloged and prioritized to establish a budget in any given year.

6.2.1 Gravity Sewers

The Water Department has budgeted $13.5 million per year for the 5-year period from 1992 to 1996 for the reconstruction of the collection system. An additional $100,000 has been budgeted for the construction of new sewer lines. The projects to be completed over the next several years are included in the Planning and Research Group's Capital Improvements Plan (CIP). At this point in time, the CIP includes 185 projects involving sewer line reconstruction either solely or in conjunction with a water line project. Projects with an estimated construction cost over $500,000 are listed in Table 6.2.1

The CIP is only established for the next 5-year period; therefore, the projects budgeted for Fiscal Year 1996 also include those projects that will be rescheduled for implementation after 1996.

It is important to note that many projects also include water line rehabilitation since the SSES studies pointed to water main leakage as one of the significant sources of I/I.

6.2.2 Pumping Stations

As mentioned in Section 4.2, the pumping stations undergo a regular maintenance regimen that includes periodic, comprehensive overhauls. The Central Schuylkill Pumping Station, by far the largest station in the City, is slated for a complete overhaul, including the replacement of the motors and electrical work. This work has been estimated at $4 million and was to be competitively bid in autumn of 1992. Due to the expense of this rehabilitation effort, this is the only major project scheduled by the Wastewater Pumping Station Group through 1996.

6.2.3 Combined Sewer System

As discussed in Section 4.2, the PWD recently completed a series of contracts to automate eight and monitor 45 regulators in the Northeast Drainage District.

The draft NPDES permit (currently under negotiations with PADER) issued for the Northeast Water Pollution Control Plant provides a detailed survey of the combined sewer control that may be mandated for the PWD over the next five years. As noted in the following section, the state strategy on combined sewer overflows (CSOs) is intended to provide for stricter regulation over the next two permit periods. However, the pending NPDES permit, as with the existing permit, will allow combined sewer overflows only when the hydraulic capacity of the conveyance or treatment facilities are exceeded. Dry weather overflows are prohibited.

At a minimum, best management practices and other non-capital intensive measures to minimize the impact on the receiving water will be required: PADER has outlined program requirements for the Philadelphia system which will develop and implement a CSO program for all CSO discharges in each of the three WPCPs. These program requirements include:

BCM

TABLE 6.2.1

PLANNING AND RESEARCH COLLECTION SYSTEM CAPITAL IMPROVEMENTS PLAN 1992 - 1996 (PROJECTS OVER $500,000 ONLY)

Location	Water	Sewer
Budget Year 1993		
48th - Wyalusing to Lancaster	•	•
Lehigh - Aramingo to Trenton	•	•
Total Major Sewer Projects 1993		**$1,311,900**
Budget Year 1994		
York - Mascher to 2nd	•	•
Dobson's Run Wissahickon to Stokely		•
Total Major Sewer Projects 1994		**$4,843,100**
Budget Year 1995		
Beaumont - 57th and 58th		•
Allegheny - Jasper to Emerald		
24th - Huntington to Lehigh		•
52nd - Paschall to Grays		•
Total Major Sewer Projects 1995		**$7,171,200**
Budget Year 1996 and Beyond		
Wolf - Delaware to 2nd	•	•
Wolf - 3rd to 6th	•	•
Walnut - 3rd to 4th	•	•

BCM

Table 6.2.1 (Continued)

Location	Water	Sewer
Mantua Tunnel		
Zoological to Mantua	•	•
Shedwick to 35th	•	•
Sedgwick - Lincoln to Cresheim	•	•
Shunk - 18th to 19th	•	•
Belfield - Wister to Penn		•
Ogontz - Somerville to Olney		•
21st - Somerset to Indiana		•
Ogontz - Olney to Church		•
Dobson's Run - Roberts to Kelly		•
Juniata - Reading R.R. to 250 N. Dobson		•
Paul's Run - Norwalk to Welsh		•
21st - Sedgley to Somerset		•
Torresdale - Adams to Church		•
Mill Creek - Lancaster to Monticello		•
Monticello - Wilton to 53rd		•
Lancaster - 52nd to 52nd		•
Princeton - Keystone to State		•
Total Major Sewer Project 1996 and Beyond		**$68,596,400**

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Minimum Technology-based Control Measures - Plan of Action - Philadelphia will be required to submit, obtain State and Federal approval, and begin to implement, and evaluate a Minimum Technology-based Limitation Plan of Action within 38 to 52 months of reissuance of its NPDES permit. This Minimum Technology-based Limitation Plan of Action will include as a minimum the following measures:

Identification at each of the regulator facilities:

- Latitude and longitude of each discharge point
- Narrative description of the location of each outfall with respect to a street intersection location map
- Description of the size and type of regulator mechanism, including an engineering drawing
- Description of the size and type of outfall structure
- Vertification of the presence or absence of a backwater flow prevention device in each regulator
- Name of the receiving water
- Development of a visual identification system on all outfalls
- Identification of continuous or chronic dry weather overflows

System Inventory - This plan shall identify all overflow points, control structures, sewer sizes, control structure dimensions, industrial contributors, and key hydraulic monitoring control points. This inventory is required to include system maps, hydraulic analyses, and flow measurements. Also required is characterization of all overflows in terms of both frequency, quantity and quality, and identification of the intensity and duration of the storm event that triggers an overflow. In addition, a determination is necessary for the volume discharged from each overflow for various size storms, number of events, and total volume discharged per year based on historical rainfall records.

Operational Status and Assessment - This requirement includes the physical inspection of each of the CSO regulators and an engineering evaluation with respect to the adequacy and functionality of each. This effort will result in a report recommending remedial measures to bring each regulator up to optimal functionality with the goal to eliminate all dry weather overflows.

Inspection and Maintenance - The development of a written Operations and Maintenance Plan to ensure that:

- deposition of solids do not cause obstructions that will result in overflows
- continuous dry weather discharges are not occurring
- regulators are in good working order and adjusted to minimize overflows

High Flow Management - Development of a High Flow Management Plan with the two following two goals:

- maximization of storage capacity of the collection system without causing surcharging or backups

- maximization of the amount of flow to the treatment plants without upsetting normal plant operations

Ordinance Revisions - Modification to the sewer use ordinance to ensure the prohibitions of:

- dry weather overflows
- construction of new combined sewers, except where sewer separation is not feasible
- inflow sources in the wastewater collection system
- dumping of motor oil and excessive grease into the collection system

Source Reduction - Initiation of a program to minimize the discharge of solids and floating material by:

- regular cleaning of the streets and catch basins
- installation of screens in the CSO regulators
- reduction of infiltration and inflow where feasible

Pretreatment Program - Review of the Industrial Pretreatment Program to ensure CSO impacts are minimized.

Minimization of CSOs Near Sensitive Areas - Examine the elimination or minimization of CSO discharges near drinking water intakes, recreational areas, or unique ecological habitats.

Water Quality Impacts and Plan of Action - PWD will be required to prepare a water quality impact plan in response to those findings of the Delaware River Basin Commission (DRBC) CSO Comprehensive Study of the Delaware Estuary, currently being prepared. This plan will be required within 12 months from the completion of the DRBC study.

Report Requirements - PWD will be required to submit to PaDER and EPA, a semi-annual report of the following subjects:

- Development and Implementation of the Minimum Technology-based Control Measures Plan of Action
- Development of the Water Quality Plan

Furthermore, PWD will be required to submit additional information germane to the CSO system in the annual Chapter 94 - Wasteload Management Report:

- Compilation of monthly monitoring reports of priority CSO overflow points
- Summary of the frequency, duration, and volume of the CSOs for the previous calendar year
- Operational status of major overflow points and identification of known/potential instream water quality impacts and their causes
- Actions taken in implementing the approved Plan of Action

These permitted requirements will represent a major effort on the part of PWD to maximize the effectiveness of its CSO system. It also indicates the prioritization of CSO control on the part of the regulating agencies that is sure to become more intense in the future.

6.3 SLUDGE MANAGEMENT SYSTEMS - 5-YEAR NEEDS

This section of the 537 Plan address the needs of the Philadelphia Sludge Processing and Distribution Center (SPDC) through the next five years.

As a prelude to the discussion, below it is important to note that currently digested biosolids are not achieving the centrifuge feed solids concentrations necessary to maximize biosolids cake production. An increase in feed solids concentration by optimizing any of the steps in the biosolids processing train could significantly improve plant performance through increased operating throughput and save the City of Philadelphia operations costs associated with biannual handling, equipment use, and landfilling tipping fees.

6.3.1 Upgrade of Dewatering Equipment

The most pressing need for the SPDC is to raise the solids concentration in the biosolids cake produced. The increase in cake solids would reduce the volume of material to be composted and cut down on the amount of time necessary for compost processing and the area necessary for composting and curing. The current Bird centrifuges are outfitted with eddy-current backdrives that have been proven to be less than efficient at SPDC. Other facilities using the same equipment

have had similar problems. A dewatering evaluation is necessary to see if existing equipment can be retro-fitted (with mechanical backdrives) with any success or if the outright purchase of high solids machines (such as the Humboldt Hydropress) would be more economical.

6.3.2 Assess the Impact of New 40 CFR Part 503

40 CFR Part 503 was signed November 25, 1992, and will be published in the *Federal Register* in the first quarter of 1993. These new regulations will impact the potential end uses of biosolids and biosolids products (compost). An assessment of the impact these regulations will have on the SPDC is necessary to determine any changes on the processing needs and end uses of biosolids. This assessment must gather additional data on pathogens, volatile solids reduction, certain elements in end products, and process performance. Also additional input from EPA is needed on implementation of the Rule.

6.3.3 Meet Market Demands

Capacity studies on compost processing, screening, storage and on biosolids processing storage and utilization is needed to determine the optimum means of meeting market demands.

6.3.4 Digester Performance

Some questions persist as to the digester performance and subsequent partially digested biosolids being sent to the SPDC for processing by the three WPCPs. This puts more pressure on the equipment since partially digested biosolids have more volume, a higher percentage of oxygen consuming organisms, and are responsible for greater odor potential. Volatile solids are not reduced to any great extent in poorly digested biosolids and may result in problems meeting new Part 503 requirements.

6.3.5 Grit Removal

Grit removal is inefficient and excess grit is causing the bowl and scroll assemblies in the centrifuges to require complete rehabilitation (costing $50,000) every two years. Excess grit also adds volume to the biosolids being processed. An evaluation of the grit removal processes at the WPCPs is needed to eliminate grit from the biosolids stream.

6.3.6 Evaluate Contract Operations

The potential for contract operations should be evaluated. The process control operation manager has made several man hour evaluations of current work practices. Along these lines, a need for specific production goals has been identified. A study on this subject could set standards for the SPDC as a whole and may serve to identify problem areas or establish quality control procedures.

6.3.7 Storage Evaluation

Liquid storage at SPDC could provide flexibility in biosolids processing. A study evaluating the need for additional storage locations and life cycle costing is recommended.

6.3.8 Market Study

Due to the current economic situation in the Philadelphia area, the City should re-evaluate biosolids marketing. The cost of fertilizers has been increasing and this should make the substitution of compost or other biosolids products an attractive alternative. Conversely, competition from other compost generators could limit marketability and/or revenues. Studies on all end uses and their respective financial burdens to the City should be examined.

6.3.9 Agricultural Use Study

Another need is a study on the potential quantities of liquid or cake that can be utilized through site-specific agricultural permitting. The purpose of such a study is to maximize the use of those lower cost biosolids management alternatives.

One of the problems facing the City of Philadelphia concerning land application of its biosolids products is the PaDER land application permitting process. It is possible that PaDER will revise the regulations to allow for general permits to land apply the biosolids in a manner that makes beneficial use easier with less "red tape" involved for the City, contractors, and end users. A proactive approach should be taken to pending changes in PaDER rules, guidelines, and policy. This can be facilitated through participation in Professional Associations and communications with respective PaDER and environmental interest groups, legislators, and regulators in New York, New Jersey, Delaware, and Maryland. The City should proceed into educating these groups and bringing to light the problems of past regulations and policy. It is extremely important to implement guidelines immediately as many states will be modifying their policies and regulations in response to EPA regulations. This is probably the City's last opportunity to significantly influence rulemakers for the coming decade.

6.3.10 Water Treatment Residuals

A portion of the City's potable water treatment residuals are currently being processed at the SPDC. An economic analysis should be performed to determine if this is the most cost-effective management option, considering effects of these residuals on the WPCP and SPDC operations.

6.3.11 Composting Operations

General

An evaluation of the current instrumentation and monitoring scenarios in place at the SPDC is needed. This should include spare parts and availability, new instrumentation on the market,

maintenance on existing instrumentation, appropriateness of monitoring locations, and compliance with new EPA Regulations.

Pathogen Reduction Requirements

All biosolids products that are given away or marketed for use in public access sites, i.e., earthlife sales, give away bins, non-profit organizations, ballfields, city parks, state parks, etc., must meet Class A pathogen reduction. This requires monthly monitoring for Fecal Coliform or *Salmonella* and time/temperature recordkeeping.

Changes in composting procedures should be instituted to:

A. Ensure all of the composting mass achieves the time/temperature requirements

B. Take accurate time temperature measurements

C. Avoid regrowth by segregating Class A and Class B compost handling equipment

D. Apply a blanket of woodchips or finished compost on active compost windrows to improve pathogen reduction.

The utilization of non-composted products, such as liquid biosolids, dewatered biosolids, and mine mix, will be less restricted if Class B pathogen reduction is achieved. No data is available at this time to determine if the fecal coliform limit of 2,000,000 MPN per gram limit is met through digestion alone. If this limit is not achieved consistently, then an evaluation of the anaerobic digester process at the Southwest and Northeast WPCPs should be undertaken.

Vector Attraction Reduction

For compost products that are utilized on a lawn or home garden and distributed in bulk or in bags, the average temperature must be maintained between 45°C and 60°C for 14 days or longer to achieve vector attraction reduction. It is believed SPDC can achieve this if operations are modified to:

1. Cover the compost windrows with finished compost or recycled woodchips

2. Install an automated temperature monitoring system to document temperatures and control blowers.

For non-composted products, vector attraction reduction can be achieved through one of the following:

A. Injecting liquid biosolids beneath the soil surface

B. Incorporation of the biosolids into the soil within six hours of land application

C. Reduction of volatile solids by 38 percent in anaerobic digesters

D. Using laboratory procedures to show that volatile solids cannot be reduced by more than 17 percent over 40 days at temperatures between 30 and 37 degrees Celsius

6.3.12 Future Sludge Quality and Quantity

In the future, new NPDES permit limits may be added by in Delaware River Basin Commission (DRBC), including nitrogen and phosphorous limits on WWTP effluent. This possible permit addition may require some form of tertiary treatment. A preliminary evaluation of the impact of tertiary treatment at the various WPCFs and the impact on the biosolids quality and quantity produced may be needed in the next 5 years.

6.3.13 Develop a Memorandum of Agreement MOA

In order to expand the land application program to contiguous states, PWD should develop a Memorandum of Agreement (MOA) with the state of Delaware and its regulatory agency (DNREC) similar to the MOA PWD has with the Camden County Municipal Utilities Authority (CCMUA). This would better enable the City to utilize biosolids in this nearby agricultural state.

6.3.14 Rail Transportation Evaluation

New bladder containers are available for hauling biosolids by rail and a rail siding at SPDC could increase opportunities to utilize biosolids at remote locations. From the information available, these bladders are reusable and appear to be a viable alternative to trucking. A more detailed analysis should be undertaken.

6.3.15 Current Sludge Quality

From a review of analytical data of Philadelphia biosolids products, it appears that the only metal that occasionally exceeds the concentrations shown in Table 1 is lead. Although this would not limit SPDC's ability to produce marketable material or material for home use, limitations on the amount applied could make marketing more difficult. It is also possible that PaDER will revise its guidelines to similarly limit lead concentrations in agriculture and reclamation. In order to avoid exceedances, Philadelphia should first re-evaluate its local limits with respect to lead. If this does not reveal any significant point source contributers (including water filtration plant direct discharges), then the impact of the Lead and Copper Rule (drinking water corrosion control) should be evaluated. It is possible, but not highly probable, that the problem could be corrected through improved corrosion control.

Monitoring of metals of concern must be conducted on a monthly basis. Selenium, molybdenum, and arsenic are the only elements that must be added to the monthly monitoring list.

6.4 TWENTY-YEAR NEEDS (LONG-TERM)

The Act 537 regulations mandate that all 5-year needs be identified and evaluated, and that long-term (20-year planning period) projections be made. Generally, such long-term planning is prudent to justify any capital facility requirements and the financing period thereof. In the case of this City of Philadelphia Act 537 Plan, the major planning is ongoing and budgeted by the PWD and an integral part of the existing rate structure; long-term planning, to the extent that new facilities are to be defined, is not a part of this scope of work. However, given the projected population, flows, and loadings provided in Section 5 and the evaluation of needs in Section 6, it is apparent that there are no significant long-term facilities required of either the collection system or treatment facilities in view of the projections for declining wastewater needs under dry weather conditions. Indeed the WPCPs have reasonable reserve capacity for the 20-year period under dry weather conditions.

This report will indicate that the focus for sewerage needs in the future will revolve around the wet weather treatment requirements, in particular the CSO and SWWPCP Consent Order issues, and other regulatory requirements that may impact the system.

As an overview of pending legislation or regulations, the following sections of the Act 537 Plan will briefly discuss the following:

- CSO Strategies and Regulations
- Pretreatment Regulations
- Clean Air Act
- Storm Water NPDES Permitting and
- Biosolids Part 503 Regulations

Based primarily on the following regulations and PADER or DRBC mandates, future facility needs can only be evaluated in the context of further studies. Such studies are outlined in the following Section 7.2.

6.4.1 Combined Sewer Overflow Control Regulations and Strategy (Bibliography Reference)

6.4.1.1 Application of CWA to CSOs

The National Pollutant Discharge Elimination System (NPDES) permit program, established by Congress under the Clean Water Act (CWA) in 1972, controls point source discharges of pollutants into waters of the United States. As specified within the CWA, EPA has traditionally issued individual permits to regulate point-source discharges of pollutants from individual facilities. In addition, discharges from separate storm sewer systems are regulated under Section 402(p) of the CWA, and EPA is implementing regulations under this section to develop

systemwide municipal storm water management programs to reduce pollutants from municipal storm sewers.

Effluents from combined systems are not specifically regulated under the standards for sanitary systems nor under the requirements for discharges from separate storm sewers. NPDES regulations, however, provide for the issuance of general permits and the use of individual control strategies to regulate a category or subcategory of point source discharges warranting similar pollution control measures. Thus, locations of CSOs are documented in NPDES permits for publicly owned treatment works (POTW).

6.4.1.2 National CSO Control Strategy

In September 1989 EPA issued a National Combined Sewer Overflow Control Strategy designed to control all CSO effluents. This strategy was designed to compliment control programs for sanitary sewers and separate storm waters by establishing a nationally consistent and uniform approach to develop and issue NPDES permits for CSOs. These NPDES permits are to be issued expeditiously to minimize potential environmental and human-health impacts by establishing technology-based and water quality-based requirements for CSOs.

The 1989 National CSO Control Strategy has three objectives:

1. To ensure that if CSO discharges occur, they are only as a result of wet-weather

2. To bring all wet weather CSO discharge points into compliance with the technology-based requirements of the CWA and applicable state water quality standards

3. To minimize water quality, aquatic biota, and human health impacts from wet-weather overflow

The strategy emphasizes that CSO point sources currently discharging without a permit are unlawful and must be permitted or eliminated. Therefore, regions or states were to have developed and implemented approved permitting strategies by March 31, 1990. Under these individual strategies, all communities with combined sewer systems and all CSO points in these systems were to be identified, with steps taken to permit any CSO discharge points not previously permitted. Also, the status of compliance with technology- and water quality-based permit requirements were to be provided for each discharge point.

When permitting CSOs, technology-based permit limits are to be established for best practicable control technology currently available (BPT), best conventional pollutant control technology (BCT), and best available technology economically achievable (BAT) based on best professional judgment (BPJ). It is important to note, however, that CSOs are not subject to the secondary treatment regulations, that are applicable to publicly owned treatment works. It is also important to emphasize that this strategy does not apply to sewer system bypasses (i.e., intentional

diversions of the waste stream from any portion of a treatment facility, which are prohibited unless certain criteria defined in 49 CFR 122.41(m) (4) are satisfied)

Minimum BCT/BAT technology-based limitations required for all CSO permits, based on a BPJ basis [cf. 40 CFR 125.3(d)], should include:

- Proper operation and regular maintenance programs throughout the system
- Maximum use of the collection system for storage
- Review and modification of pretreatment to minimize potential CSO impacts
- Maximum flow delivery to the POTW for treatment
- Prohibition of dry-weather overflows
- Control of solid and floatable materials in CSO discharges

Combined sewer systems and CSOs also can require case-specific examinations to identify additional control measures necessary to remedy particular discharge problems. Drawing from Section 301(b)(1) (C) of the CWA, the Strategy allows that additional permits limits may be used when necessary to comply with state water quality standards. Further drawing from that Section, permittees are allowed to select and use the most cost-effective technology-based control measures to assure compliance with state standards. Alternative technology-based options available to control wet-weather discharges from CSOs include:

- Comprehensive systemwide storm water management programs
- Supplemental pretreatment
- Sewer ordinances
- Local limits program modifications
- Identification and elimination of illegal discharges
- Pollutant-specific limitations
- Compliance schedules
- Flow minimization and hydraulic improvements
- Direct treatment or overflows
- Sewer rehabilitation
- In-line and off-line storage
- Reduction of tidewater intrusion
- Construction of CSO controls within the sewer system or at CSO discharge points
- Sewer separation
- New or modified wastewater treatment facilities
- Monitoring or modeling requirements

Monitoring requirements for wet-weather overflows from CSOs can vary to meet the circumstances of the individual combined sewer system overflow point(s). In all cases, however, monitoring should be cost-effective and it should serve three purposes:

- Document CSO discharge frequencies and their characteristics
- Evaluate actual water quality impacts resulting from CSOs
- Determine compliance with CSO permit requirements

The strategy indicates that discharge monitoring and/or modeling, waste load allocations that address CSO-related hydrological events, and instream surveys are often necessary to assess how CSO discharges may violate technology-based limitations or water quality standards.

This information also often is needed to design corrective actions. In addition, compliance monitoring requirements should be included in all CSO permits, with required data including incidents and magnitudes of individual CSO events and sufficient data to assess compliance with permit limits and state water quality standards.

Finally, in January 1993, the EPA issued a draft guidance document entitled "Combined Sewer Overflow Control Policy."

6.4.1.3 Pennsylvania Combined Sewer Overflow Strategy

In April 1991, the PADER issued a document entitled "Strategy for Controling Combined Sewer Overflows in Pennsylvania." PaDER's overall goal is to bring all existing CSO discharges into compliance with the State water quality standards. Except for emergencies, PaDER does not allow dry weather CSO discharges. No new CSO systems will be permitted.

The implementation of the strategy is through permitting, compliance monitoring, and (where necessary) enforcement. Existing CSO systems are reviewed and permitted over a 5-year period following PaDER's watershed permitting process.

The initial focus of the CSO strategy will be to require each CSO system to develop and submit a plan of action to identify and eliminate and/or control CSOs and related water quality impacts. The plan will include identification and characterization of these discharges, their current status, effectiveness of existing control measures, known or potential effects on the receiving waters, and identification of needed additional structural and/or non-structural controls with an implementation schedule. Upon approval by PaDER, the permittee shall implement the plan in accordance with the approved schedule. At least once every five years, this strategy will be reviewed and updated as necessary.

Reliable data on discharge volume, frequency, duration, and quality are not available for any CSO systems. However, each CSO system has been prioritized as high, medium, or low priority using the best available data. The initial priorities were established using one or more of the following general considerations:

- Documented instream water quality impact or public health hazards
- Discharges to special protection High Quality/Exceptional Value (HQ/EV) waters
- Potential for instream or public health impact
- Proximity to public potable water supply

- Esthetics and other considerations
- Ongoing and/or planned CSO control projects

All PWD discharges are considered a high priority.

At the present time, PaDER requires municipalities to submit CSO and related information during the NPDES permitting process. In municipalities having both the collection sewers and treatment facilities, the CSO information is required in the permit application and reviewed before the NPDES (Part I) permit is issued and/or renewed. The CSO requirements are reviewed every five years.

CSOs are considered point sources and as such are subject to BAT/BPT/BPJ technology-based treatment requirements and compliance with state water quality standards. However, the minimum technology-based requirements are not defined and necessary data for conducting water quality impact evaluations are not available at the present time.

All CSO systems will be required to record and maintain data on flow, frequency, and duration of discharges occurring from the systems. The data should be summarized and submitted annually and/or made available to PaDER earlier upon request. These systems will be required to include a CSO status report in their annual wasteload management Report (Chapter 94) report. As a minimum, the Chapter 94 report should provide current operational status of major overflow points, a summary of the last 12 months of CSO data, known water quality impacts, and actions taken and/or planned to reduce or eliminate the CSO discharges.

In addition to the above general requirement applicable to all CSO systems, high priority CSO systems may be required to perform additional special data collection, monitoring, analysis, and quarterly reporting, as generally outlined in the NPDES permit.

Controlling and/or eliminating the CSOs and their water quality impacts is a ambitious goal and viewed as a long-term program, i.e., over several permitting cycles. As a starting point, a minimum 10 years (two permitting cycles) program will be used to completely implement the CSO strategy. This approach will provide sufficient time to collect and evaluate data to require any cost-intensive control measures.

During the first permitting cycle, each CSO will be required to submit a plan of action and, upon PaDER's approval, begin to implement certain minimum best management practices identified in the plan. The second phase of the CSO implementation will build upon the progress and results of the first phase control practices and activities. This phase may result in additional refinements to the plan of action and where necessary, may result in requiring additional structural and/or non-structural controls.

The only exception to the above two-phase implementation approach will be the high priority systems where the PaDER has documented evidence of significant problems and water body degradation and other areas where existing CSO controls and other improvement programs are already underway or are planned. In the case of the PWD, this determination is presently underway by the DRBC Delaware estuary water quality model.

6.4.2 Future EPA Pretreatment Regulations

In the near future (5- to 10-year horizon) the EPA will be working on several Acts and programs that will effect the Philadelphia Industrial Pretreatment Program. The following represents a synopsis of the most pertinent points from the EPA agenda:

1. New categorical pretreatment guidelines are currently being developed by the EPA. These new guidelines will effect a variety of industries. Other categorical pretreatment standards are being designated for study. A summary of those categories effected and proposed completion dates can be found in Table 6.4.1.

2. In the next 12 to 18 months, NPDES permit applications Short Form A and Standard Form A will be replaced by Form 2A. Form 2A will cover municipal permits and combined sewer overflows (CSO). More specific chemical effluent monitoring requirements are to be proposed and will accompany Form 2A.

3. The long awaited EPA Biosolids Regulation (40 CFR 503) was issued in December 1992. This will affect biosolids management practices and land application (agricultural use, reclamation, horticulture, and landscaping) in general. This is discussed further in the next section.

4. The 33/50 Program is an EPA voluntary industrial program that encompasses 17 pollutants. Goals are 33 percent reduction (in 1992) and 50 percent reduction (in 1995). This is based on the Toxics Release Inventory (TRI) and reporting requirements mandated by the Act.

5. Three major programs that will impact the IPP include the Storm Water Program, Clean Air Act, and the reauthorization of the Clean Water Act.

6. EPA has begun a push to expand industrial user permitting to include commercial and small industrial discharges that do not fall under the Significant Industrial User (SIU) heading.

7. More emphasis is to be placed on toxic organics by EPA. EPA wants to start using Toxic Organic Management Plans (TOMPs).

8. A recent addition to IPPs has been an added emphasis on slug discharges. Sludge Discharge Prevention and Control Plans are now a required item in all IPPs. The IPP is required to evaluate each SIU at least once every two years to determine if a plan to control slug discharges is needed. EPA further recommends that the IPP evaluate all industrial users, including commercial users, for the need for such a plan. Users which have the potential to discharge slugs and may not be considered SIUs include radiator shops,

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TABLE 6.4.1

CATEGORICAL PRETREATMENT STANDARDS GUIDELINES CURRENTLY UNDER DEVELOPMENT

Point Source Category	Proposal Date	Final Action Date
Pesticide Chemicals (Manufacturing)	Published April 1992	July 1993
Pesticide Chemicals (Formulating and Packaging)	January 1994	August 1995
Waste Treatment, Phase 1	April 1994	January 1996
Metal Products and Machinery	November 1994	May 1996
Pharmaceutical Manufacturing	August 1994	February 1996
Organic Chemicals, Plastics and Synthetic Fibers (Remand Issues)	Published December 1991	May 1993
Coastal Oil and Gas Extraction January 1995	July 1996	
Pulp, Paper, and Paperboard	Dates Subject to additional litigation	
Offshore Oil and Gas Extraction	Dates Subject to additional litigation	

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printers, industrial laundries, chemical storage facilities and suppliers, and railroad and truck cleaning facilities.

9. EPA requires periodic revisions to the technically-based local limits analysis, which sets the maximum concentrations for pollutants discharged to the WWTP. Conditions which might require local limits revisions include changes in environmental criteria, availability of additional monitoring data, and changes in plant processes, or capacity or configuration. EPA also wants IPPs to develop local limits for organics and oil and grease (O&G) as an additional requirement.

Although not an EPA pretreatment regulation, the Commonwealth of Pennsylvania recently passed the Publicly Owned Treatment Works Penalty Law or Act 9 (April 25, 1992). Under its provisions the City of Philadelphia, in addition to proceeding under any other act or local ordinance, may proceed to assess a civil penalty against an industrial user. The civil penalty may be as high as $25,000/day for each violation, whether or not the violation was willful or negligent. More importantly, the penalty may be addressed irrespective of jurisdictional boundaries.

Civil penalties collected under this act shall be placed in a restricted account and shall only be used by the City of Philadelphia to repair damage, to pay any additional costs imposed as a result of the violation for which the penalty was imposed, to pay any penalties imposed on the City of Philadelphia by the Federal or State Government for the violation of pretreatment standards, to pay costs incurred to investigate an enforcement action, and to pay for monitoring the discharges and capital improvements to the treatment works. Any remaining funds may be used for capital improvements to the treatment works.

6.4.3 Clean Air Act Amendments of 1990

The 1990 Clean Air Act Amendments (CAAA), signed into law by Congress in October 1990, affect the City in three of the key provisions. These three are Title I - Nonattainment, Title III - Hazardous Air Pollutants, and Title V - Permits.

Title I establishes air pollution requirements in areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, particulate matter, sulfur oxides, nitrogen oxides, and lead. Areas within the United States are classified as marginal, moderate, serious, severe, and extreme. The Delaware Valley is designated severe and must include reasonably available control technology (RACT) on air pollution sources of 25 tons per year of more. The State Implementation Plan (SIP) for the Delaware Valley allows for emission from one source to be increased, if it is offset by decreasing emissions from another source by a factor of 1.3 to 1.0.

Title III of the CAAA provides a list of 189 hazardous air pollutants (HAPs), with a schedule for reduction or elimination of such hazardous pollutants from major source of these pollutants. Large treatment plants - emitting more than 10 tons per year of any hazardous pollutant or 25 tons combined - are defined as a major source. The CAAA call for EPA to set standards for such treatment plants by November 1995. In addition, EPA is to set a threshold for substances known

to cause adverse health or environmental effects, including chlorine and sulfur dioxide. Treatment plants with above-threshold levels will be required to submit risk management plans and comply with the regulations by November 1996.

Title V of CAAA requires states to develop and submit a permit program to EPA by November 1993. Regulated pollutants will include volatile organic compounds (VOCs), hazardous air pollutants, and pollutants specified under the National Ambient Air Quality Standards. The comprehensive permit program will include a compliance plan to describe how the Clean Air Act requirements will be achieved, and annual certification will be required to ensure that the facility is in compliance.

6.4.4 Potential Effect Of Final Rule On Biosolids (40 CFR Part 503) On The Philadelphia Sludge Management Unit

The Final Rule on Biosolids (40 CFR 503) was finalized on November 25, 1992. Based on a review of this rule, the following management practices are affected:

- Sludge Incineration
- Land Application (Agricultural Use, Reclamation, Horticulture, and Landscaping)
- Surface Disposal (sludge - only landfilling, trenching, spreading of sludge in excess of agronomic rates, material stored for more than 2 years).

Incineration is affected to a great degree; however, the City of Philadelphia does not utilize incineration as a sludge management practice.

The land application portion of the Final Rule has the greatest effect on the Philadelphia Sludge Management Unit.

The final Rule sets standards for disinfection, vector attraction reduction, loading rates for nutrients and certain elements (metals or pollutants to EPA), monitoring, recordkeeping and reporting requirements, and acceptable management practices. These standards vary depending on the end use of Biosolids. For example, standards for biosolids used in the home garden are more stringent than for biosolids used in strip-mine reclamation.

The land application of certain elements contained in biosolids is regulated through 4 sets of numbers:

1. A "ceiling limit" for each element that cannot be exceeded in any biosolids that are land applied. EPA has indicated that these numbers will resemble those that are less than 95 percent to 98 percent of sludges sampled in the National Sewage Sludge Survey (NSSS). These values along with existing state limitations are shown in Table 6.4.2. It should be noted that the most

restrictive limitations apply. EPA recommends that the generators plan to meet a concentration 20 percent less than this ceiling in order to assure compliance.

2. Cumulative lifetime loading rate and maximum annual loading rates have been set for each element that cannot be exceeded starting from the day the Final Rule becomes effective. A list of Maximum Lifetime Loading rates is included in Table 6.4.2 Column Nos. 3 and 7.

3. The "No Observable Adverse Effects Level" (NOAEL) Sludge or "Alternate Pollutant Levels" defines maximum concentrations for Biosolids that can be utilized at agronomic rates for 100 years without degrading soils, surface water, groundwater, crops, wildlife, livestock, or human health. The limits for this highest quality biosolids, i.e., suitable for distribution and marketing (D&M) from the September 1992 draft rule are listed in Table 6.4.2 Column 6. These concentrations are used to define Class A biosolids, those that may be sold to homeowners for example.

4. The City of Philadelphia through its Memorandum of Agreement (MOA) with the Camden County Municipal Utilities Authority (CCMUA) and the New Jersey Department of Environmental Protection and Energy (NJDEPE) can land apply its compost product on New Jersey land application sites. However, the New Jersey State laws will still predominate. Currently, Philadelphia is only applying its biosolids as landfill cover in New Jersey. New Jersey biosolids quality criteria for land application is also shown on Table 6.4.2 Column 4. New Jersey has proposed draft modifications to its land application limits from its Science and Technology Section of NJDEPE. However, they were so stringent and inner-department comments so negative that NJDEPE has decided to wait for the final 503 Rule before any modifications are made.

Pathogen and vector attraction reduction requirements will be modified and will have an effect on Philadelphia. The new rule will have similar requirements as in Part 257.

Vector Attraction Reduction

All biosolids that are land applied must meet **one** of the following vector attraction reduction requirements:

- Volatile Solids Remediation of 38 percent or greater (this is calculated across the digestion process). If the anaerobic digesters cannot achieve this, there is a second test for hard to digest sludges. A laboratory digestion that does not further reduce volatile solids by more than 17 percent will demonstrate vector attraction reduction.

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TABLE 6.4.2

LAND APPLICATION CRITERIA OF CERTAIN ELEMENTS IN BIOSOLIDS

1	2	3	4	5	6	7
Element	**EPA Ceiling mg/kg**	**EPA[1] Lifetime Loading kg/ha**	**Current NJ Biosolids Quality Criteria mg/kg**	**PA Ag Use Guideline mg/kg**	**EPA[1] D&M[2] mg/kg**	**EPA[1] Annual Loading Rate kg/ha**
As	54	39	10	NL	39	1.9
Cd	58	39	40	25	39	1.9
Cr	3,000	3,000	1,000	1,000	840	150
Cu	3,300	1,600	1,200	1,000	1,600	80
Pb	630	300	4,800	1,000	300	15
Hg	38	18	10	10	18	0.9
Mo	54	32	NL	NL	32	1.6
Ni	500	500	1,250	200	290	25
Se	250	250	NL	NL	27	12
Zn	5,700	3,200	2,400	2,500	3,200	160
PCB's	NL	NL	NL	10	NL	NL

NL = Not limited

kg/ha - kilogram per hectare

[1]Source - September 3 Draft of 40 CFR Part 503

[2]Biosolids with concentrations less than those shown will not have to comply with recordkeeping on annual or lifetime loading rates. This quality is recommended for those products which are used in Distribution and Marketing (D&M) program used with at sites with high public access.

- Specific Oxygen Uptake Rate > 1.5 mg/hr/gr at 20 percent
- 14 days of aerobic conditions at 45 percent or greater (always 45° - 60° C) (this may be the method by which compost achieves vector attraction reduction)
- pH 12 for 2 hours and pH 11.5 after 22 hours
- ≥75% Total Solids (TS) (With no primary sludge)
- ≥90% TS (With primary sludge)
- Subsurface Injection

Pathogen Reduction

Pathogen Reduction Requirements of Part 503 vary depending on end use of the biosolids. EPA has also set interim performance criteria, until November 23, 1994, during which Process to Further Reduce Pathogens (PFRP) and Process to Significantly Reduce Pathogens (PSRP) definitions are used for Class A and Class B, respectively.

Class A Pathogen Reduction is required if bulk biosolids are applied to a lawn or home garden, or if biosolids are bagged and sold or given away.

Class B Pathogen Reduction is required if bulk biosolids are applied to agricultural land, forests, a public contact site, or a reclamation site.

Class A

The regulations offer six alternatives for meeting Class A criteria, but the easiest for Philadelphia to meet is the existing EPA definition of a PFRP criteria until November 23, 1994 and Alternative 1. Alternative 1 requires:

- Fecal coliform less than 1000 MPN per gram of total solids (TS)
- *Salmonella* sp. less than 3 MPN per 4 grams of total solids (TS)

- Temperatures must be maintained for a specified time, the following equation defines these requirements:

$$D = \frac{131,700.0}{10^{0.1400t}}$$

where D = time in days

and t = temperatures in degrees Celsius

Temperatures and time most likely in static pile compost piles are listed as follows:

50°C	13.17 days
51°C	9.54 days
52°C	8.91 days
53°C	5.01 days
54°C	3.63 days
55°C	2.63 days
56°C	1.90 days
57°C	1.38 days
58°C	1.00 days

If these tests do not demonstrate Class A pathogen reduction, then there are three other combinations of testing and performance criteria which could be used. The frequency of pathogen indicator monitoring for a wastewater treatment plant producing greater than 15,000 metric tons per year is once per month.

Under the current composting practices at the Sludge Processing and Distribution Center (SPDC) it is not likely that Class A Pathogen reduction will be achieved in Philadelphia compost. SPDC will have until November 24, 1994, to come into compliance with the Class A pathogen reduction requirements.

The new regulations will require separate recordkeeping until PaDER modifies its regulations and/or becomes a delegated authority for Pennsylvania sludge programs.

Class B

Sludge and sludge products that are utilized for agriculture, silviculture, reclamation, and in general, sites with little public access, must meet PSRP requirements through November 23, 1994, and EPA new Class B requirements thereafter. There are also best management practices required for sites using Class B material, such as restrictions on the length of time from application to land and harvesting of certain crops, grazing, and public access.

The new Class B status may be achieved for Philadelphia sludge products by demonstrating that the mean density of fecal coliforms is less than 2 million MPN per gram of sludge solids, or less than 2 million Colony Forming Units per gram of sludge solids.

Monitoring must be conducted monthly and a minimum of seven samples must be analyzed. It is not clear at this time if each product must be sampled and analyzed separately, i.e., liquid, cake, mine mix, etc., or if just liquid is sufficient. It is also not clear whether samples must be analyzed if during that month no liquid, cake, or mine mix is land applied.

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7.0 PLAN IMPLEMENTATION AND INSTITUTIONAL EVALUATION

7.1 GENERAL

This section of the Act 537 Plan will provide the information necessary to ensure understanding of the continued development, evaluation, and selection of Plan alternatives for implementation in each of the needs areas, specifically referring to areas such as OLDS, conveyance, treatment, and biosolids handling and disposal. Furthermore, the following information will outline the institutional and financial framework for accomplishing the objectives of the selected Plan.

It is necessary at this point in outlining the selected plan and implementation to comment on the approach utilized in development of this Act 537 Plan, as agreed upon with PADER at the Task Activity Report phase; specifically, the focus of this regional Plan is on the City of Philadelphia and its associated sewerage needs. The Philadelphia Water Department (PWD) provides this essential service for the greater Philadelphia metropolitan area, as has been outlined in this Plan heretofore, in particular Sections 3.2 and 3.3, with the primary planning responsibility beyond the City being with the outlying communities and authorities.

The regional conveyance and treatment system currently in place in Philadelphia is a result of, and consistent with, the planning for large scale regional facilities that was conducted from the 1950s to the mid-1980s. These regional facilities have served the needs of the area well, treating flows from over 2.2 million people in 1990 with a high level of reliability in meeting discharge requirements. This Act 537 will continue with this general planning concept of regional facilities; a few reasons for this approach include, but are not limited to:

- The existence of a current and longstanding institutional and financial framework for facilitating the significant capital investments in existing facilities and the presence of a correspondingly significant infrastructure

- The current trend of declining population and concomitant wastewater capacity needs in the City of Philadelphia.

As outlined in prior sections of this report, the regional Philadelphia facilities currently serve ten outlying authorities and/or municipalities by agreement. Specifically, as mentioned in Section 5 of this Plan, these municipalities/authorities have generally established long-term planning for regional treatment, with many of the parties: 1) having planned for capacity based upon saturation growth, and/or 2) having long-term agreements established, and finally 3) with all parties having sufficient reserve capacity available under their agreements to meet at least their 5-year needs. Furthermore, most parties require that a relatively small percentage of flow be treated at the PWD's WPCPs by comparison; the two largest users are Delaware County Regional Authority (DELCORA) and Bucks County Water and Sewer Authority, both of which are at approximately 80 percent of their allocated capacity and are currently or have recently completed facility planning to manage future flows.

Finally, this section of the Plan will outline not only the recommended plan for the continued operation of the City of Philadelphia's sewerage facilities but will also, in combination with the previous information in Sections 2.4.4. and 3.3, provide that the PWD has the ability to implement the recommended plan. This plan is summarily outlined below, with the institutional and implementation aspects defined more fully.

7.2 SELECTED PLAN

7.2.1 Unsewered Needs Areas

Within the City of Philadelphia, it has been noted that only approximately 0.4 percent of the residents are currently utilizing On-Lot Disposal Systems (OLDS). Areas with the greatest concentration of OLDS have been identified through discussions with Health Department and a search of its files as well as records of the PWD. These area are shown on Figure 4.1-1 of the Plan. At this time, there are no comprehensive plans to provide service to these areas for the following reasons:

1. Most, if not all, of the OLDS locations are provided with public water from the Water Department, thereby eliminating the health threat normally associated with the occurrence of contaminated well water in rural areas.

2. Based upon an extensive search of Health Department records, all areas of concentrated OLDS have less than a 5 percent rate of reported malfunction.

3. Although the soils in these areas generally may be categorized as unsuitable, based upon the predominance of Urban Land geologic formation, individual site inspections often result in the availability of suitable land (larger lots) for replacement systems.

4. The Health Department has a successful program in place to enforce compliance with the State and City regulations governing OLDS.

5. Many of the areas of concentrated OLDS are in areas where public sewers are not readily accessible or would be prohibitively costly to install due to the presence of rock and/or rolling terrain that precludes gravity sewer service studies by which to evaluate such interceptors.

6. The PWD, in association with the Department of Licenses and Inspections, currently regulates septage haulers within the City, requiring such elements as a City license and verifying, through sampling and testing procedures, the general nature of such wastes before acceptance into a PWD WPCP.

7. Furthermore, under the current Consent Order, the SWWPCP will be provided with a new septage receiving and handling facility.

The PWD, in association with the Health Department, currently has a limited policy and procedure for evaluating malfunctions and the ability to provide for sewer extensions into the unsewered areas; there is an annual budgeted line item to accommodate such work.

Furthermore, the PWD, in conjunction with the Health Department will endeavor to:

1. develop a more rigorous evaluation of the actual magnitude of current malfunctions in focused areas

2. prioritize the seven concentrated areas addressed herein to evaluate public health hazard

3. assess the need to implement a more formal sewage management program for the remaining unsewered areas

These efforts will be part of the implementation of this Plan.

7.2.2 Collection and Conveyance System

As discussed in Section 4.2 of this Plan, the collection and conveyance system is approximately 60 percent combined (storm and sanitary) and approximately 40 percent separate sanitary sewers. As discussed, the interceptors in the system have been conservatively designed to handle 110 percent of all theoretical dry weather flows, based upon predicted population densities in each subbasin. Although a hydraulic model of the system exists and an evaluation of it indicates that there are segments of the collector system which are overloaded, these results must be further scrutinized before taking any corrective actions based upon the following:

1. That a review of the population density statistics indicates that the actual density is significantly below the design density

2. That the design criteria were very conservative in that the interceptor capacities were rated on the basis of one half and two thirds full, not on full pipe design

3. That no actual flow data exists, nor is easily determined without actually conducting metering

In practice, the PWD staff evaluate the condition of the system based upon maintenance and repair records, customer records, and other available data. It is on the basis of these evaluations that a Capital Improvements Program (CIP) prioritizes rehabilitation and replacement of collectors and interceptors. Details of the proposed CIP program are provided in Section 6.2 of this Plan. Overall sewer funding, over the next five years, is budgeted as follows:

Fiscal Year	Total Budgeted Sewer (million $)
1993	14.1
1994	13.5
1995	13.5
1996 (and beyond)	13.5

It should be noted that the fiscal year 1996 CIP listing includes all remaining identified projects, which will extend the planning period further.

With regard to the 12 wastewater pumping stations within the City, preliminary investigations indicate that all stations have sufficient rated capacity both for present and future conditions and are generally refurbished on at least a 25-year period. The only scheduled work is refurbishment of the Central Schuylkill Pumping Station.

7.2.3 Combined Sewer Overflows (CSO's)

As discussed in various sections of this Act 537 Plan, the 175 CSOs currently existing in the regional Philadelphia sewerage system have and will continue to be a significant issue relating to the operation of the system. Previous facility plans have conducted evaluations and the development of the Northeast CSO Network has laid the frame-work for the City's current position on the CSOs. Specifically, due to the number of overflows and the magnitude of the existing combined sewer infrastructure, current design and operating strategy rely on a remote monitoring system for forty-five (45) discharges and control of eight selected CSOs to maximum wet weather storage within the combined sewer system and optimize the hydraulic capacity of the sewer and treatment system through such control. Whereas the present system is still somewhat in the development and optimization stage, the automated control to meet all possible regulations is not a part of PWD's plans at this time.

Indeed, the primary emphasis in the planning of any future CSO modifications will be in two areas in particular:

- continued optimization of the eight controllable and forty-five (45) monitored CSOs in the Northeast Drainage District
- particular studies on the CSOs as mandated by the recent EPA and Pennsylvania strategies on CSOs

This latter area has been further outlined in Section 6.2.3 of this Act 537 Plan and will be a condition of the forthcoming NPDES permit for each WPCP. As such, it will require that a plan of action be developed for implementation of best management practices and other noncapital intensive control measures to minimize the impact of CSOs on the receiving waters. In general, the PWD is being required to assess, develop, and implement the following most significant control strategies for CSOs in each of the WPCP service areas:

1. Minimum Technology Based Control Measures, Plan of Action and initiate Implementation within 38 to 52 months of new NPDES permit issuance

2. A High Flow Management Plan to maximize storage in the combined sewer system and flows to be treated at the WPCPs without causing system backups or upsetting the WPCPs' normal plant operations, respectively.

3. Source Reduction Measures, possibly considering, in addition to other measures, screening of CSOs to eliminate the discharge of solids and floating material and also reduction of infiltration and inflow in the separate sewer system

4. Pretreatment Program Review

5. Minimization of CSOs near sensitive areas

6. Water Quality Impact Plan, which will be required to be completed within 12 months of the completion of DRBC's study of the Delaware River.

Other efforts have also been identified by PADER to date, but the above represent the most significant requirements, all of which may result in future modifications to PWD operations and/or facilities.

7.2.4 Water Pollution Control Plants

This Act 537 Plan has developed and projected both current and future (5-year and 20-year) flows and loadings onto the WPCPs. These flows and loadings are based upon a distinction between dry and wet weather conditions, necessitated by consideration of the unique combined sewerage system in the City of Philadelphia. Accordingly, as discussed in Sections 4.3, 5.3, and 6.1 of this Plan, the three WPCPs have all been determined to have both current and future reserve capacity for wastewater flows and loadings. This reserve capacity, which is shown on Table 5.4.2, is based upon dry weather flow conditions and has made allowances for utilization of the maximum contractual allocations from the outlying municipalities. Preliminary population projections for the outlying communities confirm the validity of this assumption, indeed indicating that short-term needs will be conservatively estimated. Current reserve dry weather capacities are 27.0 mgd, 8.5 mgd, and 28.4 mgd for the NEWPCP, SEWPCP, and SWWPCP, respectively. Future reserves drop to estimates of 10.6 mgd, 10.9 mgd, and 8.7 mgd in the year 2010 for the three treatment plants, respectively; this is primarily due to an increase in loadings from the outlying communities

up to the contracted amounts, given the drop in domestic wasteloads anticipated from the City of Philadelphia over this planning period.

Additionally, the PWD has developed and is implementing a 6-year Capital Improvements Program (CIP) to ensure that each WPCP has needed improvements identified, prioritized, and funded to ensure the continued reliable operation of current equipment, and ensure compliance with discharge (regulatory) requirements. This Act 537 Plan has generally outlined both budgeted and nonbudgeted improvements and associated costs through Fiscal Year 1996, the end of the current CIP plan. These improvements are indicated in Sections 6.1.1.2, 6.1.2.2, and 6.1.3.2 for the NEWPCP, SEWPCP, and SWWPCP, respectively. Furthermore, (1) the NEWPCP is currently embarking on a Primary Sedimentation Tank Rehabilitation Program that has been mandated by a Consent Order with PADER and has a letter of Nonprejudice on file with PENNVEST, and (2) the SWWPCP is currently in the midst of a mandated Consent Order improvement program that is described in detail in Section 6.1.3.3 of this Plan.

Finally, the concerns related to present and future loadings at the WPCPs, as influenced by storm and wet weather conditions must be dealt with by the PWD. It is important to understand this problem in the context of the following points:

1. Although the WPCPs are each rated in their NPDES permit on the basis of average monthly flow, this permit parameter is specifically not considered as a violation if and when exceeded.

2. The reason for the above includes the facts that (1) the sewerage systems are uniquely a combined system with both controllable and noncontrollable CSO discharges, and (2) that the ability to treat the wastewater is related not only to the flows but also to the organic and solids loadings, both of which have been shown to be substantially below the design basis.

3. That each WPCP has in its permit, in addition to the monthly average flows, maximum daily and peak flows that are to be considered in order to ensure that no treatment upsets are experienced during storm and/or wet weather conditions.

These wet weather loadings onto the treatment plants are not readily controllable under current plant operations, but they are very much related to the operating policies and physical framework of the CSOs. Indeed the goals involving operations of the conveyance system and CSOs are to ensure not only that the conveyance system storage is maximized but also that the WPCPs are not hydraulically overloaded. Therefore, it is imperative that the hydraulic loadings onto each WPCP be considered in the context of optimizing the CSO issues. Indeed, the detailed investigations that were outlined for the CSOs, specifically the:

- High Flow Management Plan
- Source Reduction Program
- Water Quality Impacts Plan

Should all address, from an overall system management approach, these wet weather and storm-related capacity problems for the WPCPs as well as the conveyance system. It should be noted that, as a part of these studies, there may be a benefit to considering the additional primary treatment capacity at both the NEWPCP and SWWPCP (above the rated capacity) for purposes of possible future bypassing of storm flows which otherwise exceed the plant's capacity.

Additional near-term requirements for the plants include: chlorine minimization studies, sludge handling and thickening optimization, odor control work at NEWPCP, pretreatment program implementation, biomonitoring, and other related operations.

7.2.5 Biosolids Management

The PWD currently has developed a focused approach to handling sludges and biosolids from the three WPCPs. Whereas the primary and secondary sludges are thickened and digested at the NEWPCP and the SWWPCP (which includes SEWPCP sludges), all dewatering is currently handled at the Sludge Processing and Distribution Center (SPDC). Three one million gallon sludge storage tanks at the SPDC receive and hold the sludge which is barged from the NEWPCP and pumped from the SWWPCP. At the SPDC, the biosolids are dewatered in 10 scroll centrifuges and are then composted via static pile composting, described in Section 4.3.4 of this Plan. The disposal of these biosolids has developed into 4 different disposal products: (1) sludge cake for agricultural applications, (2) mine mix, (3) Phillymulch, and (4) Earthlife.

As discussed in Section 6.3, although the framework of biosolids management has been extensively developed over the last decade since the ocean disposal of sludge was abandoned, there are areas in which significant improvement and optimization are needed. The PWD is committed to both maintaining the general processing regimen of current biosolids management as well as improving on these operations and facilities. Accordingly, the following areas have been identified for additional study:

- Improved sludge handling and thickening at the WPCPs
- Upgrade of dewatering equipment to improve effectiveness
- Assessing the impact of Part 503 on biosolids disposal
- Ongoing and focused marketing studies and strategy
- Investigate digester performance
- Improved grit removal
- Potential for contract operations at the SPDC
- Optimize composting operations further

7.3 INSTITUTIONAL AND FINANCIAL EVALUATION

7.3.1 General Institutional

The Philadelphia Water Department (PWD) was established by the Philadelphia Home Rule Charter (previously mentioned in Section 2.4) as one of the ten operating departments of the City. Through the Charter, the Water Department was granted the power and duty to operate, maintain, repair, and improve the City's water and wastewater system. The Charter requires the City Council to establish standards for setting rates and charges for the supplying of water and sewage treatment services. Pursuant to the Charter and the Philadelphia Code of General Ordinances, the Water Department has the authority to fix and regulate water and sewer rates and charges. As a requirement of the City Council's Standards, the Water Department must give written notice to the City Council prior to filing notice of any proposed change in water or sewer rates and submit financial, engineering, or other data upon which the proposed charges are based. The rates and charges are established to yield an amount at least equal to the Water Department's operating expenses. These expenses could include interest and sinking fund charges on the City's obligations in respect to water and wastewater systems and additional amounts as required to comply with rate covenant and sinking fund reserve requirements. Also, proportionate charges for all services performed for the Water Department by all officers, departments, boards, or commissions of the City would be included as operating expenses.

The Charter also authorized the Water Department to enter into contracts for sewer and sewage disposal services to users outside the limits of the City with the authorization of the City Council. As previously discussed, contracts for wastewater treatment services have been established with ten neighboring municipalities and authorities. These contracts provide for quarterly billings based on the operating costs associated with the volume and strength of the wastewater received. Additionally, the municipalities or authorities are either billed quarterly for depreciation and capital payments on allocated wastewater conveyance and treatment facilities or a capital contribution is made to the Water Department for their allocated share of the cost of treatment facilities.

The operations of the Water Department are accounted for in the Water Fund, which is an enterprise fund of the City. The Water Fund is an accounting convention established for the purpose of segregating bond proceeds and project revenues from other funds of the City not held exclusively for Water Department purposes. The Water Fund was established as a requirement of the Sixteenth Supplemental Ordinance and is maintained with the Fiscal Agent for as long as the Sixteenth Series Bonds are outstanding. The Water Department's operating budget is developed annually for the ensuing fiscal year.

The Home Rule Charter requires the City Council to adopt annually, on or prior to May 31, a capital budget for the ensuing fiscal year, and a capital program showing the capital expenditures planned for each of the six ensuing fiscal years. The City Council may change the elements or financial schedule of the Capital Improvements Budgets developed by the operating departments.

Financing for the Water Department's Capital Improvement Program is expected to be funded with the proceeds of debt to be incurred during the six-year planning period. The City expects most of this debt to be in the form of water and sewer revenue bonds. A portion of the debt may also be provided by loans to the City from the Pennsylvania Infrastructure Authority (PENNVEST). The PENNVEST program was established by the Commonwealth to provide low interest cost financing for water and wastewater projects within the Commonwealth.

7.3.2 Financing

7.3.2.1 Current Bond Authorization

The Sixteenth Series Bonds are issued under The First Class City Revenue Bond Act, P.L. 955, Act No. 234 of the General Assembly of the Commonwealth of Pennsylvania, approved October 18, 1972 (the "Act"), and the General Water and Sewer Revenue Bond Ordinance of 1974, as amended and supplemented by the Sixteenth Supplemental Water and Sewer Revenue Bond Ordinance, approved on May 2, 1991.

Under the Act, cities of the first class are authorized to issue revenue bonds to finance revenue-producing projects and to refund certain outstanding bonds, including revenue bonds issued under the Act, but the bonds must be payable directly or indirectly solely from Project Revenues (as defined in the Act). The 1974 General Ordinance is the governing ordinance under which all outstanding Water and Sewer Revenue Bonds have been issued.

On May 18, 1989, Philadelphia's City Council enacted the General Water and Wastewater Revenue Bond Ordinance of 1989 (the "1989 General Ordinance"). The 1989 General Ordinance was enacted to modernize the requirements applicable to the City's Water and Sewer Revenue Bonds. The 1989 General Ordinance allows the City flexibility to address new developments in financing techniques and to adapt its financing to developments in federal tax law. The 1989 General Ordinance establishes a rate covenant requiring that net revenues of the City's Water and Wastewater Systems exceed debt service requirements on bonds, including the Sixteenth Series Bonds, by 20 percent, and establish a Rate Stabilization Fund. The 1989 General Ordinance became effective upon the payment or defeasance in full of all Water and Sewer Revenue Bonds issued prior to the Water and Sewer Revenue Bonds, Fourteenth Series. The provisions of the 1989 General Ordinance supersede the provisions of the 1974 General Ordinance and are applicable to the Sixteenth Series Bonds. However, the obligation of the City under the Sixteenth Supplemental Ordinance to maintain the segregation of Bond proceeds and Project Revenues in the Water Account held by the Fiscal Agent will continue if and for so long as the Sixteenth Series Bonds are outstanding.

Additional information and details on the Sixteenth Series Bonds are provided in excerpts of the Bond Prospects, Appendix N.

As of April 15, 1991, the City had outstanding $1,052,000 aggregate principal amount of Water and Sewer Revenue Bonds, including variable rate bonds in the aggregate principal amount of $35,400,000. The City also had outstanding $96,200,000 of bond anticipation notes payable from concurrently with the Bond Anticipation Notes. In addition, as of April 15, 1991, the City had outstanding $41,112,413 aggregate principal amount of general obligation bonds attributable to the Water and Wastewater Systems. These general obligation bonds, issued for Water and Wastewater Systems improvements prior to enactment of the 1974 General Ordinance, were determined to be self-liquidating by the Court of Common Pleas of Philadelphia County and are payable from Project Revenues.

7.3.2.2 Federal Grants

The Water Department has received federal grant funds from EPA to upgrade its three WPCPs. The upgrades are estimated to cost approximately $850 million. To date, the Water Department has received federal grant funds in the amount of approximately $580 million. The payment of additional grant funds will be determined by EPA during the closeout process and audit of these grants.

To date, 15 of the total 34 grant agreements have been audited. An audit of an additional 11 grant agreements for the Northeast WPCP was started in March 1991. The remaining eight grant agreements for the Southwest WPCP and the Sludge Processing and Disposal Center are awaiting audit by the EPA.

The Water Department has received approximately $7.5 million in innovative/alternative grant commitments for the Northeast and Southwest WPCPs related to cogeneration projects. The receipt of these funds is predicated on the Water Department's construction and operation of cogeneration facilities that utilize at least 90 percent of the excess methane gas produced by the WPCPs. These facilities go on line in May of 1993.

7.3.2.3 State Grants

Pursuant to the Pennsylvania Clean Streams Law, Act. No. 339 of the Commonwealth of Pennsylvania, approved August 20, 1953 ("Act 339"), the Water Department receives annual grants from the Commonwealth toward the costs of operating, maintaining, repairing, and replacing its wastewater system that are equal to two percent of the cost of acquisition and construction of eligible wastewater treatment facilities. Costs funded by EPA grants and other nonreimbursed federal and state grant programs are not included in the calculation of the costs of acquisition and construction. Act 339 payments are included in nonoperating revenue of the Water Department.

7.3.2.4 Current Rate Structure

The Philadelphia Code requires the Water Department to give written notice to City Council at least 30 days in advance of the filing of notice of any proposed change in water or sewer rates or charges and to submit with such written notice financial, engineering, and other data upon which

the proposed changes are based. After the filing of the proposed regulations providing for changes in rates or charges with the City's Department of Records, the Department of Records is required to give public notice that the regulations have been filed and that any person affected by the proposed regulations may request a public hearing before the Water Department and the City Solicitor. Revised rates and charges become effective 10 days after filing of a report by the Water Department at the conclusion of hearings.

On April 23, 1990, the Water Commissioner formally notified City Council of his intention to raise rates for Water Department customers by an average 56 percent on December 1, 1990. This notification set a rate process in motion that included extensive public hearings conducted by an independent hearing examiner. This process culminated eight months later in the Water Commissioner's Rate Decision, which increased charges to the Water Department's typical residential customers by an average 33 percent, effective January 1, 1991. Large users experienced higher rate increases as certain fixed costs were spread on a volumetric basis for the first time.

The City's general service customers' water rate consists of a service charge related to the size of the meter, plus a schedule of quantity charges for all water use. The sewer rate is similar in form. All general service customers are billed on a monthly basis. Special charges are imposed for processing high-strength effluents.

The Water Department estimates that a typical customer has a 5/8-inch meter and uses 10.0 thousand cubic feet (Mcf) of water per year, which, based on the current rate schedule, results in an annual charge of $301.20 for sewer service.

Contracts for wastewater treatment service with ten neighboring municipalities and authorities provide for the quarterly billing of charges based on operating costs attributable to the volume and strength of wastewater received. Capital costs are handled by one of two different methods - five contract customers are billed quarterly for depreciation and capital payments on allocated wastewater conveyance and treatment facilities, while five contracting entities have made capital contributions to the Water Department for their share of the cost of facilities.

In order to maintain and improve the level and timing of collections, the Water Department, in conjunction with independent consultants, conducted a study of its billing and collection procedures in 1985. Results indicated relative stability in collection factors, with overall collections averaging approximately 95 percent of gross billings and 97 percent of net billings during the three-year period after billing, with the bulk of collections in the first year. First year collections from general service customers averaged approximately 90 percent of net billings. The collection experience of the Water Department since the date of the study is consistent with the results of the study.

Increased charges for wastewater service effective January 1, 1991, are estimated to produce an additional $27,328,000 in Fiscal Year 1991 and $80,000,000 in each fiscal year thereafter. This rate increase has resulted in an increase of approximately 33 percent in a typical customer's bill. This rate increase has been appealed by a consumer group.

7.3.2.5 Operating Budget

The Charter requires City Council to adopt a balanced Operating Budget for the fiscal year on or before May 31 of each year. The Mayor presents his operating budget proposal to City County on or about March 31 of each year. The Mayor's operating budget is developed from proposed budgets submitted by the various departments of the City, including the Water Department. The Water Department begins preparation of its proposed operating budget each September, when all divisions are supplied with documentation to complete and return to the Finance Division reflecting their budgetary requests for the next fiscal year. The Water Department has developed and installed a computerized budgeting system to prepare budget requests based on historical and current operating experience. Divisional budget proposals setting forth estimated obligations for the ensuing fiscal year are submitted to the Finance Division in November of each year. Revenue estimates are prepared by the Revenue Department under the direction of the City's Finance Department and Water Department. The Water Commissioner reviews all divisional budget proposals with the assistance of the Finance Division and submits the Water Department's proposed budget to the City's Managing Director in January of each year, who in turn submits all departmental proposed budgets to the Finance Director for the Mayor's approval for inclusion in the Mayor's proposed budget.

Under the City's "Legally Enacted Basis" of accounting, a reservation of funds is established for the estimated maximum contract limit, prior to the initiation of the delivery of services, supplies, or equipment for each contract. This reservation of funds or "encumbrance" accounting system requires that the Water Department budget a slightly higher level of funds than its actual annual requirements might be under a cash basis of accounting, since the actual costs of each contract cannot be determined, in many instances, until after the fiscal year has ended. These "excess" encumbered funds are returned to the fund balance when the contract is liquidated, usually early in the ensuing fiscal year. The proposed Fiscal Year Operating Budget proposed by the Mayor includes an adjustment to the estimated fund balance at the close of the current Fiscal Year due to cancellation of commitments encumbered and not expended.

7.3.2.6 Capital Budget and Future Funding

The Charter requires the City Council to adopt annually, on or prior to May 31, a capital budget for the ensuing fiscal year and a capital program showing the capital expenditures planned for each of the six ensuing fiscal years. The Capital Improvement Program of the Water Department for the Fiscal Years 1993 to 1997 and the Water Department's 1992 capital budget described below were submitted for City Council's approval as part of the City's capital program and capital budget. The City may change the elements of the Capital Improvement Program from time to time and may change the proposed financing schedule reflected in the Capital Improvement Program.

Table 7.3.1 sets forth major elements of the Water Department's proposed Capital Improvement Program for Fiscal Years 1992-1997. The capital budget adopted by City Council on May 30, 1991, included an additional $28,200,000 for the Water Department's Capital Improvement Program. Additional Water and Sewer Revenue Bonds would need to be issued if the Water Department were to utilize this additional capital allocation.

BCM

TABLE 7.3.1

Fiscal Year 1992-1997
Capital Improvement Program

ELEMENTS	
Engineering and Administration	$ 73,847,000
Water Conveyance System	108,560,000
Sewage Collector System	81,600,000
Storm Flood Relief	14,900,000
Water Treatment Plants	49,745,000
Wastewater Treatment Plants	39,917,000
Vehicle Acquisition	20,000,000
TOTAL	**$388,596,000**
FUNDING SOURCES	
Debt Financing	$328,580,000
Project Revenues	60,016,000
TOTAL	**$388,596,000**

Estimated debt requirements for Fiscal Years 1991-1996 based on the 1991-1996 Capital Improvement Program.

Fiscal Year	Assumed Issued Date	Assumed Bond Principal
1991	6/6/91	$289,695,000*
1992	---	---
1993	---	---
1994	7/1/93	65,000,000
1995	7/1/94	85,000,000
1996	7/1/95	100,000,000

*Represents the estimated par value of the Sixteenth Series Bonds as of April 26, 1991.

Approximately 85 percent of the costs of the Capital Improvement Program are expected to be funded with the proceeds of debt to be incurred during the 6-year period. The City expects most of such debt to be in the form of Water and Sewer Revenue Bonds issued under the Act and the 1974 General Ordinance and the 1989 General Ordinance. A portion of the debt may be evidenced by loans to the City from the Pennsylvania Infrastructure Investment Authority ("PENNVEST"), established by the Commonwealth to provide low interest cost financing for water and wastewater projects within the Commonwealth. The Water Department has received a commitment for and is negotiating the terms of a loan from PENNVEST in the amount of $20 million for water system projects. The Water Department anticipates that, if the PENNVEST loan transaction is consummated, the City's obligation to PENNVEST with respect to this loan will be evidenced by a Seventeenth Series of Water and Sewer Revenue Bonds. Any loans received by the Water Department from PENNVEST will reduce the amount of future Water and Sewer Revenue Bonds sold to the public.

7.4 IMPLEMENTATION SCHEDULE

This regional Act 537 Plan for the City of Philadelphia has evaluated sewerage facilities, developed recommendations, and selected a Plan for implementation. Discussion on this Selected Plan is incorporated into Section 7.2 of this report. A capsular implementation schedule is as follows:

Item	Selected Plan	Schedule
1. Unsewered Needs Areas	• Further detailed (field) evaluations	• Start within 3 months of Plan approval.
2. Collection & Conveyance	• Continue with CIP	• As approved by PWD and City Council
3. CSO's	• Develop Plan of Action (Conceptual Plan)	• As mandated by PADER in forthcoming NPDES permits.
4. WPCP's	• Continue with CIP	• As approved by PWD and City Council
	• Rehab NEWPCP Primaries	• Ongoing
	• SWWPCP Mods	• Maintain Consent Order Schedule
	• High Flow Management (CSO Plan of Action/Plant Rerate)	• Begin within 3 months of Act 537 approval or as otherwise required.
5. Biosolids Management	• Optimize through additional studies	• Begin within 3 months of Act 537 approval.

It should be noted that there are many more activities discussed in the Act 537 Plan; however, the above are the primary areas of focus. The future milestone dates for implementation, for example for CSO's and Biosolids, will be based upon and incorporated into the findings of these further studies.

MEMORANDUM

CITY OF PHILADELPHIA

WATER DEPARTMENT
CONSTRUCTION BRANCH

DATE: March 1, 1995

TO: DISTRIBUTION

FROM: LEONARD K. BERNSTEIN, SPECIAL PROJECTS COORDINATOR

SUBJECT: ACT 537 PLAN

As you might be aware, the Water Department was required to prepare a Sewage Facilities Plan in accordance with Pennsylvania Act 537. This plan, known as the Act 537 Plan, was prepared by BCM Engineers and contains much valuable information about our wastewater system.

The Plan consists of two volumes. The first volume contains most of the important information. The second volume contains a number of appendices. The appendices are listed on page xii of the Table of Contents in the first volume. Due to the cost of the copies, I am not providing everyone with a copy of Volume 2. If you, after reviewing the list of appendices, feel that you would like to have copies of some of the appendices, let me know and I'll have copies of those specific appendices made for you.

Leonard K. Bernstein

LEONARD K. BERNSTEIN
Special Projects Coordinator

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* Volume I only

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City of Philadelphia
Water Department
Wastewater Treatment Service Agreements
and
Approval Procedure for Requests for Exemption From Planning

The Philadelphia Water Department has contractual agreements to provide wastewater treatment services with ten municipalities or authorities. The following is a listing of the municipalities or authorities and the areas covered by the respective service agreements:

Abington Township: the drainage area includes the area of the Pennypack Creek watershed in Abington Township and Rockledge Borough and portions of the Tacony Creek watershed in Rockledge Borough and Abington Township.

Bensalem Township Authority: the drainage area includes the area of Bensalem Township within the Poquessing Creek watershed.

Bucks County Water and Sewer Authority: the drainage area covers those areas within the Bucks County Water and Sewer Authority serviced by the Neshaminy Interceptor system and the Totem Road Pumping Station. This includes all or parts of the following municipalities:

Bensalem Township
Bristol Township
Falls Township
Hulmeville Borough
Langhorne Borough
Langhorne Manor Borough
Lower Makefield Township
Lower Southampton Township
Middletown Township
Newtown Borough
Newtown Township
Northampton Township
Penndel Borough
Wrightstown Township

Cheltenham Township: the drainage area includes areas of the Tacony Creek watershed in Cheltenham Township, Abington Township, and Jenkintown Borough.

The Delaware County Regional Water Quality Control Authority (DELCORA): the drainage area includes areas in the Darby, Crum, Ridley, and Chester Creek watersheds and once coincided with the service boundaries of the Muckinipates, Central Delaware County, Darby Creek Joint, and Radnor-Haverford-Marple Authorities. This includes all or parts of the following municipalities:

Aldan Borough	Lansdowne Borough	Ridley Township
Clifton Heights	Marple Township	Rutledge Borough
Collindale Borough	Morton Borough	Sharon Hill Borough
Colwyn Borough	Nether Providence Twp	Springfield Township
Darby Borough	Newtown Township	Swarthmore Borough
Darby Township	Norwood Borough	Tredyffrin Township (Chester County)
Folcroft Borough	Prospect Park Borough	Upper Darby Township
Glenolden Borough	Radnor Township	Yeadon Borough
Haverford Township	Ridley Park Borough	

Lower Merion Township: the drainage area includes all of Lower Merion Township and the portions of Radnor, Haverford, and Narberth within the drainage basin of the Schuylkill River.

Lower Moreland Township and the Lower Moreland Township Authority: the drainage area includes portions of Lower Moreland within both the Pennypack and Poquessing Creek watersheds.

Lower Southampton Municipal Authority: the drainage area includes the areas of Lower Southampton within the Poquessing Creek watershed.

Springfield Township, Montgomery County: the drainage area includes the areas of Springfield, Cheltenham, Upper Dublin, and Whitemarsh Townships within the Wissahickon Creek watershed.

Upper Darby Township: the drainage area includes those portions of Upper Darby Township not included in the DELCORA agreement and parts or all of East Lansdowne Borough, Haverford Township, Millbourne Borough, and Yeadon Township.

Since we provide wastewater treatment services on a contractual basis to these municipalities and authorities, we require that all Requests for Exemption from planning and the submission of Act 537 Sewage Facilities Planning Modules from these service areas be approved by our contracted municipality or authority before our review of the Request for Exemption. We must be assured that we can accommodate the additional flows and that they are permitted under our service agreements before we can allow additional flows into our system or approve exemption requests. Furthermore, we will return any submissions that do not indicate an acceptance of the additional flows by the municipality or authority under contract with us.

Requests for Exemption must include a Project Narrative and letter of acceptance. Completed Requests for Exemption are to be submitted to:

Leonard K. Bernstein, P.E.
Special Projects Coordinator
Philadelphia Water Department
ARAMARK Tower, 2nd Floor
1101 Market Street
Philadelphia, PA 19107-2994

Revised: 2/23/00

Philadelphia
PWD
Water Department

Volume 2

APPENDICES

City and County of Philadelphia

Act 537 Plan

BCM Engineers Inc.
Engineers, Planners, Scientists, and Laboratory Services

REPORT TO

CITY OF PHILADELPHIA
PHILADELPHIA WATER DEPARTMENT
PHILADELPHIA, PENNSYLVANIA

FOR

PHILADELPHIA
ACT 537

MARCH 1993
REVISED MAY 1993

BCM PROJECT NO. 00-0740-0201

BCM

Engineers, Planners, Scientists and Laboratory Services
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APPENDIX A

Wastewater Control Regulations

CITY OF PHILADELPHIA

WASTEWATER CONTROL

REGULATIONS

EFFECTIVE JUNE 11, 1990

CITY OF PHILADELPHIA

WATER DEPARTMENT

WASTEWATER CONTROL REGULATIONS

WHEREAS, the Philadelphia Home Rule Charter, Section 5-800 et seq mandates that the Philadelphia Water Department operate the City of Philadelphia water supply and wastewater collection systems; and

WHEREAS, the Philadelphia Water Department must insure sound and safe operation of the wastewater treatment plants and sewer collection system; and

WHEREAS, the federal Clean Water Act requires that the City prevent th introduction of pollutants into the City wastewater system which will interfer with the operation of the system or contaminate the resulting sludge; and

WHEREAS, the federal Clean Water Act requires that the City prevent t introduction of pollutants into the City wastewater system which will pass through the system, inadequately treated, into receiving waters or the atmosphere or otherwise be incompatible with the system; and

WHEREAS an objective of the federal Clean Water Act is to improve the opportunity to recycle and reclaim wastewaters and sludges from the system.

NOW THEREFORE, the City of Philadelphia Water Department promulgates these Wastewater Control Regulations.

INDEX

SECTION 1 GENERAL PROVISIONS

1.1 PURPOSE AND POLICY

The purposes of these regulations are:

(a) To set forth uniform requirements for direct and indirect contributors to the wastewater collection and treatment system ("wastewater system") owned and operated by the City of Philadelphia ("City") and to enable the City to comply with all applicable state and federal laws required by the Clean Water Act of 1977 as amended and the General Pretreatment Regulations (40 CFR Part 403).

(b) To prevent the introduction of pollutants into the City wastewater system which will:

(1) interfere with the operation of the system;

(2) contaminate the resulting sludge;

(3) cause the wastewater system to violate its NPDES discharge permit;

(4) pass through the system, inadequately treated, into receiving waters or the atmosphere;

(5) be otherwise incompatible with the system.

(c) To improve the opportunity to recycle and reclaim wastewaters and sludges from the system.

These regulations provide for the regulation of direct and indirect contributo to the City wastewater system through the issuance of permits to certain non-domestic users and Industrial Users and through enforcement of general require ments for the other Users; authorize monitoring and enforcement activities; require User reporting and compliance schedule submissions.

1.2 DEFINITIONS

Unless the context specifically indicates otherwise, the following terms and phrases, as used in these regulations, shall have the following meanings:

(1) Act or "the Act". The Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 U.S.C. 1251, et seq.

(2) Approval Authority. The Director in an NPDES state with an approved State Pretreatment Program and the Administrator of the EPA in a non-NPDES state or NPDES state without an Approved State Pretreatment Program.

(3) Authorized Representative of Industrial User.

(1) In the case or a corporation, a president, secretary, treasurer or vice president of the corpration in charge of a principal business function;

(2) In the case of a partnership or proprietorship, a general partner or proprietor; and

(3) A duly authorized representative of the individual designated above if (a) such representative is responsible for the overall operation of the facilities from which the indirect discharge into the POTW originates; (b) the authorization is in writing; and (c) the written authorization is submitted to the POTW.

(4) Biochemical Oxygen Demand $(BOD)_5$. The quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure for five (5) days at 20 degrees centigrade expressed in terms of weight and concentration (milligrams per liter (mg/l)).

(5) Building Sewer. A private sewer conveying wastewater from the premises of a User to the City wastewater system.

(6) Bypass. The intentional diversion of wastestreams from any portion of an Industrial User's pretreatment facility.

(7) Categorical Standards. National Categorical Pretreatment Standards or Pretreatment Standard.

(8) City. The City of Philadelphia.

(9) Commissioner. Water Commissioner of the City of Philadelphia.

(10) Commonwealth. The Commonwealth of Pennsylvania.

(11) Composite Sample. A timed sequential collection of samples of equal volume or a collection of grab samples combined in a single reservoir to determine concentration(s) of pollutant(s).

(12) Cooling Water. The water discharged from any use such as air conditioning, cooling or refrigeration, or to which the only pollutant added is heat and which does not contain a level of contaminants detectably higher than that of the source of the water.

(13) Control Authority. The term "control authority" shall refer to the City of Philadelphia Water Department and/or the City Water Commissioner.

(14) Daily Maximum. The maximum allowable discharge of a pollutant during calendar day. Where maximum limitations are expressed in units of mass, the daily discharge is the total mass discharged over the course

of a day. Where daily maximum limitations are expressed in terms of concentration, the daily discharge is the arithmetic average measurement of the pollutant derived from all measurements taken that day.

(15) Department. Water Department of the City of Philadelphia.

(16) Direct Discharge. The discharge of treated or untreated wastewater directly to the waters of the Commonwealth of Pennsylvania which may occur through the City's stormwater conduits or combined sewer outfall structures.

(17) Environmental Protection Agency or EPA. The United States Environmental Protection Agency, or where appropriate the term may also be used as a designation for the Administrator or other duly authorized official of said agency.

(18) Flashpoint. The temperature at which a liquid or volatile solid gives off vapor sufficient to form an ignitable mixture with the air near the surface of the liquid or within the test vessel. Flashpoint is determined by the tagliabue open cup method (American Society for testing Materials D1310-63), usually abbreviated TOC.

(19) Grab Sample. A sample which is taken from a waste stream on a one-time basis with no regard to the flow in the waste stream and without consideration of time.

(20) Holding tank waste. Any waste from holding tanks such as vessels, chemical toilets, campers, trailers, septic tanks, and vacuum-pump tank trucks.

(21) Indirect Discharge. The discharge or the introduction of pollutants from any nondomestic source regulated under sections 307(b) or (c) of the Act, (33 U.S.C. 1317), into the POTW (including holding tank waste discharged into the system).

(22) Industrial User or User. Any person that introduces an indirect discharge regulated under the Act, state or local law to the POTW.

(23) Interference. The inhibition or disruption of the POTW treatment processes, operations, or maintenance activities alone or in conjunction with other discharges which contributes to a violation of any requirement of the City's NPDES Permit. The term includes prevention of sewage sludge use or disposal by the POTW in accordance with Section 405 of the Act (33 U.S.C. 1345) or any criteria, guidelines, or regulations developed pursuant to the Solid Waste Disposal Act (SWDA), the Clean Air Act, the Toxic Substances Control Act, or more stringent state criteria (including those contained in any State sludge management plan prepared pursuant to Title IV of SWDA) applicable to the method of disposal or use employed by the POTW.

(24) Monthly Average. The arithmetic mean of the values for effluent samples collected over a calendar month.

(25) National Categorical Pretreatment Standard or Pretreatment Standard. Any regulation containing pollutant discharge limits promulgated by the EPA in accordance with sections 307(b) and (c) of the Act (33 U.S.C. 1341) which applies to a specific category of Industrial Users and pretreatment standards as published in 40 CFR Chapter I, Sub Chapter Parts 401-471.

(26) National Pollution Discharge Elimination System or NPDES Permit. A permit issued pursuant to section 402 of the Act (33 U.S.C. 1342).

(27) National Prohibitive Discharge Standard or Prohibitive Discharge Standard. Any regulation developed under the authority of Section 307(b) of the Act and 40 CFR Section 403.5.

(28) New Source. Any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced after the publication of proposed pretreatment standards under 307(c) of the Act which will be applicable to such source if such Standards are thereafter promulgated in accordance with that section.

(29) Non-Domestic Users. Commercial, industrial, municipal or other users whose discharge may have an effect on the wastewater system.

(30) Pass Through. A discharge which exits the POTW to the receiving stream or its atmosphere in quantities or concentrations which alone or in conjunction with other discharges is a cause of a violation of any requirement of the POTW's NPDES permit or a violation of any air emission standard set by the Clean Air Act, State or local rules and regulations governing emissions to the air (including an increase in the magnitude or duration of a violation).

(31) Person. Any individual, partnership, copartnership, firm, company, corporation, association, joint stock company, trust, estate, governmental entity or any other legal entity, or their legal representatives, agents or assigns. The masculine gender shall include the feminine, the singular shall include the plural where indicated by the context.

(32) pH. The logarithm (base 10) of the reciprocal of the concentration of hydrogen ions expressed in grams per liter of solution.

(33) Pollution. The man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water.

(34) Pollutant. Any dredged spoil, solid waste, incinerator residue, sewage; garbage; sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discharged equipment, rock, sand, cellar dirt, industrial, municipal, and agricultural waste or any other contaminant discharged into water.

(35) Pretreatment or Treatment. The reduction of the amount of pollutants the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater to a less harmful state prior to d in lieu of discharging or otherwise introducing such pollutants into POTW. The reduction, elimination or alteration can be obtained by phy sical, chemical or biological processes, process changes, or other means, except as prohibited by 40 CFR Section 403.6(d).

(36) Process waste water. Any water which, during manufacturing or processing, comes into direct contact with or results from the productio or use of any raw material, intermediate product, finished product, by product, or waste product.

(37) Pretreatment Requirements. Any substantive or procedural requiremen related to pretreatment, other than a National Pretreatment Standard imposed on an Industrial User.

(38) Publicly Owned Treatment Works (POTW). A treatment works as defined section 212 of the Act (33 U.S.C. 1292) which is owned by the City

including any devices and systems used in the storage, treatment, recycling or reclamation of municipal sewage and industrial waste. This definition includes any sewers that convey wastewater to the POTW treatment plant, but does not include pipes, sewers or other conveyances not connected to a facility providing treatment. For the purposes of this regulation, "POTW" shall also include any sewers that convey wastewaters to the POTW from persons outside the City who are, by contract or agreement with the City, users of the City's POTW.

(39) POTW Treatment Plant or Treatment Plant. That portion of the POTW designed to provide treatment to wastewater.

(40) Shall is mandatory; May is permissive.

(41) Significant Industrial User. Any Industrial User of the City's wastewater disposal system who (i) discharges an average of 25,000 gallons or more per day of process waste water or whose discharge contributes up to 5 percent or more of the average dry weather capacity of the POTW; or (ii) has in its wastes toxic pollutants as defined pursuant to Section 307 of the Act, or Pennsylvania Statutes and Rules or (iii) is found by the City, DER or EPA to have significant impact, either singly or in combination with other contributing users, on the wastewater treatment system, the quality of sludge, the system's effluent quality, or air emissions generated by or from the system, or (iv) is categorically regulated by the Act.

(42) State. The Commonwealth of Pennsylvania.

(43) Standard Industrial Classification (SIC). A classification pursuant to the Standard Industrial Classification Manual issued by the Executive

Office of the President, Office of Management and Budget, 1972, as amended.

(44) Storm Water. Any flow occurring during or following any form of natural precipitation and resulting therefrom.

(45) Suspended Solids. The total suspended matter that floats on the surface of, or is suspended in water, wastewater or other liquids, and which is removable by laboratory filtering expressed in terms of weigh and concentration (milligrams per liter (mg/l)).

(46) Toxic Pollutant. Any pollutant or combination of pollutants listed as toxic pursuant to Pennsylvania Statues and Rules, Section 307(a) of th Act or other Federal statutes.

(47) Wastewater. The liquid and water-carried industrial or domestic wastes from dwellings, commercial buildings, industrial facilities, and insti tutions, whether treated or untreated.

(48) Waters of the Commonwealth. All streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the Commonwealth or any portion thereof.

(49) Wastewater Discharge Permit. As set forth in section 3.2 of these regulations.

1.3 ABBREVIATIONS

The following abbreviations shall have the designated meanings:

- BOD - Biochemical Oxygen Demand.
- CERCLA - Comprehensive Environmental Response and Clean Up Liabilities Act
- CFR - Code of Federal Regulations.
- COD - Chemical Oxygen Demand.
- DER - Pennsylvania Department of Environmental Resources.
- EPA - United States Environmental Protection Agency
- l - Liter.
- mg - Milligrams.
- mg/l - Milligrams per liter.
- NPDES - National Pollutant Discharge Elimination System.
- POTW - Publicly Owned Treatment Works.
- RCRA - Resource Conservation and Recovery Act
- SIC - Standard Industrial Classification.
- SIU - Significant Industrial User.
- SWDA - Solid Waste Disposal Act, 42 U.S.C. 6901, et seq.
- TSS - Total Suspended Solids.
- USC - United States Code.

SECTION 2 - REGULATIONS

2.1 GENERAL DISCHARGE PROHIBITIONS

a) No User shall contribute or cause to be contributed, directly or indirectly, to the POTW any pollutant or wastewater which will interfere with the opera-

receiving waters of the POTW, or may exceed the limitation set forth i a Categorical Pretreatment Standard or may violate the Clean Air Act. A toxic pollutant shall include but not be limited to any pollutant identified pursuant to Section 307(a) of the Act.

5) Any noxious or malodorous liquids, gases, or solids which either singly or by interaction with other wastes are sufficient to create a public nuisance or hazard to life or are sufficient to prevent entry into the sewers or treatment plant facilities for maintenance and repair withou respiratory protection or other personal safety equipment.

6) Any substance which may cause the POTW's effluent or any other product of the POTW such as residues, sludges, or scums, to be unsuitable for reclamation and reuse or to interfere with the reclamation process. In no case shall a substance discharged to the POTW cause the POTW to be in non-compliance with sludge use or disposal criteria, guidelines or regulations developed under Section 405 of the Act, nor any criteria, guidelines, or regulations affecting sludge use or disposal developed pursuant to the Solid Waste Disposal Act, the Clean Air Act, the Toxic Substances Control Act, or State criteria applicable to the sludge management methods being used by City.

7) Any substance which will cause the POTW to violate its NPDES and/or State Disposal System Permit or the receiving water quality standards.

8) Any wastewater with objectionable color not removed in the treatment process, such as, but not limited to, dye wastes and vegetable tannin solutions.

9) Any wastewater having a temperature which will inhibit biological activity in the POTW treatment plant resulting in Interference, but in no case wastewater with a temperature at the introduction into the POTW which exceeds 60°C (140°F) or which shall cause the wastewater entering the POTW Treatment Plant to exceed 40°C (104°F).

10) Any pollutants, including oxygen demanding pollutants (BOD, etc.) and suspended solids released at a flow rate and/or pollutant concentration which a user knows or has reason to know will cause Interference or Passthrough to the POTW. In no case shall a slug load have a flow rate or contain concentration or quantities of pollutants that exceed for any time period longer than fifteen (15) minutes more than five (5) times the average twenty-four (24) hour permitted concentration, quantities, or flow during normal operation.

11) Any wastewater containing any radioactive wastes or isotopes of such half life or concentrations as may exceed limits established by the Commissioner in compliance with applicable State or Federal regulations.

12) Any wastewater which causes a hazard to human life or creates a public nuisance.

13) Any wastewater containing motor oils or lubricants removed from vehicles or other machinery.

14) Any wastewater containing substances which may solidify or become viscous at temperatures between 32° and 150°F.

15) Any sludges from septage or holding tanks without specific prior approval of the Department.

16) Any wastewater which because of its chemical nature or composition causes the sewer atmosphere to contain airborne chemical concentrations in exceedance of concentrations established by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) under 29 CFR Section 1910, regardless of duration of exposure experienced by any individual, whether a Department or contractor's employee, unless specific authorization is granted by the Commissioner.

17) Any wastewater with a flashpoint less than 140°F.

18) Any wastewater where there is a significant likelihood of producing toxic effects to biota in the receiving water of the POTW or the POTW's effluent.

In addition, the following activities are prohibited:

19) No person shall discharge wastewater into street inlets or through sewer manholes.

20) No person who generates wastewater at one property shall discharge it at another property without approval from the City.

21) No person shall discharge wastewater in quantities or at rates of flow which may have an adverse or harmful effect on or overload the Department's sewerage system or wastewater treatment plants or cause excessive or additional treatment costs.

22) No person shall discharge a wastewater flow contributing greater than 2,500 pounds per day of the five day biochemical oxygen demand, or contributing greater than 1,750 pounds per day of suspended solids or

having a volume in excess of three (3) million gallons per day without specific written approval of the City.

23) No person shall store or handle any material including hazardous substances defined by CERCLA, in any area draining to the city sewer system, because discharge or leakage from such storage or handling may create an explosion hazard in the sewer system or treatment plant or may constitute a hazard to human beings or animals or the receiving stream, or in any other way may have a deleterious effect upon the wastewater treatment facilities. Such storage or handling shall be subject to review by the City, and shall require a spill control plan with reasonable safeguards to prevent discharge or leakage of such materials into the sewers.

c) When the Department determines that a User is contributing to the POTW amounts of wastewater described in paragraphs a) 1) through 18) or is involved in activities described in paragraphs 19) through 23) so as to Interfere or Passthrough with the operation of the POTW, the Department shall: 1) advise the User(s) of the impact of the contribution on the POTW; and 2) develop effluent limitation(s) for such user to correct the Interference or Passthrough with the POTW without the need to amend these regulations.

2.2 FEDERAL CATEGORICAL PRETREATMENT STANDARDS

Any Federal Categorical Pretreatment Standard published in 40 CFR Chapter I, Subchapter N, Parts 401-407, as amended, more stringent than limitations imposed under these regulations or by permit for sources in that category, shall supersede the limitations imposed under these Regulations.

2.3 MODIFICATION OF FEDERAL CATEGORICAL PRETREATMENT STANDARDS

Where the City's wastewater treatment system achieves consistent removal of pollutants limited by Federal Pretreatment Standards, the City may apply to the Approval Authority for modification of specific limits in the Federal Pretreatment Standards of an Industrial User or a whole category.

2.4 SPECIFIC POLLUTANT LIMITATIONS

a) No person shall discharge wastewater containing in excess of:

	Daily Maximum		Monthly Average
arsenic	0.01	mg/l	0.005
cadmium	0.2		0.1
copper	4.5		2.7
lead	0.69		0.43
mercury	0.01		0.005
nickel	4.1		2.6
silver	0.43		0.24
total chromium	7.0		4.0
zinc	4.2		2.6
selenium	0.2		0.1

b) No person shall discharge wastewater containing any of the materials listed herein into the City sewer or shall have any connection to the City sewer without obtaining written permission from the City.

Acrylonitrile
Aldrin
Alpha BHC
Aluminum
Barium
Benzene
Benzo (a) pyrene
Benzotrichloride
Beryllium
Bis(2-ethylhexyl)phthalate (DEHP)
Bromobenzene
Bromodichloromethane
Bromoform
Carbon tetrachloride
Chlordane
Chlorobenzene
Chlorodibromomethane
Chloroethane

Chloroform
Cumene
DDT/DDE/DDD
Dibutylphthalate
Dichlorobromomethane
Dichloroethyl ether (Bis(2-chloroeth
Dieldrin
diisobutylenes
Dimethylnitrosamine
Ethylbenzene
Heptachlor
Hexachlorobutadiene
Hexachlorobenzene
Iron
Isopropylbenzene
Lindane
M-Dichlorobenzene
Methyl chloride (Chloromethane)
Molybdenium
o,m,p-Xylenes
o-Chlorotoluene
o-Dichlorobenzene
p-Chlorotoluene
para-Dichlorobenzene
PCB-1248
PCB-1260
Phenanthrene
Phenols
Pyrene
Styrene
Tetrachloroethylene (Perchloroethylene)
Tin
Titanium
Toluene
Toxaphene (chlorinated camphene)
Trichloroethylene
Vinyl chloride
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethlyene
1,1-Dichloropropene
1,2 trans,dichloroethylene
1,2,3-Trichloropropane
1,2-cis,dichloroethylene
1,2-Dibromo-3-Chloropropane
1,2-Dichloroethane
1,2-Dichloropropane
1,3-Dichloropropane
1,3-Dichloropropene
1,4-Dichlorobenzene(p)
2-Chlorophenol
2,2-Dichloropropane
2,4-Dinitrophenol

2,4-Dinitrotoluene
3,3-Dichlorobenzidiene

The City reserves the right to modify this list of materials prohibited from entering the POTW as may become necessary by virtue of new state or federal regulations.

c) Chlorine and Ammonia. The free chlorine and/or free ammonia content of the waste shall be limited to 5 mg/l at any time as shown by grab sample. In particular instances where a mist-free atmosphere, as needed during inspection and maintenance of a sewer, or to protect the POTW, is otherwise not attainable, the Department may direct the User to further reduce its discharge of chlorine and ammonia, either on a temporary or permanent basis, so as to eliminate formation of mist, in order to permit such inspection and maintenance and protect the POTW.

d) Hydrogen Sulfide. The hydrogen sulfide content of the waste shall not exceed 2 mg/l at any time as shown by grab sample.

e) Cyanide content. The cyanide content of the waste shall not exceed 1 mg/l total cyanide and 2 mg/l of cyanide readily released at 150°F and pH 4.5. Cyanide content of wastewater must be measured by grab sample.

f) Fats, Oils and Greases. Wastewaters shall not contain in excess of 1 mg/l of fats, oils and greases of mineral or petroleum or unknown origin at any time as shown by grab sample.

Wastewaters shall not contain in excess of 300 mg/l for fats, oils and greases of animal or vegetable origin, at any time as shown by grab sample. The above concentrations may be reduced by the Department where it is demonstrated that the concentration is causing chronic or repeated adverse effects to the sewage system.

2.5 STATE REQUIREMENTS

State requirements and limitations on discharges shall apply in any case where they are more stringent than Federal requirements and limitations or those in these regulations.

2.6 CITY'S RIGHT OF REVISION

The City reserves the right to establish by regulation more stringent limitations or requirements on discharges to the wastewater disposal system if deemed necessary to comply with the objectives presented in Section 1.1 of these Regulations.

2.7 EXCESSIVE DISCHARGE

No User shall ever increase the use of process water or, in any way, attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the limitations contained in the Federal Categorical Pretreatment Standards, or in any other pollutant-specific limitation developed by the City or State.

2.8 ACCIDENTAL DISCHARGES

a) Spill Prevention Plan

Each User shall provide protection from accidental discharge of prohibited materials or other substances which may interfere with the POTW by developing a Spill Prevention Plan. Facilities to prevent accidental discharge of prohibited materials shall be provided and maintained at the owner or User's own cost and expense. Detailed plans showing facilities and operating procedures to provide this protection shall be submitted to the

Department for review, and shall be approved by the Department before construction of the facility. All existing Users shall complete such a plan within 3 months of notice to do so by the Department. No User who commences a new discharge to the POTW after the effective date of these regulations shall be permitted to introduce pollutants into the system until accidental discharge procedures have been approved by the City. Review and approval of such plans and operating procedures shall not relieve the Industrial User from the responsibility to modify the User's facility as necessary to meet the requirements of these regulations.

b) Notification

(1) In the case of an accidental discharge, it is the responsibility of the User to immediately notify the Department of the incident by telephone The notification shall include date, time and location of discharge, type of waste including concentration and volume, duration of discharge, and any corrective actions taken by the User.

(2) Written Notice: Within five (5) days following an accidental discharge the User shall submit to the Department a detailed written report describing the cause of the discharge and the measures that will be taken by the User to prevent similar future occurrences. Such notification shall not relieve the User of any expense, loss, damage, or other liability which may be incurred as a result of damage to the POTW, fish kills, or any other damage to person or property; nor shall such notification relieve the User of any fines, civil penalties, or other liability which may be imposed by these regulations or other applicable law.

c) Notice to Employees

A notice shall be permanently posted on the User's bulletin board(s) or other prominent places advising employees whom to call in the event of a dangerous discharge. Employers shall advise all employees who may cause or be injured by such a discharge of the emergency notification procedure.

SECTION 3 - ADMINISTRATION

3.1 WASTEWATER DISCHARGERS

It shall be unlawful for any User to discharge without a City permit to sewer appurtenance outlet within the City, in any area under the jurisdiction of the City, and/or to the POTW any wastewater except as authorized by the City in accordance with the provisions of these regulations.

3.2 WASTEWATER DISCHARGE PERMITS

3.2.1 GENERAL PERMITS

All Significant Industrial Users proposing to connect to or contribute to the POTW shall obtain a wastewater discharge permit before connecting to or contributing to the POTW. All existing Significant Industrial Users connected to or contributing to the POTW shall obtain a wastewater discharge permit within 365 days after the effective date of these Regulations.

3.2.2 PERMIT APPLICATION

Users required to obtain a Wastewater Discharge Permit shall complete and file with the City an application in the form prescribed by the City. Existing Users shall apply for a wastewater discharge permit within 30 days

after the effective date of these regulations, unless the City has previously issued such a permit which has not expired. New Users shall apply at least 90 days prior to connecting to or contributing to the POTW. The City may waive the requirement for filing an application. In support of the application, the User shall submit, in units and terms appropriate for evaluation, the following information:

a) Name, address, and location (if different from the address);

b) SIC number according to the Standard Industrial Classification Manual, Bureau of the Budget, 1972, as amended;

c) Wastewater constituents and characteristics including but not limited to those mentioned in Section 2 of these regulations as determined by a reliable analytical laboratory; sampling and analysis shall be perform in accordance with procedures established by the EPA pursuant to Section 304(g) of the Act and contained in 40 CFR Part 136, as amended;

d) Time and duration of contribution;

e) Average daily and 30 minute peak wastewater flow rates, including daily, monthly and seasonal variations if any;

f) Site plans, floor plans, mechanical and plumbing plans and details to show all sewers, sewer connections, and appurtenances by the size, location and elevation;

g) Description of activities, facilities and plant processes on the prem ses including all materials which are or could be discharged;

h) Where known, the nature and concentration of any pollutants in the discharge which are limited by any City, State, or Federal Pretreatment Standards, and a statement regarding whether or not the pretreatment standards are being met on a consistent basis, and if not, whether additional operation and maintenance (O&M) and/or additional pretreatment is required for the User to meet applicable Pretreatment Standards;

i) Where additional pretreatment and/or O&M will be required to meet the Pretreatment Standards, the shortest schedule by which the User will provide such additional pretreatment. The completion date in this schedule shall not be later than the compliance date established for the applicable Pretreatment Standard.

The following conditions shall apply to this schedule:

(1) The schedule shall contain increments of progress in the form of dates for the commencement and completion of major events leading to the construction and operation of additional pretreatment required for the User to meet the applicable Pretreatment Standards (e.g., completing preliminary plans, completing final plans, executing contract for major components, commencing construction, completing construction, etc.).

(2) No increment referred to in paragraph (1) shall exceed 9 months.

(3) Not later than 14 days following each date in the schedule and the final date for compliance, the User shall submit a progress report to the Department including, at a minimum, whether or not it complied with the increment of progress to be met on such date and, if not, the date

on which it expects to comply with this increment of progress, the reason for delay, and the steps being taken by the User to return the construction to the schedule established. In no event shall more than nine (9) months elapse between such progress reports to the Department.

j) Each product produced by type, amount, process or processes and rate of production;

k) Type and amount of raw materials processed (average and maximum per day);

l) Number and type of employees, hours of operation of plant and proposed or actual hours of operation of pretreatment system;

m) Any other information as may be deemed by the City to be necessary to evaluate the permit application.

The City will evaluate the data furnished by the User and may require additional information. After evaluation and acceptance of the data furnished, the City may issue a wastewater discharge permit subject to terms and conditions provided herein.

3.2.3 PERMIT MODIFICATIONS

Within 90 days of the promulgation of a National Categorical Pretreatment Standard, the wastewater discharge permit of Users subject to such standards shall be revised to require compliance with such standard within the time frame prescribed by such standard. Where a User, subject to a National Categorical Pretreatment Standard, has not previously submitted an application for a wastewater discharge permit as required by 3.2.2, the User shall

apply for a wastewater discharge permit within 180 days after the promulgation of the Applicable National Categorical Pretreatment Standard. In addition, the User with an existing wastewater discharge permit shall submit to the Department within 180 days after the promulgation of an applicable Federal Categorical Pretreatment Standard the information required by paragraphs (h) and (i) of Section 3.2.2.

3.2.4 PERMIT CONDITIONS

Wastewater discharge permits shall be expressly subject to all provisions of these regulations and all other applicable regulations, User charges and fees established by the City. Permits may contain the following:

a) Limits on the average and maximum wastewater constituents and characteristics;

b) Limits on average and maximum rate and time of discharge or requirements for flow regulations and equalization;

c) Requirements for installation and maintenance of inspection and sampling facilities;

d) Specifications for monitoring programs which may include sampling locations, frequency of sampling, number, types and standards for tests and reporting schedule;

e) Compliance schedules;

f) Requirements for submission of technical reports or discharge reports (see Section 3.3);

g) Requirements for maintaining and retaining plant records relating to wastewater discharge as specified by the City, and affording City access thereto;

h) Requirements for notification of the City or any new introduction of wastewater constitutents or any substantial change in the volume or character of the wastewater constitutents being introduced into the wastewater treatment system;

i) Requirements for notification of slug discharges;

j) Other conditions as deemed appropriate by the Department to ensure compliance with these Regulations.

3.2.5 PUBLIC NOTICE OF PERMIT ISSUANCE

a) Public notice of every proposed wastewater discharge permit ("permit") shall be published by the Water Department in a newspaper of daily circulation within the geographical area of the discharge. The notice shall include at least the following:

1) Name and address of each permittee.
2) Each permittee's activity or operation which results in the discharge described in the wastewater discharge permit.
3) Address and phone number of premises where a copy of the propose permit may be requested.
4) Notice of the 30-day comment period required by section 3.2.5(b)

b) There shall be a 30-day period following publication of notice during which written comments may be submitted by the permittee or interest

persons located within the Water Department's wastewater processing service area. The Commissioner will make his final determination on a proposed permit following the comment period. The period for comment may be extended at the discretion of the Commissioner for up to 30 additional days.

c) The Commissioner shall issue the permit as soon as is practicable and this shall be a final decision.

3.2.6 PERMIT DURATION

a) Permits shall be issued for a specified time period, not to exceed five (5) years. A permit may be issued for a period less than a year or may be stated to expire on a specific date. The User shall apply for permit reissuance a minimum of 180 days prior to the expiration of the User's existing permit as set forth in Section 3.2.2. The terms and conditions of the permit may be subject to modification by the City during the term of the permit as limitations or requirements as identified in Section 2 are modified or other just cause exists. The User shall be informed of any proposed changes in his permit at least 30 days prior to the effective date of change. Any changes or new conditions in the permit shall include a reasonable time schedule for compliance.

b) Where a permit has been appealed, appeal shall only stay the disputed provision not the entire permit. The remainder of the permit is enforceable.

c) Where a permit has been issued under City of Philadelphia Wastewater Control Regulations, which became effective January 1, 1977, the per-

mit shall remain effective until the expiration date of the permit. The User shall apply for permit reissuance a minimum of 180 days prior to the expiration of the User's existing permit as set forth in Section 3.2.2.

3.2.7 PERMIT TRANSFER

Wastewater discharge permits are issued to a specific User for a specific operation. A wastewater discharge permit shall not be reassigned or transferred or sold to a new owner, new User, different premises, or a new or changed operation without the approval of the City. The User must give the Department at least 30 days notice of a transfer of ownership. Any succeeding owner or User shall also comply with the terms and conditions of the existing permit until a new permit for the succeeding owner of User is issued by City.

3.2.8 EFFECTIVE DATE

The permit becomes effective when signed by the Commissioner or his designate.

3.3 REPORTING REQUIREMENTS

3.3.1 COMPLIANCE DATE REPORT

Within 90 days following the date for final compliance with applicable Pretreatment Standards or, in the case of a New Source, following commencement of the introduction of wastewater into the POTW, any User subject to Pretreatment Standards and Requirements shall submit to the Commissioner a report indicating the nature and concentration of all pollutants in the

discharge from the regulated process which are limited by Pretreatment Standards and Requirements and the average and maximum daily flow for these process units in the User's facility which are limited by such Pretreatment Standards or Requirements. The report shall state whether the applicable Pretreatment Standards or Requirements are being met on a consistent basis and, if not, what additional O&M and/or pretreatment is necessary to bring the User into compliance with the applicable Pretreatment Standards or Requirements. This statement shall be signed by an authorized representative of the Industrial User.

3.3.2 PERIODIC COMPLIANCE REPORTS

(a) Any User subject to a Pretreatment Standard, shall submit to the Department during the months of June and December, unless required more frequently or in different months in the Pretreatment Standard or by the Water Department, a report indicating the nature and concentration of pollutants in the effluent which are limited by such Pretreatment Standards.

(b) The Department may impose mass limitations on Users which are using dilution to meet applicable Pretreatment Standards or Requirements, or in other cases where the imposition of mass limitations are appropriate. In such cases, the report required by subparagraph (1) of this paragraph shall indicate the mass of pollutants regulated by Pretreatment Standards in the effluent of the User. These reports shall contain the results of sampling and analysis of the discharge, including the flow and the nature and concentration, or production and mass where requested by the Department, of pollutants contained therein

which are limited by the applicable Pretreatment Standards. The frequency of monitoring shall be prescribed in the applicable Pretreatment Standard by the Department. All analysis shall be performed in accordance with procedures established by the EPA pursuant to section 304(g) of the Act and contained in 40 CFR, Part 136, and amendments thereto, or with any other test procedures approved by the EPA. Sampling shall be performed in accordance with the techniques approved by the EPA. Where 40 CFR, Part 136 does not include a sampling or analytical technique for the pollutant in question, sampling and analysis shall be performed in accordance with the procedures set forth in the EPA publication, Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants, April, 1977, and amendments thereto, or with any other sampling and analytical procedures approved by EPA.

3.4 MONITORING FACILITIES

a) The City shall require to be provided and operated at the User's own expense, monitoring facilities to allow inspection, sampling, and flow measurement of the building sewer and/or internal drainage systems. The monitoring facility should normally be situated on the User's premises, but the City may, when such a location would be impractical or cause undue hardship on the User, allow the facility to be constructed in the public street or sidewalk area and located so that it will not be obstructed by landscaping or parked vehicles.

b) There shall be ample room in or near such sampling manhole or facility to allow accurate sampling and preparation of samples for analysis. The faci

lity, sampling and measuring equipment shall be maintained at all times in a safe and proper operating condition at the expense of the User.

c) Whether constructed on public or private property, the sampling and monitoring facilities shall be provided in accordance with the City's requirements and all applicable local construction standards and specifications. Construction shall be completed within 90 days following written notification by the City.

3.5 INSPECTION AND SAMPLING

a) The City shall inspect the facilities of any User to ascertain whether the purpose of these regulations are being met and all requirements are being complied with. Persons or occupants of premises where wastewater is created or discharged shall allow the City or their representative ready access at all reasonable times to all parts of the premises for the purposes of inspection, sampling, records examination, copying of records or for the performance of any of their duties.

b) The City shall have the right to set up on the User's property such devices as are necessary to conduct sampling, inspection, compliance monitoring and/or metering operations.

c) Where a User has security measures in force which would require proper identification and clearance before entry into their premises, the User shall make necessary arrangements with their security guards so that upon presentation of suitable identification, personnel from the City shall be permitted to enter, without delay, for the purposes of performing their specific responsibilities.

3.6 PRETREATMENT

Users shall provide necessary wastewater treatment as required to comply with these regulations and shall achieve compliance with all Federal Categorical Pretreatment Standards within the time limitations as specified by the Federal Pretreatment Regulations. Any facilities required to pretreat wastewater to a level acceptable to the City shall be provided, operated, and maintained at the User's expense. Detailed plans showing the pretreatment facilities and operating procedures shall be submitted to the City for review, and shall be acceptable to the City before construction of the facility. The review of such plans and operating procedures will in no way relieve the User from the responsibilty of modifying the facility as necessary to produce an effluent acceptabl to the City under the provisions of these regulations. User shall report to the City any changes in the pretreatment facilities, method of operation or nature or characteristics of the wastewater. City may deny or condition any changes i the nature or characteristics of the wastewater at least sixty (60) days prior to such changes.

All User records relating to compliance with Pretreatment Standards shall be made available to City for inspection and copying.

3.7 CONFIDENTIAL INFORMATION

a) Information and data on a User obtained from reports, questionnaires, perm applications, permits and monitoring programs and from inspections shall b available to the public or other governmental agency without restriction unless the User specifically requests and is able to demonstrate to the satisfaction of the City that the release of such information would divulg information, processes or methods of production entitled to protection as trade secrets of the User.

b) When requested by the person furnishing a report, the portions of a report which might disclose trade secrets or secret processes shall not be made available for inspection by the public but shall be made available upon written request by governmental agencies for uses related to this regulation, the City's National Pollutant Discharge Elimination System (NPDES) Permit, State Disposal System permit and/or the Pretreatment Programs; provided, however, that such portions of a report shall be available for use by State and Federal government or any state or federal agency in judicial review or enforcement proceedings involving the person furnishing the report. Wastewater constituents and characteristics will not be recognized as confidential information.

3.8 PUBLIC NOTIFICATION

The City shall publish, at least semi-annually in the daily newspaper with the largest circulation a list of the Users which were not in compliance with any Pretreatment Requirements or Standards during the six previous months. The notification may also summarize any enforcement actions taken against the User(s) during the same six months.

3.9 CERTIFICATION REQUIREMENT

Baseline monitoring reports, reports on compliance with categorical pretreatment standards and periodic reports on continued compliance shall include the certification statement set forth in 40 CFR 403.6(a)(2)(ii).

3.10 SIGNATORY REQUIREMENT

Baseline monitoring reports, reports on compliance with categorical pretreatment standards and periodic reports on continued compliance shall be signed as specified in 40 CFR §403.12(l).

SECTION 4 - ENFORCEMENT

4.1 EMERGENCY SUSPENSIONS

a) Notwithstanding any other provisions of these regulations, the City may suspend the wastewater treatment service and/or a wastewater discharge permit when such suspension is necessary, in the opinion of the City, in order to stop an actual or threatened discharge which:

(1) presents or may present an imminent or substantial endangerment to the health or welfare of persons; or

(2) presents or may present an imminent or substantial endangerment to the environment; or

(3) may cause or actually causes Interference to the POTW; or

(4) causes the City to violate any condition of its NPDES Permit.

b) Any person notified of a suspension of the wastewater treatment service and/or the wastewater discharge permit shall immediately stop or eliminate all contributions.

c) Should the person fail to immediately comply voluntarily with the suspens order, the City shall take such steps as deemed necessary, including but n limited to termination of water service, and/or immediate severance of th sewer connection, to prevent or minimize damage to the POTW system, its receiving stream or endangerment to any individuals.

d) The City shall reinstate the wastewater discharge permit and/or the wastewater treatment service upon proof of the elimination of the non-complying discharge.

e) A detailed written statement submitted by the User describing the causes of the harmful contribution and the measures taken to prevent any future occurrence shall be submitted to the City within 15 days of the date of occurrence.

4.2 REVOCATION OF PERMIT

Any User who violates these regulations, the Wastewater Discharge permit, or any applicable Federal, State or local law, is subject to having his wastewater discharge permit revoked in accordance with the procedures of Section 4.3 of these regulations. Revocation of a User's Permit requires the User to immediately cease all wastewater contributions.

4.3 PROCEDURE FOR REVOCATION OF PERMIT

a) Whenever the City finds that any User has violated or is violating these regulations, the wastewater discharge permit, or any prohibition, limitation, or requirement contained herein, the City may serve by regular or certified mail upon such person a written notice stating the nature of the violation. Notice by regular mail alone shall be deemed sufficient notice.

b) Within 30 days of the date of the notice of violation the User must respond in writing. The response must state why the violation occurred, the steps taken to prevent its reoccurrence, and whether the violation has been corrected. If the User is unable to correct the violation within thirty (30) days his response must include a plan for the satisfactory correction thereof.

c) The Commissioner shall consider the User's response, if any, before rendering his final determination order. The Commissioner's final determination order may direct that:

(1) the User's Permit be immediately revoked;

(2) the User's Permit be revoked on a specified future date unless adequate treatment facilities, devices or other related appurtenance shall have been installed and existing treatment facilities, devices or other related appurtenances are properly operated; or

(3) the User's Permit shall continue in effect.

d) Further orders and directives as are necessary and appropriate may be issued.

4.4 ENFORCEMENT OF PERMIT REVOCATION

If the User fails to immediately cease all wastewater discharges upon the revocation of his wastewater discharge permit, the Commissioner may order any of the following actions to be taken:

a) immediate termination of the User's water service;
b) immediate severance of the User's sewer connection;
c) any other action designed to immediately terminate the User's wastewater discharge.

4.5 REISSUANCE OF PERMIT AFTER REVOCATION

a) Where an Industrial User has failed to comply with the provisions of these regulations or any order or previous permit issued hereunder, the City may decline to reissue a Permit.

b) A User must submit to the City a plan to comply with the provisions of these regulations or any order or previous permit issued hereunder. At t

very least the plan must outline (1) what will be done to comply; (2) what has been done to comply and (3) what time frame will be required to comply.

c) Prior to issuing a Permit the City may require the User to:

1) file with the City a performance bond payable to the City, in a sum not to exceed a value determined by the City to be necessary to achieve consistent compliance; or

2) submit proof that it has obtained liability insurance acceptable to the City, sufficient to restore or repair the POTW for damages that may be caused by the User's discharge.

4.6 ENFORCEMENT PROCEDURE AGAINST NON PERMITTED USERS

a) Whenever the City finds that any User has violated or is violating these regulations, or any prohibition, limitation, or requirements contained herein, the City may serve by regular or certified mail upon such person a written notice stating the nature of the violation. Notice by regular mail shall be deemed sufficient notice.

b) Within 30 days of the date of the notice of violation the User must respond in writing. If the User is unable to correct the violation within thirty (30) days his response should include a plan for the satisfactory correction thereof.

c) The Commissioner shall consider the User's response, if any, before rendering his final determination order. The Commissioner's final determination order may direct that:

(1) the User immediately cease all wastewater contributions; or

(2) the User be prohibited from contributing wastewater into the City's system unless adequate treatment facilities are installed and operating; or

(3) the User may continue his wastewater contribution.

d) Further orders and directives as are necessary and appropriate may be issue

e) If a User fails to immediately comply with the Commissioner's final determination order the Commissioner may enforce his order by taking any or all of the actions stated in Section 4.4. In addition, the Commissioner may use any other administrative, legal, or equitable relief available.

f) After termination, the User may apply to the Commissioner to once again contribute wastewater into the City's system. The Commissioner may accept, deny, or condition his acceptance of the application pursuant to Section 4.5.

4.7 LEGAL ACTION

If any person discharges sewage, industrial wastes, or other wastes into the City's wastewater disposal system or commits nondischarge violations including but not limited to failure to submit reports or allow onsite inspections contrary to the provisions of these regulations, Federal or State Pretreatment Requirements, the permit, or any order of the City, the City Solicitor may commence an action for appropriate legal and/or equitable relief in the appropria Court.

4.8 INJUNCTIVE RELIEF

Whenever an Industrial User has violated or continues to violate the provision of these regulations or permit or order issued hereunder, the City, through

counsel may petition the Court for the issuance of a temporary restraining order, a preliminary or permanent injunction (as may be appropriate) which restrains or compels the activities on the part of the Industrial User.

4.9 CEASE AND DESIST ORDERS

When the City finds that an Industrial User has violated or continues to violate these Regulations or any permit or order issued hereunder, the City may issue an order to cease and desist all such violations and direct those persons in non-compliance to:

a) Comply forthwith.

b) Take such appropriate remedial or preventive action as may be needed to properly address a continuing or threatened violation, including halting operations and terminating the discharge.

4.10 WATER SUPPLY SEVERANCE

Whenever an Industrial User has violated or continues to violate the provisions of these regulations or an order or permit issued hereunder, water service to the Industrial User may be severed and service will only recommence, at the User's expense, after it has satisfactorily demonstrated its ability to comply.

SECTION 5 - FEES

5.1 PURPOSE

It is the purpose of this section to provide for the recovery of costs from users of the City's wastewater disposal system for the implementation of the program established herein.

5.2 CHARGES AND FEES

1. All industrial users applying for or issued a permit after the promulgation of these regulations shall pay a fee of $500.00 per permit application.

2. The City may adopt charges and fees which may include:

   a) fees for reimbursement of costs of setting up and operating the City's pretreatment Program;

   b) fees for monitoring, inspections and surveillance procedures;

   c) fees for reviewing accidental discharrge procedures and construction;

   d) other fees as the City may deem necessary to carry out the requirements contained herein.

These fees relate solely to the matters covered by these regulations are are separate from all other fees chargeable by the City. The Department reserves the right to change the fees set forth herein.

SECTION 6 - PENALTY: COSTS

6.1 CIVIL PENALTIES

Any user who is found to have violated, continues to violate, or fails to compl with an Order of the Commissioner or any provision of these regulations, and th orders, rules, regulations and permits issued hereunder shall be liable to the City for a civil penalty of Three Hundred Dollars ($300.00) or the maximum fine allowed by law for each offense plus actual damages incurred by the City per violation per day, for as long as the violation continues. Each day o which a violation shall occur or continue shall be deemed a separate and

distinct offense; each term, condition or parameter violated snall also be deemed a separate and distinct offense. In addition to the penalties and damages provided herein, the City may recover reasonable attorneys' fees, court costs, court reporters' fees and other expenses associated with the enforcement activities, including sampling and monitoring expenses, against the person found to have violated these regulations or the orders, rules, regulations, and permits issued hereunder.

6.2 FALSIFYING INFORMATION

Any person who knowingly makes any false statements, representation or certification in any application, record, report, plan or other document filed or required to be maintained pursuant to these regulations, or any wastewater discharge permit, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under these regulations shall, upon conviction, be punished by a fine of $300 or the maximum fine allowed by law or by imprisonment for not more than six (6) months, or by both.

SECTION 7 - SEVERABILITY

If any provision, paragraph, word, section or article of these Regulations is invalidated by any court of competent jurisdiction, the remaining provisions, paragraphs, words, sections, and chapter shall not be affected and shall continue in full force and effect.

SECTION 8 - CONFLICT

All other regulations and parts of other regulations inconsistent or conflicting with any part of these regulations are hereby repealed to the extent of such inconsistency or conflict.

SECTION 9 - EFFECT OF REGULATIONS

These regulations shall apply to the City and to persons outside the City who are, by contract or agreement with the City, Users of the City's wastewater system.

SECTION 10 - EFFECTIVE DATE OF REGULATIONS

These regulations shall be effective June 11, 1990 .

Date: May 11, 1990

JOHN PLONSKI
Water Commissioner

Approved as to form:

CAROL HORNE PENN
Assistant City Solicitor

/rh
IWORD

APPENDIX B

Sample Intermunicipal Agreements

Sample Short-Term Agreeement

This Agreement, made this 10th day of May, 1983, A.D. by and between the City of Philadelphia, party of the first part, hereinafter called "City" and the Township of Abington, Montgomery County, Pennsylvania, party of the second part, hereinafter called "Township."

WITNESSETH:

WHEREAS, The City owns and operates wastewater collection and treatment facilities which have a limited capacity to convey, scientifically treat and properly dispose of wastewater and its by-products collected from outlying municipalities in addition to wastewater originating within the City; and,

WHEREAS, Expansion of the City's wastewater treatment facilities will enable the City to accommodate additional flows of wastewater; and,

WHEREAS, It is necessary to comply with new higher standards and treatment methods for wastewater as set forth in Federal, State and local laws and regulations; and,

WHEREAS, There are resultant by-products in the form of sludge in connection with all methods of wastewater treatment which must be disposed of; and,

WHEREAS, the City is now expanding and improving its wastewater collection and treatment facilities in accordance with orders, guidelines and regulations of the the Delaware River Basin Commission, the Pennsylvania Department of Environmental Resources and the United States Environmental Protection Agency (hereinafter referred to as "EPA"); and,

WHEREAS, The City has entered into Federal Grant Agreements with the EPA under the Funding Arrangements provided in Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) as amended by the Clean Water Act of 1977 (P.L.

95-217), for the purpose of partially funding the expansion, improvement and rehabilitation of the City's wastewater collection and treatment system; and,

WHEREAS, The City has grant applications pending and expects to apply to the EPA for additional grants in the future for the purpose of partially funding the expansion, upgrading and/or rehabilitation of the City's wastewater collection and treatment system; and,

WHEREAS, The City is required to adhere to and abide by all Federal, State and local laws and EPA Rules and Regulations in order to retain Federal grant funding; and,

WHEREAS, There are in existence an Agreement or Amendments (hereinafter referred to solely as "Agreements") by and between the City and Township through which the City has provided wastewater collection and treatment and sludge disposal services to Township; and,

WHEREAS, Said Federal Rules and Regulations apply to the entire Delaware and Schuylkill River tributary drainage areas which include the Township's area served by the City's wastewater collection and treatment system; and,

WHEREAS, In order to comply with Federal, State and local laws and regulations and EPA Rules and Regulations, the City and Township must conduct a sewer system evaluation survey and rehabilitation as required by EPA regulations and other applicable laws and also must implement a User Charge System and must coordinate with the City in their Pretreatment Program implementation of a Federal Facilities Cost Recovery Plan as required by EPA Regulations and Memoranda; and,

WHEREAS, When Township is in compliance as set forth above, it may be eligible for reimbursement under the City's existing and future Grant Agreements for certain authorized eligible costs incurred by it for the said compliance; and,

WHEREAS, The City and Township have now been charged by Federal and State mandates with the legal responsibility to restore and maintain the chemical, physical and biological integrity of our waters and water resources, and also to insure that to the fullest extent possible they prevent, reduce and eliminate pollution in said water resources, and to plan the development and use (including restoration, preservation and enhancement) of said waters and water resources, and to improve the purity of such waters; and,

WHEREAS, The aforesaid conditions could not have been foreseen by the parties when the existing Agreements were originally executed and/or amended. Further, the aforesaid improvements and expansion of the City's present wastewater treatment facilities conditions are caused by Federal pollution control legislation, State and local government regulations and requirements. Further, changes in the population density, increases in the cost of money and increases in the cost of operating wastewater treatment plants have exacerbated this problem. The foregoing circumstances have caused extreme increases in the expense and changes in performance of Agreements by the City and have added restrictions and responsibilities upon both the City and Township in regard to methods of wastewater collection and treatment and sludge disposal; and,

WHEREAS, The provisions and conditions either stated or implied in the existing Agreements do not reflect the current fair share of costs which ought to be allocated to and borne by Township for the construction, operation and maintenance of the City's wastewater treatment facilities, which has caused the City to subsidize that portion of the deficit resulting from improved treatment of the wastewater collected from Township, and has caused unreasonable increases in rates upon other users; and,

WHEREAS, Performance of said existing Agreements is rendered impossible by the said laws and changes and it is necessary to empower the City to enter into

new agreements to insure the proper restoration and efficient maintenance of the chemical, physical and biological integrity of our waters and waterways, and improve, restore, preserve and enhance the purity of such waters and waterways, and insure that applicable Federal, State and local laws and regulations, and EPA Rules and Regulations, are implemented in portions of any waterway tributary to the City's wastewater facilities, to determine fair and equitable cost and charge provisions to meet current and future conditions, and to supercede, repeal, revise and replace the above-mentioned existing Agreements in order to comply with present laws and regulations in this said new Agreement;

NOW, THEREFORE, It is mutually covenanted and agreed by and between the parties hereto as follows:

Except for services rendered and unpaid under existing Agreements, the City and Township hereby concurrently release one another from any and all rights, privileges, responsibilities or liabilities, either stated or implied in all Agreements by and between the City and Township for wastewater collection and treatment and sludge disposal, and hereby covenant and agree to enter into a new Agreement for wastewater collection and treatment and sludge disposal. Said Agreement shall be as follows:

clean slate

ARTICLE 1

GOVERNMENT GRANTS, SUBSIDIES, PERMITS AND RELATED MATTERS

1.01. Applications

The City may make application in conjunction with the Township to the Commonwealth of Pennsylvania and to the United States of America and their

appropriate agencies for grants, subsidies or other payments, and for all permits and approvals with respect to the planning, design, acquisition, construction, operation and maintenance of the expansion of the City's water pollution control facilities. Further, the City may receive the proportionate share of Township's grants, subsidies or other payments with respect to the construction, acquisition, operation and maintenance of the City's water pollution control plants and appurtenant facilities. The Township shall cooperate fully therein, to the extent of their respective interests in such individual projects.

1.02. Application of Grant Proceeds

After receipt by the City, the City shall within thirty (30) days reimburse to Township the maximum allowable percentage of all authorized costs incurred by Township in compliance with the provisions of this Agreement as provided for under existing applicable laws and grant agreements and deemed eligible by EPA for reimbursement under such existing laws and grant agreements.

All funds received by Township from the City's existing and future Federal grant agreements are subject to Federal and City audit as to authenticity and eligibility of claims as required by laws and regulations.

Any action by the City that may jeopardize or delay the reimbursement by EPA of any grant proceeds attributable, in whole or in part, to costs incurred by the Township in compliance with the provisions of this Agreement shall be deemed a violation. This violation shall be rectified by the City within ninety (90) days. If after ninety (90) days, the City has not rectified the violation, the City shall pay the Township a penalty equal to one and one-quarter percent (1¼) per month of the unpaid grant proceeds. Anything in this paragraph to the contrary notwithstanding, the City shall not be obligated to pay any penalty on

delayed reimbursement to the Township that results from any action taken by the City to determine its legal rights under federal or state water pollution laws.

1.03. Compliance with Laws and Regulations

The City and Township shall comply with all applicable Federal, State and local laws and regulations as well as all EPA Rules and Regulations either now in existence or as may be imposed in the future. Township further agrees to provide any reports, data, surveys or studies required by the City and/or appropriate Federal and State agencies. The City agrees to provide any existing reports, data, surveys or studies needed by the Township to fulfill the requirement of this Agreement. This may include, but not be limited to, data for construction grant requirements, National Pollutant Discharge Elimination System requirements, Sludge Disposal Permit requirements and industrial pretreatment requirements. The cost of such reports, data, surveys or studies is to be reimbursed to Township by the City to the extent of the funds obtained from Federal or State agencies for that purpose.

1.04 Compliance with Regulations and Laws

In order to comply with Federal, State and local laws and regulations and EPA Regulations and other applicable law:

(a) The City shall establish a system of charges to be applied to quantity and quality of wastewater which represents Township's share of the costs of providing the wastewater collection and treatment, and sludge disposal services by the City to Township.

(b) In cooperation with the City, Township shall develop, adopt, implement and maintain a User Charge System which properly distributes the cost of serving each user or class of users in compliance with applicable

User charges

law and EPA Regulations. Township shall provide evidence as required by all Federal and State regulatory bodies of the timely development of its User Charge System. Upon initiation of the User Charge System, Township shall maintain such current records as are necessary to document continued user compliance. These records are to be available for periodic examination by the City by mutual arrangement.

(c) If required by EPA, Township agrees to develop, adopt, and implement a system for the collection, metering, sampling, retention and payment of the Industrial Cost Recovery Charges in compliance with EPA Rules and Regulations and other applicable laws; and Township shall provide evidence as required by all regulatory bodies, as well as the City, of the timely development of its Industrial Cost Recovery System. Upon initiation of the Industrial Cost Recovery System, Township shall maintain such records as are necessary to demonstrate continued compliance. Such records are to be available for inspection by the City when requested.

(d) Township, shall conduct a Sewer System Evaluation Analysis and Rehabilitation Program in compliance with EPA Rules and Regulations .

(e) Township shall coordinate with the City the implementation of a Federal Facilities Cost Recovery Plan as required by EPA Regulations and Guidance Memoranda to recover those project costs allocated to the treatment of wastes from major activities of the Federal Government within Township, where applicable.

(f) Failure by Township to comply with any of the terms and conditions of the above provisions which may jeopardize EPA's approval or continuation of an existing or future grant agreement between the City and EPA shall, at the discretion of the City Water Commissioner, be deemed a violation of the above provisions. The City retains the right to terminate

in part or in whole any or all wastewater services between Township and the City as a result of violations of the above provisions; provided, however, that the City shall first give Township ninety (90) days notice in writing, by certified mail, of the violation or violations. If the Township cures the violation(s) within the ninety (90) days notice period, the Agreement shall continue in affect.

(g) All costs or penalties incurred by the City because of termination and/or restoration of any and all wastewater services between the City and Township as a result of violations of the above provisions shall be payable to the City by Township within one hundred eighty (180) days of such billing by the City. Penalties shall be added to the unpaid balance thereafter at the rate of one and one-quarter percent (1¼%) per month.

ARTICLE 2

WASTEWATER CHARGES AND PAYMENTS

2.01. Wastewater Service

(a) Township shall pay quarterly to the City a Wastewater Service Charge for the conveyance, treatment and disposal of its wastewater delivered to the City. The Wastewater Service Charge shall be determined in accordance with past and estimated future costs of conveying and treating wastewater and disposing of resultant sludge and shall include charges applicable in part to quantity and quality of the wastewater flow delivered by Township and in part to contractual capacities as set forth in Article 3, Section 3.02, as well as the attached Addendum. Said wastewater charges shall include but not be limited to: (1) depreciation and return on facilities; (2) costs of operation, maintenance, repairs, replacements and

removals of the City's conveyance and treatment facilities; and, (3) appropriate shares of employee benefits, departmental overhead and other non-direct expenses.

(b) Wastewater Service Charges by the City shall be reviewed no less frequently than biennially, and said Wastewater Service Charges may be increased or decreased, if necessary.

(c) The City will render billings to Township on a quarterly basis. Any lump sum charges shall be pro-rated over the four quarters of the year. These billings shall be based upon actual quantity and quality and/or contractual capacities or, when necessary, upon estimates thereof.

(d) Billings shall be payable to the City by Township within thirty (30) days. Penalties shall be added to the unpaid balance thereafter, at a rate of one and one quarter percent (1¼%) per month.

(e) The City shall provide notice to Township of any change in rates at least ninety (90) days in advance of their becoming effective.

(f) City wastewater charges for the conveyance, treatment and disposal of wastewater received from Township shall become effective July 1, 1981.

ARTICLE 3

CONSTRUCTION, OPERATION AND MAINTENACE OF TOWNSHIP'S CONVEYANCE SYSTEM AND RELATED MATTERS

3.01. Design and Construction

Township shall design, construct, own, operate and repair at its sole cost and expense sanitary sewers and connections to the City system necessary to convey its wastewater to the City. The locations of approved points of connect-

ion and provisions concerning these connections are described in the Addendum attached hereto and made a part hereof.

No additional points of connection shall be made without prior written approval from the City Water Commissioner. If certain of Township's connections are determined by the City or any governmental regulatory agency to be maintenance problems or sources of unauthorized discharges caused by the Township or any of its users, the City shall have the right to notify Township that such connection must be disconnected and relocated and Township shall do so forthwith, at the sole expense of Township.

3.02. Allowable Quantities

The City shall also have the right to establish quantities, qualities and flow rates of wastewater received from Township, specific details of which are included in the attached Addendum. In the event that Township exceeds the quantities, qualities or flow rates set forth in the attached Addendum, the City shall have the right to impose any sanctions as set forth in Sections 1.04(f) and (g) as well as any other provision of this Agreement pertaining to wastewater charges and penalties.

3.03. Metering and Sampling

Plans and specifications for a chamber or chambers for metering and sampling shall be submitted to the City by Township for approval. Upon approval by the City, such chamber or chambers may be placed at each point of connection to the City system.

(a) Chambers shall include approved meters for measurements of wastewater quantities, and telemetry equipment for transmitting flow data to a regional control center in the City. Chambers shall also be equipped with automatic sampling equipment.

(b) The City shall install all chambers and equipment at the sole cost of the Township.

(c) The City shall:

1. Record periodically the meter readings of watewater flowing through said meters;

2. Periodically take wastewater samples for analyses; and,

2. (a) The City shall notify the Township prior to sampling the Township's wastewater and reading the flow meters or measuring flow attributable to the Township. The Township shall have the option of accompanying the City and splitting samples. If the Township does not exercise this option, it shall be bound by the City's results.

3. Perform the analysis of samples according to standard methods as prescribed in the current edition of "Standard Methods for the Examination of Water and Wastewater," published by American Public Health Association, and subject to the provisions of this section, the City's findings in such analysis shall be binding on both parties to this Agreement.

(d) Send flow data utilized in the billing to Township with each billing.

The City will own all the aforesaid equipment, wherever located, and will inspect, calibrate, maintain and repair such meters and devices as part of its operating costs.

Subject to the provisions of this section, the City shall estimate flow and quality conditions when accurate records are unavailable for any reason whatsoever.

The City shall have the option of approving Township's schedule for the installation of such equipment. Township shall have a right to inspect meters and check calibration.

ARTICLE 4

EXPANSION, OPERATION AND MAINTENANCE OF CITY PLANTS AND RELATED MATTERS

4.01. Design, Construction, Operation and Maintenance of Water Pollution Control Plants

The City will plan, design, and construct the expansion of City water pollution control plants and appurtenances and will thereafter operate, maintain, repair and improve such expanded plants pursuant to the guidelines of, and with the cooperation of, the Delaware River Basin Commission, the Pennsylvania Department of Environmental Resources and the United States Environmental Protection Agency and other responsible governmental agencies.

ARTICLE 5

FUTURE SERVICE REQUIREMENTS, FUTURE EXPANSION AND RELATED MATTERS

5.01 Future Service Requirements and Related Matters

The City and Township shall, from time to time, review system performance and the City's and Township's current and future requirements, both in terms of additional future flows of wastewater and higher standards of wastewater treatment and disposal. Township shall:

(a) pay its proportionate share of the total project costs of such expansion; and,

(b) assist in the financing of such project costs.

ARTICLE 6

WASTEWATER QUALITY RESTRICTIONS

6.01. Uniform Standards

Township shall adopt rules, regulations and resolutions governing sewer connections and the admission of wastewater into the sewers of Township which shall bar from the sewers of Township such substances as are barred by the City from its sewers according to the Federal, State and local laws and regulations and EPA Rules and Regulations existent or adopted in the future.

Township agrees to submit documentation to demonstrate enforcement and compliance with all appropriate rules and regulations and resolutions to the City pursuant to the City's National Pollutant Discharge Elimination System Permits and/or Sludge Disposal Permits.

6.02. Damages Due to Barred or Harmful Substances

Any costs or damages incurred by the City as a result of Township's facilities not complying with Article 6, Section 6.01 shall be billed to Township and shall be paid to the City by Township within thirty (30) days of such billing by the City. Penalties shall be added to the unpaid balance thereafter, at the rate of one and one-quarter percent (1¼%) per month.

ARTICLE 7

SLUDGE DISPOSAL

7.01. Utilization of Wastewater Sludge Generated by City Facilities

Township recognizes the importance and urgent need to utilize sludge in a timely and proper manner. Township shall use its best efforts to cooperate fully with City in any environmentally sound sludge utilization program involving Abington's proportionate share of sewage sludge, which meets Federal and State standards within area served by Township.

ARTICLE 8

MISCELLANEOUS

8.01. Inspection and Audit

Complete records and accounts relating to each party's responsibilities under this Agreement shall be kept. Each party shall at all times have the right to examine and inspect said records and accounts and their physical facilities.

If required by any law or regulation, Township shall make said records and accounts available to Federal and State grant auditors.

8.02. Arbitration of Dispute

If any dispute shall arise between the parties hereto, touching the terms, conditions and covenants of this Agreement, the same shall be submitted to a Board of Arbitration. The Board of Arbitration shall be composed of three (3) arbitrators, one appointed by the Water Commissioner, one by Township, and the third to be agreed upon jointly by the arbitrators selected by the Water Commissioner and Township.

The arbitrators representing Township and the City shall be named within five (5) days from the request for the appointment of such Board. If after a period of ten (10) days from the date of the appointment, the two (2) arbitrators appointed by the City and Township cannot agree on the third arbitrator, then either appointed arbitrator may request the American Arbitration Association or its successor in function to furnish a list of three (3) members of said Association who are residents of Pennsylvania from which the third arbitrator shall be selected.

The arbitrator appointed by the Township shall then eliminate one (1) name from the list furnished by the American Arbitration Association within five (5) days after its publication, following which the arbitrator appointed by the City

shall eliminate one (1) name from the list within five (5) days thereafter. The individual whose name remains on the list shall be the third arbitrator and shall act as the Chairman of the Board of Arbitrators.

The Board of Arbitrators, thus established, shall commence the arbitration proceedings within ten (10) days after the third arbitrator is selected and shall make its determination within thirty (30) days after the appointment of the third arbitrator. The decision of such arbitrators shall be final and binding upon the parties.

8.03. Claims, Insurance and Related Matters

1. Township agrees to defend and/or join in defending and also indemnify the City and save it harmless from and against all claims, actions, causes, suits, demands, losses, interest, penalties and liabilities pursuant to performance of this Agreement by reason of:

(a) The City's inability, due to causes beyond its control, to perform any of the provisions of this Agreement;

(b) Injury (including death) to persons and damages to property resulting from any operations under this Agreement, whether due to the negligence of the City, Township, its employees, servants or the inherent nature of said operations;

(c) EPA or Pennsylvania Department of Environmental Resources action of any kind whatsoever, direct or indirect, for any work undertaken by Township, its contractors or consultants, necessary and required by this Agreement due to rejection of said work by the EPA or Pennsylvania Department of Environmental Resources;

(d) Any grant fund, or any portion thereof, received by Township and later determined to be ineligible for reimbursement by the appropriate regulatory agency or grant auditors.

2. Nothing hereinabove set forth shall limit or debar the City from resorting to any appropriate remedy in law or equity, or any combination of remedies for non-compliance with Section 8.03 of this Agreement.

8.04. No Transfer of Rights

No provisions of this Agreement shall be deemed to:

1. Confer upon any third person any right against Township or the City or to authorize any such third person to institute any suit against Township or the City.

2. Permit or authorize Township to confer, transfer, convey, assign, or license any third party any rights obtained under this Agreement.

8.05. Term.

This Agreement shall become effective immediately and shall continue in force and effect for seven (7) years commencing on the date hereof and shall thereafter continue until termination by either of the parties hereto giving the other at least six (6) months written notice of its intention to do so.

8.06. No Joint Ownership

No provision of the Agreement shall be construed to create any type of joint ownership of any property, any partnership or joint venture, or create any other rights or liabilities except as expressly set forth herein.

8.07. Severability

Should any provision hereof for any reason be held illegal or invalid, no other provision of this Agreement shall be affected; and this Agreement shall then continue in full force as if such illegal or invalid provision had not been contained herein.

8.08. Successors and Assigns

Except as set forth in Section 8.04, all the covenants contained in this Agreement shall extend to and bind the respective successors and assigns of the

parties hereto with the same effect as if the words "successors and assigns" had, in each case, been specifically mentioned.

8.09. Waiver

The failure of a party hereto to insist upon strict performance of this Agreement or of any of the terms or conditions hereof shall not be construed as a waiver of any of its rights herein granted.

ARTICLE 9

9.01. Addendum

Notwithstanding anything herein contained to the contrary, it is further understood and agreed that Addendum No. 1 attached hereto is hereby incorporated by reference as though fully set forth herein.

IN WITNESS WHEREOF, The City of Philadelphia has caused this Agreement to be executed by its Water Commissioner pursuant to an Ordinance; and the appropriate officers of the Township of Abington have executed this Agreement on behalf of the Township, and have hereunto affixed the corporate seal of the said

Township duly attested by the appropriate officer thereof, the day and year first above written.

CITY OF PHILADELPHIA

By: _____
WILLIAM J. MARRAZZO
Water Commissioner

Approved as to form:
MARK A. ARONCHICK
Acting City Solicitor

By: _____
MARTHA W. BUSH
Deputy City Solicitor

By: _____
TOWNSHIP OF ABINGTON President

Attest:

_____
Secretary

May 10, 1983

ADDENDUM NO. 1.

Township of Abington, County of Montgomery, Commonwealth of Pennsylvania

Notwithstanding anything contained herein to the contrary, this Addendum is made part of this Agreement between the City of Philadelphia and the Township of Abington, County of Montgomery, Commonwealth of Pennsylvania.

1. Points of connection of the City Wastewater System and maximum flow capacities are shown on a plan titled "Comprehensive Plan for Sanitary Sewer System Abington Township, Montgomery County, Pa.," attached hereto and marked Exhibit 1.

2. The Township Engineer and the Water Commissioner shall jointly have the right to revise the above mentioned plan as to points of connection and quantity of wastewater at various points of connection. Provided, however, that the total maximum flow of nine and two hundred forty-seven thousandths cubic feet per second (9.247 cfs) and the total flow of four million four hundred fifty-three thousand gallons per twenty-four hour day (4.453 mgd) to be received by the City from the Township are not exceeded.

3. In accordance with item 2 above maximum flow capacity to be permitted at connection P-11 (Pine and Kingfield Roads) shall be revised to 0.602 cubic feet per second.

4. The drainage area covered by this Agreement shall be from the area of the watershed of the Pennypack Creek in the Township of Abington, the Borough of Rockledge and a portion of the Tacony Creek watershed in the Borough of Rockledge, and the Abington portion of the Tacony Creek watershed adjoining the Borough of Rockledge.

5. Township's sanitary sewer in the Township in Fox Chase Road and Shady Lane extending approximately fifteen hundred feet to the Philadelphia-Montgomery County Line shall continue to convey wastewater from the City and retain a capacity not to exceed 0.185 cubic feet per second in said sewer as to convey wastewater from the City in the watershed draining to this sewer.

6. City's sanitary sewer in the Township beginning near the Philadelphia-Montgomery Line near Strahle Street and extending northwardly approximately one thousand feet generally parallel with the Philadelphia, Newtown and New York Railroad to a junction with Township's sanitary sewer in Shady Lane shall continue to convey wastewater from the City and retain a capacity not to exceed 0.185 cubic feet per second in said sewer as to convey wastewater from the City in the watershed draining this sewer.

7. The City shall indemnify and save harmless the Township from any and all claims by reason of the inability of the Township to receive and convey wastewater from the City. City further shall indemnify and save harmless the Township from any and all claims for injuries (including death) to persons or damage to property arising out of any sewer construction work undertaken by the City or its contractors within the limits of the Township.

8. This Agreement shall be amended as to areas and quantities of wastewater as the need arises for serving additional areas of the Pennypack Creek watershed beyond the limits of the Township of Abington and the Borough of Rockledge.

9. Provisions relating to connections to the City's wastewater system at Pine Road and Lee Lynn Lane and at Pine Road and Buckley Drive only.

It is agreed that the terms of section 3.03 of the attached agreement shall be waived, except for subsection (c), to allow the Township to design, construct and maintain, subject to City approval, the chambers at Pine Road and Lee Lynn Lane and at Pine Road and Buckley Drive. In order to permit the billing of wastewater flows township shall supply to the City, each year during the first week in January, a listing of the number of houses and of apartment units in the area(s) contributing wastewater through the two above noted chambers. For houses, the City shall estimate wastewater flow by assuming three people per household and one hundred gallons usage per person daily. For apartments, City shall estimate wastewater flow by assuming two people per apartment unit and one hundred gallons usage per person daily. City reserves the right to meter wastewater flows when it believes there is sufficient flow to warrant such metering. Township agrees that such wastewater flows, whether determined by metering or the above described estimation method, shall be used for purposes of billing Township.

10. In accordance with Sections 1.03 and 2.01 the wastewater service charges to Abington Township shall initially be as follows:

1) An annual lump sum charge; inclusive of depreciation expense, return on investment, sewer maintenance expenses and customer related costs of $114,300 plus

2) A volume charge of $0.2543 per each 1000 cubic feet (Mcf) of wastewater delivered plus

3) A capacity charge of $2,807 per cubic foot per second (cfs) of contracted wastewater capacity. This capacity or capacities to be used for billing purposes shall be that expressed herein in terms of cubic feet per second (cfs) plus

4) A charge of $66.35 for each 1000 pounds of suspended solids (S.S.) delivered plus

5) A charge of $49.17 for each 1000 pounds of bio-chemical oxygen demand (BOD) delivered.

In addition to the above requirements the City, the Township of Abington, County of Montgomery, Commonwealth of Pennsylvania and the Township of Cheltenham, County of Montgomery, Commonwealth of Pennsylvania shall have the following provisions:

1. City shall receive wastewater from Abington at a gauging station, constructed and owned by the City at the intersection of Fillmore and Shelmire and convey wastewater from Abington at a maximum rate not to exceed 0.480 cubic feet

per second. Said wastewater shall originate within the Tacony Creek watershed in those portions of Abington and the Borough of Rockledge, which drains naturally to the above described intersection, and shall be conveyed through the sewers of the City to the gauging station at Orville Avenue and Cottman Street, and thence through the sewers of Cheltenham to the boundary line between the City and Cheltenham and into the sewers of the City.

2. The above paragraph shall in no way serve to diminish the capacity reserved for the City in the Cheltenham sewers; and likewise shall in no way serve to increase the capacity allotted by the City to Cheltenham.

3. The quantity and quality of wastewater received by the City from Abington at the gauging station at Fillmore and Shelmire Streets, shall be reported to Cheltenham by the City, in order that Cheltenham may in turn bill Abington for conveyance through the sewers of Cheltenham, and for treatment and disposal of wastewater, and that quantity and quality so measured shall be deducted from the total quantity and quality measures and quality originating within the City and passing through the Orville Avenue gauging station.

4. Abington shall pay to Cheltenham, if and when Cheltenham is called upon to make payment of same, its proportion or proportions of the payment to be made by Cheltenham to the City under the Agreement between Cheltenham and the City for the conveyance treatment and disposal of wastewater by the City from Cheltenham.

MAW29

2) A volume charge of $0.1491 per each 1000 cubic feet (Mcf) of wastewater delivered; plus,

3) A capacity charge of $2,396 per cubic foot per second (cfs) of contracted wastewater capacity. This capacity or capacities to be used for billing purposes shall be that expressed herein in terms of cubic feet per second (cfs); plus,

4) A charge of $24.74 for each 1000 pounds of suspended solids (S.S.) delivered; plus,

5) A charge of $37.59 for each 1000 pounds of bio-chemical oxygen demand (BOD) delivered.

UTH1

Sample Long-Term Agreement

AGREEMENT

This Agreement, made this 16th day of May, 1988 and effective as of April 1, 1988 by and between the City of Philadelphia, hereinafter called "City", and the Bensalem Township Authority, created pursuant to the Municipal Authorities Act of 1945, Act of May 2, 1945, P.L. 382 § 1, as amended 53 P.S. § 301, (hereinafter called "Authority").

WITNESSETH:

WHEREAS, City owns and operates wastewater collection and treatment facilities to convey, treat and dispose of wastewater and its by-products, including sludge, collected from retail customers within the City and from outlying municipalities, townships, authorities and entities including Authority; and

WHEREAS, City desires to reserve wastewater treatment capacity for wholesale suburban customers at its Northeast Water Pollution Control Plant (the "Plant") on a long term basis to ensure the most efficient use of the City's resources and facilities, and to provide full and fair compensation to City; and

WHEREAS, the Council of the City of Philadelphia has by Ordinance, Bill No. 1129, approved by the Mayor on May 20, 1987, authorized the Water Commissioner to enter into new agreements for the sale of wastewater treatment service to suburban communities; and

WHEREAS, Authority desires to acquire wastewater treatment capacity from City at the Plant to ensure a sufficient wastewater treatment capacity for the communities it serves; and

WHEREAS, the Plant has limited capacity and City has other suburban customers who purchase wastewater treatment service from City; and

WHEREAS, Authority agrees to pay for its reserved wastewater treatment capacity in accordance with this Agreement;

NOW, THEREFORE, intending to be legally bound and in consideration of the mutual covenants contained in this Agreement, the parties agree as follows:

I. WASTEWATER QUANTITY AND QUALITY

A. Reservation of Capacity - City shall reserve wastewater treatment capacity for the Authority at the Plant as set forth in Exhibit "A" attached hereto and incorporated herein ("Flow and Loadings Limits").

B. Capital Contribution - Upon execution of this Agreement, in consideration of the reservation of capacity at the Plant, Authority shall pay FOUR MILLION AND FOUR HUNDRED THOUSAND DOLLARS ($4,400,000.00) to City for net cost to City for wastewater conveyance and treatment facilities, systems and equipment completed prior to July 1, 1986 and allocated to the service of Authority under the terms and conditions stated herein plus ONE HUNDRED AND FIFTY THREE THOUSAND AND THREE HUNDRED TWENTY DOLLARS

($153,320.00) for wastewater conveyance and treatment facilities, systems and equipment allocated to the service of Authority as stated herein and completed as of March 31, 1988. These sums plus any additional sums paid to City by Authority for facilities, systems and equipment allocated to Authority under this Agreement shall be referred to as Authority's "Capital Contribution."

C. Pro-rata Share of New Facilities and Renewal and Replacement -

(1) Authority agrees to pay to City its pro-rata share as calculated by City of capital costs for improvement to and/or renewal and/or replacement of facilities, and for new facilities, excepting however, new facilities which are intended solely to increase the marketable and marketed capacity of the Plant. The costs to be allocated shall be net of grants or other reimbursement from the federal or state government. City shall provide Authority with a Facilities Capital Budget not later than thirty (30) days before the beginning of City's Fiscal Year to notify Authority of its share of the cost of capital improvements and renewal and replacement.

(2) Authority agrees to pay actual costs of capital improvements or renewal and replacement within sixty (60) days of receipt of the bill. In the event that Authority does not pay the bill when due, late charges will accrue at the rate of one and one-quarter percent (1-¼%) per month sim-

a) That upon written notice of exceedances from City, Authority shall develop and submit to City within one hundred and eighty (180) days of written notice a written report detailing a plan of action to eliminate the exceedances within five (5) years from the date of submission of the written report. City shall promptly approve or disapprove the plan. Approval of the plan outlined in the report will not be unreasonably withheld. City shall notify the Authority in writing within sixty (60) days of receipt of the plan of approval or disapproval, including reasons for disapproval.

b) If Authority fails to submit in good faith a report outlining a plan to eliminate exceedances, or if City cannot approve such a plan, Authority shall be liable to City for a penalty of One Thousand Dollars ($1,000.00) per week until such time as Authority submits a plan which City approves.

II. WASTEWATER TREATMENT CHARGE

A. Wastewater Treatment Charges - Authority agrees to pay wastewater treatment charges. The wastewater treatment charges shall consist of:

(1) An operation and maintenance charge based upon actual or estimated wastewater flows and actual or estimated BOD and SS Loadings of wastewater delivered to the Plant by Authority. The operation and maintenance charge shall be

based upon the cost (as defined below at Paragraph II.A. (3)) of conveying and treating wastewater delivered by the Authority. Such charges shall be based upon flow and loading rates of wastewater delivered as well as charges based upon billing, metering, sampling and other related fixed costs.

(2) A management fee equal to ten percent (10%) of the charges set forth in paragraph (1).

(3) For the purpose of this Agreement the term "Cost" shall include all direct and indirect expenses, including but not limited to, labor, materials, equipment, power, chemicals, rentals, benefits and departmental overhead. Departmental overhead shall include, but not be limited to, administrative, financial, legal, accounting and engineering support.

(4) Authority shall have the right upon written request to review City's method of computing and allocating the cost of providing wastewater treatment service to Authority.

B. Billing and Penalties for Late Payment -

(1) City shall render bills to Authority on a quarterly basis for the charges set forth in this Agreement. City reserves the right to bill Authority on a more or less frequent basis in the future.

(2) Bills shall be payable to City by Authority within thirty (30) days of receipt of bill by Authority. Authority shall notify City in writing of disputed charges prior to their due date. Authority may withhold payment of disputed

charges, but in the event the dispute is resolved in favor of City, payment withheld shall be subject to late fees running from the original due date for said charges. In no event shall City be liable to Authority for payment of interest or late fees of any nature on disputed charges.

(3) Late fees at the rate of one and one-quarter percent (1-1/4%) per month simple interest shall be added to any balance unpaid thirty (30) days after billing.

(4) City, upon six (6) months prior written notice to Authority, may increase or decrease late fees to a level reflecting additional or decreased costs incurred by City.

C. Notice of Changes in Rates - City shall provide notice to Authority of any change in rates or billing practices at least ninety (90) days in advance of the effective date of such new rates or practices.

III. METERING, SAMPLING AND BILLING

A. Actively Metered Connection Points - City shall measure wastewater flow and loadings by metering and sampling at "Actively Metered Connection Points" as set forth in Exhibit C for so long as City, in the reasonable exercise of its sole discretion, determines that this is necessary, practical and/or economical. City shall base its operation and maintenance charges on actual flow and loadings measures where these exist.

B. Unmetered Connection Points - City shall estimate wastewater flow and loadings for "Unmetered Connection Points"

as currently set forth in Exhibit C and for such "Actively Metered Connection Points" as City may determine it is unnecessary, impractical and/or uneconomical to meter and/or sample wastewater flow and loadings pursuant to III.A. (collectively "All Unmetered Connection Points".) City shall base its operation and maintenance charges on estimates where no actual measures of flow and loadings exist.

Until April 30, 1989, City shall estimate flow and loadings at All Unmetered Connection Points using Current Estimated Data as set forth in Exhibit D; as soon thereafter as is practicable, City shall estimate flow and loadings at Unmetered Connection Points using Future Estimated Data as set forth in Exhibit E. City may confirm estimated data with portable temporary flow meters or through other available technology. Authority shall supply City with information on the dates set forth and as required in Exhibit E ("Required Information").

C. Additional Metered Connection Points -

(1) City may require Authority to meter all or some Unmetered Connection Points ("Additional Metered Connection Points") if, the City deems it necessary, practical or economical to measure rather than estimate wastewater flow. Prior to requiring metering for these reasons, City shall serve Authority with a written notice of intent to require metering, and shall allow, within sixty (60) days, Authority

the opportunity to present written and/or oral comment as to whether metering is necessary, practical or economical. City shall retain the right to make the ultimate determination subject to the Authority's right to arbitrate as set forth at § VI.B. supra.

(2) If Authority fails timely to provide City with Required Information, City may, at its sole option, either continue to estimate wastewater flow and loadings using its best judgment or require Authority to add as "Additional Metered Connection Points" those Unmetered Connection Points for which it has failed to supply all Required Information. Prior to requiring metering, City shall serve Authority with a written demand for required information and shall allow Authority up to sixty (60) days to provide Required Information.

D. Additional Metered Connection Points - Metering and Maintenance Sampling - Authority and City shall have the following rights and responsibilities as to any Additional Metered Connection Points required by City.

(1) Authority shall submit for approval by City, plans and specifications for the design and installation of equipment for metering and sampling wastewater and for telemetering the metered signal to City. Approval of said plans and specifications shall not be unreasonably withheld.

(2) Upon approval by City, said metering and telemetering equipment shall be installed by Authority to City's satisfaction.

(3) All purchase and installation costs for metering and telemetering equipment including equipment installed by City whether installed within or outside of the city limits shall be borne by Authority.

(4) Authority shall pay for and provide a dedicated, leased telephone line approved by City for the purpose of transmitting information from the meter to City. Authority shall also pay for and provide electrical power required to operate the telemetering equipment in Authority.

(5) City shall have the right to enter the area served by Authority at any time upon reasonable advance telephone notice to read the meters installed by Authority, to record the quantity of wastewater flowing through said meters, to inspect metering and telemetering equipment and to maintain telemetering equipment. City may require Authority to certify accuracy of meters through state-approved third party on an annual basis.

(6) Authority shall own and maintain metering equipment and the electronics associated with the meter installed in area served by Authority. City shall own and maintain telemetering equipment installed in area served by Authority which shall consist of equipment which converts the signal produced by the meter into a signal which can be transmitted over telephone lines. City shall also own and maintain all equipment located in City necessary to receive and record telemetered information.

E. Sampling - City shall have the right to enter the area served by Authority at any time upon reasonable advance telephone notice to sample Authority's wastewater. Upon Authority's request and if Authority's representative is present, City shall provide Authority with a portion of sample ("split sample").

F. Billing Information - Within sixty days of receipt of Authority's written request, City shall provide to Authority copies of wastewater flow and loadings data and computations utilized in billing Authority.

IV. WASTEWATER QUALITY RESTRICTIONS

A. Interjurisdictional Pretreatment Agreement - City and Authority shall enter into the contract attached hereto and incorporated herein as Exhibit "F" ("Interjurisdictional Pretreatment Agreement"). Authority agrees to comply with all of the provisions contained therein.

B. Sludge Utilization -

(1) Authority recognizes the importance and urgent need to utilize sludge in a timely and proper manner. Immediately upon signing of this Agreement, Authority and City shall work to develop an environmentally sound sludge utilization program utilizing at least the Authority's pro rata share of sludge produced by the City and meeting federal and state standards within the area served by Authority. Authority shall propose a sludge utilization program which does not require a Pennsylvania Department of Environmental Resources

permit by July 15, 1988 and thereafter shall continue to work with City to develop other applications for sludge utilization in the area served by Authority.

(2) Authority shall promote and support City's community education program for sludge by identifying community groups for City which have an interest in sludge utilization and aid in providing City with appropriate facilities in Bensalem Township at which City may conduct educational programs.

(3) City acknowledges that Authority has no direct authority or control over Bensalem Township and its sludge utilization program. Authority agrees to exert its best efforts to facilitate and achieve cooperation in sludge utilization program between City and Bensalem Township.

V. PAYMENT OF MONIES DUE AND OWING

Upon execution, Authority and City agree to fulfill their respective financial obligations under a prior agreement of December 10, 1982 as modified herein. Authority shall pay a 10% management fee and City shall adjust the capital portion of the lump sum charge in consideration of the Capital Contribution made under this Agreement and effective retroactively as of July 1, 1986.

VI. MISCELLANEOUS

A. Inspection and Audit - The parties agree that each shall keep complete records and accounts concerning their responsibilities under this Agreement. Each party shall at all times

have the right to examine and inspect said records and accounts upon 30 days prior written notice. If required by any law or regulation, Authority shall make said records and accounts immediately available to federal and state auditors.

B. Arbitration of Disputes - If any dispute shall arise between the parties hereto, concerning terms, conditions and covenants of this Agreement or alleged violations thereof, the same shall be submitted to a Board of Arbitration. The Board of Arbitration shall be composed of three (3) arbitrators, one appointed by City, one by Authority, and the third to be agreed upon jointly by the arbitrators selected by City and Authority.

The arbitrators representing Authority and City shall be named within five (5) days from the request for the appointment of such Board. If after a period of ten (10) days from the date of the appointment, the two (2) arbitrators appointed by City and Authority cannot agree on the third arbitrator, then either appointed arbitrator may request the American Arbitration Association or its successor to furnish a list of three (3) members of said Association, who are not residents of either Philadelphia, Bucks Counties or Bensalem Township, from which the third arbitrator shall be selected.

The arbitrator appointed by Authority shall then eliminate one (1) name from the list furnished by the American Arbitration Association within five (5) days after its publication, following which the arbitrator appointed by City

shall eliminate one (1) name from the list within five (5) days thereafter. The individual whose name remains on the list shall be the third arbitrator and shall act as the Chairman of the Board of Arbitrators.

Each party shall bear the costs of its own arbitrator and the parties shall equally divide the costs of the third arbitrator and all other common costs.

The Board of Arbitrators, thus established, shall commence the arbitration proceedings within ten (10) days after the third arbitrator is selected and shall make its determination within thirty (30) days after the appointment of the third arbitrator. The decision of such arbitrators shall be final and binding upon the parties, except in the case of fraud.

C. Claims, Insurance and Related Matters -

(1) Authority agrees to defend, indemnify and save harmless City from and against all claims, actions, causes, suits, demands, losses, interest, penalties and liabilities arising from performance of the terms and conditions of this Agreement by reason of:

a) City's inability, due to causes beyond its control, to perform any of the provisions of this Agreement;

b) Injury (including death) to persons and damages to property resulting from operations under this Agreement to convey Authority's wastewater to the Plant,

whether due to the negligence or gross negligence of City or Authority or their employees, servants or agents or the inherent nature of their operations;

c) EPA or Pennsylvania Department of Environmental Resources action of any kind whatsoever, whether direct or indirect, for any work undertaken by Authority, its contractors or consultants, necessary and required by this Agreement due to rejection of said work by the EPA or Pennsylvania Department of Environmental Resources;

d) Any grant fund, or any portion thereof, received by Authority and later determined to be ineligible for reimbursement by the appropriate regulatory agency or grant auditors.

(2) City and Authority agree that in the event of EPA or Pennsylvania Department of Environmental Resources action or any other governmental regulatory action against City of any kind whatsoever, for activities carried out under this Agreement either by City or Authority or their employees, servants or agents, City and Authority shall equitably apportion responsibility for payment of any costs, fines, penalties or damages arising from such action.

(3) Anything in this Agreement to the contrary notwithstanding, Authority shall not be liable for injuries (including death) or property damage occurring during the course of treatment at the Plant, except, to the extent that such injuries and damages increase City's operating costs,

Authority shall be responsible for its proportionate share of those increased costs.

(4) Nothing set forth in this Agreement shall limit or debar City from resorting to any appropriate remedy in law or equity, or any combination of remedies for non-compliance with this section VI.C of this Agreement.

(5) Nothing contained in this Agreement shall be deemed to confer upon any third person any right against City or Authority or to vest in said third person any cause of action against City or Authority or to authorize any such person to institute any suit or suits against City or Authority.

(6) City shall have the right to approve counsel appointed on its behalf pursuant to this Agreement, unless appointed by Authority's insurer.

D. No Transfer of Rights - Authority shall not confer, transfer, convey, assign or license to any third party any rights obtained under this Agreement including but not limited to assignment of wastewater treatment capacity without the express prior written consent of the City. Such consent shall not be unreasonably withheld.

E. Term -

(1) Except as set forth in Section V, this Agreement shall be effective as of April 1, 1988, and shall continue in force and effect until terminated as hereinafter set forth.

(2) City shall have the right to terminate this Agreement for "cause" at any time, but only upon five (5)

years' written notice. "Cause" shall mean:

a) continuing exceedances of the flow and loadings limits which are not corrected as required by this Agreement and which impair the safe and efficient operation of the system or which cause City to be in violation of permits issued by PaDER or EPA; or

b) failure by Authority to meet its financial obligations under this Agreement for a period of six consecutive months; or

c) failure by Authority to comply with a decision or determination of a Board of Arbitration or court of competent jurisdiction rendered under this Agreement within three months of the date of the decision or determination unless otherwise specified by the Board of Arbitrators.

(3) In the event that City terminates this Agreement for cause, Authority shall forfeit its capital contribution.

(4) Authority or City may terminate this Agreement for any reason after it has been in effect for thirty-five (35) years, but only by giving written notice five (5) years before the effective date of termination.

(5) In the event this Agreement terminates for any reason, except for cause as set forth in subparagraph (2) of this Section VI. E., City shall pay to Authority an amount equal to the Authority's share of the then-remaining value of all systems, equipment and facilities used to convey and treat Authority's wastewater under this Agreement (the

"Assets"). The remaining value of the Assets shall be calculated as follows:

a) The remaining useful life of each component of the Assets shall be separately calculated.

b) The original and all subsequent contributions by the Authority towards the cost of acquisition, renewal and replacement of each component of the Assets shall be multiplied by a fraction whose numerator is the remaining useful life of the component, and whose denominator is the sum of the years the component has been in service since April 1, 1988, plus the remaining useful life.

c) The amount thus calculated shall be paid to the Authority in cash on the effective date of termination.

d) The calculation required hereunder shall be made by an independent appraiser selected jointly by the City and the Authority. The expense of the appraisal shall be divided equally between the City and the Authority. If the City and the Authority cannot agree on an appraiser, then one shall be selected by the same method to be used to select a third arbitrator under Section VI.B. of this Agreement.

F. Ownership, Management and Control of Plant Facilities - City retains sole ownership and control of the Plant and all other sewage treatment facilities in the City and agrees to operate, maintain, repair, and improve its facilities associated

with service to Authority. City retains the sole and exclusive right to make all managerial and other decisions regarding its sewage treatment facilities, including but not limited to those decisions regarding maintenance, upkeep, expansion, or replacement of all or a portion of it sewage treatment facilities.

G. Severability - In the event any provision hereof is held illegal or invalid, no other provision of this Agreement shall be affected; and this Agreement shall then continue in full force as if such illegal or invalid provision had not been contained herein.

H. Successors and Assigns - All the covenants contained in this Agreement shall extend to and bind the respective successors and assigns of the parties hereto with the same effect as if the words "successors and assigns" had, in each case, been specifically mentioned.

I. Waiver - The failure of a party hereto to insist upon strict performance of this Agreement or of any of the terms or conditions hereof shall not be construed as a waiver of any of its rights herein granted.

J. Notices - All notices, payments and communications required to be given in writing under this Agreement shall be sent by United States mail, postage prepaid, or delivered by hand delivery with receipt obtained, to the addresses below or at such other addresses as City or Authority may designate in writing from time to time:

If intended for City:

Water Commissioner
ARA Tower
1101 Market Street
Philadelphia, Pennsylvania 19107

If intended for Authority:

Executive Director
Bensalem Township Authority
P.O. Box 846
3830 Hulmeville Road
Bensalem, PA 19020

All notices shall be deemed received five (5) calendar days after mailing or upon actual receipt, whichever is earlier.

K. Captions - The captions in this Agreement are for convenience only and are not part of the Agreement. The captions do not in any way define, limit, describe or amplify the provisions of this Agreement or the scope or intent thereof.

L. Entire Agreement - This Agreement and its Exhibits and Addendums, incorporated herein, represent the entire agreement of the parties hereto and there are no collateral or oral agreements or understandings. This Agreement may be amended or modified only in writing signed by both City and Authority.

IN WITNESS WHEREOF, The City of Philadelphia has caused this Agreement to be executed by its Water Commissioner; and the appropriate officer of the Bensalem Township has executed this Agreement on behalf of the Authority, and has hereunto affixed the corporate seal of the said Authority duly attested by the Appropriate officer thereof, the day and year first above written.

CITY OF PHILADELPHIA

By: WILLIAM J. MARRAZZO
Water Commissioner

Approved as to form:

By: SEYMOUR KURLAND
City Solicitor

BENSALEM TOWNSHIP

By: FRANK J. HYNES
General Manager

Attest:

Edward Rudolph

BENSALEM

FLOW AND LOADINGS LIMITS ADDENDUM

FLOW LIMITS

Maximum Annual Avg.	Instantaneous Maximum
6.133 MGD	11.74 cfs

SS AND BOD LOADINGS

Annual Suspended Solids Loadings	Annual Biochemical Oxygen Demand Loadings
3,734,000 lbs.	5,340,000 lbs.

EXHIBIT A

BENSALEM

EXCEEDANCE CHARGES ADDENDUM

I. Volume: As of April 1, 1988, Authority shall be liable to City for the following exceedance charges when Authority exceeds the quantity flow limits set forth in the Flow Limits Addendum:

A. $3,700.00 per unit of flow over the average daily limit during any consecutive 365 day period, such charge to be billed annually. The unit of flow used to determine exceedances shall be each hundred thousand gallons of wastewater flow per day.

II. Strengths: As of April 1, 1988, Authority shall be liable to City for the following exceedance charges when Authority exceeds the quality flow limits set forth in the Flow Limits Addendum:

A. Suspended Solids (SS): $480.00 per thousand pounds over the limit;

B. Biochemical Oxygen Demand (BOD): $900.00 per thousand pounds over the limit.

III. Charges for Years Subsequent to 1988

During January 1989 and during January of each calendar year thereafter, the exceedance charges stated above will be adjusted in accordance with the changes in the Consumer Price Index for the prior calendar year. The index to be used for this adjustment shall be the Consumer Price Index published by the U.S. Bureau of Labor Statistics for all urban consumers (CPI-U) for the Philadelphia SMSA, all items.

BENSALEM
*APPROVED CONNECTION POINTS TO CITY WASTEWATER SYSTEM

I. Actively Metered Connection Points

In the vicinity of:

1. Grant Avenue and James Street
2. Townsend and Poquessing Creek
3. Gravel Pike

II. Unmetered Connection Points

In the vicinity of:

1. Kay Street and Poquessing Street
2. Evelyn and Emerson Avenues
3. Knights and Frankford Avenues
4. Dunks Ferry Road
5. Betz Laboratory
6. Doral Apartments
7. Bensalem Shopping Center
8. Colonial Creek Apartments
9. Elmwood Apartments

*These connection points are billing or account connections which may represent more than one physical interceptor or connection to the sewer system.

EXHIBIT C

CURRENT ESTIMATED WASTEWATER FLOW AND LOADINGS DATA

FOR UNMETERED CONNECTION POINTS ("CURRENT ESTIMATED DATA")

Billing Account	Quarterly Flow mg/qtr.	BOD mg/l	S.S. mg/l	Annual BOD #/yr	Loading S.S. #/yr.
Elmwood Apts.	21.1 mg	656	511	461,800	359,720
Colonial Creek Apts.	21.1 mg	537	205	378,040	144,320
Doral Apts.	21.1	296	314	203,360	221,040
Betz Lab	3.4	245	188	27,920	21,440
Bensalem Shopping Ctr.	19.71	269	125	176,880	82,200
Sub-Total	86.41 mg			1,248,000	828,720
Gravel Pike	64.696	353	185	762,160	398,360
Townsend & Poquessing	79.335	203	125	537,280	277,880
Grant & James St.	27.291	605	244	550,600	221,800
Sub-Total	171.322 mg			1,850,040	898,040
Kay & Poquessing	11.9	158	126	62,720	50,000
Dunks Ferry Road	18.3	137	123	83,640	75,080
Knights & Frankford	10.7	207	198	73,880	70,680
Evelyn & Emerson	7.424	207	198	51,280	49,040
Sub-Total	48.324			271,520	244,800
Total	306.056 mg/q			3,369,560	1,971,560 #/yr
Average Daily	3.35 MGD				
Capacity	6.133 MGD			5,340,000	3,734,000 #/yr

EXHIBIT D

ESTIMATED WASTEWATER FLOW AND LOADINGS DATA FOR ALL UNMETERED CONNECTION POINTS AFTER APRIL 30, 1989 ("FUTURE ESTIMATED DATA")

For all areas for which City shall estimate wastewater flow and loadings including All Unmetered Connection Points (see III.B. supra), Authority shall provide City with information as required in this exhibit ("Required Information"). As soon after receipt of Required Information as City deems practicable, City shall use Required Information to estimate wastewater flow and loadings. City may revise such estimates after receipt of updated information.

1. Flow Data. City shall determine estimated flows based on the following:

   A. Properties Metered For Potable Water - On or before April 30, 1989 and continuing on each anniversary thereof, Authority shall provide City, in writing, the addresses and names of each owner (except for names of owners of residential properties) of all properties whose wastewater is directed by Authority to City for processing and which are supplied by Authority with potable water and metered therefor. For each address, Authority shall indicate Connection Point through which

wastewater flows. Authority shall further provide City with all water billing information, including but not limited to total consumption, related thereto.

B. Properties Not Metered For Potable Water - On or before April 30, 1989 and continuing on each anniversary thereof, Authority shall provide City, in writing, with addresses and names of owners (except for names of owners of residential properties) of all properties whose wastewater is directed by Authority to City for processing and which are supplied by Authority with potable water but not metered therefor. For each address, Authority shall indicate Connection Point through which wastewater flows.

Authority shall characterize properties as single or multiple-unit residences (if multiple, number of units), or as commercial, industrial or miscellaneous properties. For residences, the City shall calculate consumption at the rate of 100 gallons per person per day and multiply by 3.6 persons per single family dwelling or 2.5 persons per apartment unit. For commercial, industrial, or miscellaneous properties, Authority in its annual written notice to City, shall provide a brief description of the property and its use including a description of how water is used, and the City shall in its sole discretion, reasonably exercised, calculate consumption. Authority shall supply City with addi-

tional information regarding properties if requested by City, provided such information is reasonably available to Authority.

C. Infiltration - By July 1, 1988, and annually by April 30 thereafter, Authority shall provide City in writing with the total sewer miles for each size diameter gravity sewer pipe in all areas served by All Unmetered Connection Points. City shall calculate the discharge into the City of groundwater infiltration into the Township sewers at the rate of 200 gallons per day per inch diameter of sewer pipe per mile.

D. Modification of Rates - Consumption rates, number of persons per household, and infiltration rates are based on guidelines set forth in the standard literature including that published by the Pennsylvania Department of Environmental Resources. City may modify consumption rates, number of persons per household, and/or inflow/infiltration rates at its sole discretion, reasonably exercised, to conform to revised accepted standards as set forth in the standard literature.

2. Concentration Standards - City has developed concentration standards for unmetered connections based on long term loadings averages (see Exhibit D). Every five years City shall reconfirm sewage concentration standards used to determine loadings using an intensive 90 day (week days only)

sampling program. Each year City shall sample at a standardized connection for no more than a week, City shall analyze the data and, in its sole discretion reasonably exercised, shall determine whether an intensive sampling should be conducted sooner than at five year intervals.

3. By July 1, 1988 and annually by April 30 thereafter, the Authority shall provide City in writing with a listing of any changes in connections of unmetered areas to metered areas or vice versa.

INTERJURISDICTIONAL PRETREATMENT AGREEMENT
BETWEEN
THE CITY OF PHILADELPHIA
AND
THE BENSALEM TOWNSHIP AUTHORITY

This Agreement is entered into this 16th day of May, 1988, between the City of Philadelphia ("City") and the Bensalem Township Authority ("Authority").

RECITAL

Whereas, City owns and operates a wastewater treatment system; and

Whereas, Authority currently utilizes this wastewater treatment system pursuant to an agreement between City and Authority dated (the "Service Agreement"); and

Whereas, City must develop and implement an industrial pretreatment program pursuant to conditions contained in its discharge permit (Permit # PA0026689) issued by the Pennsylvania Department of Environmental Resources; and

Whereas, Authority desires to continue to utilize the wastewater treatment system and recognizes its industrial waste control obligations under 40 CFR 403.

In consideration of the following terms and conditions City and Authority agree:

1. Within one year of the adoption by the City of its new wastewater control regulations Authority shall adopt and diligently enforce rules and regulations (hereinafter "regulations") substantially identical to the regulations adopted by City.

2. Authority shall explicitly incorporate the following provisions into its regulations:

   (a) a provision requiring any industrial user responsible for any accidental discharge to notify immediately both City and Authority;
   (b) a prohibition on the use of dilution as a control technique for compliance with discharge limits except as allowed by Federal Pretreatment Standards;
   (c) a grant of authority to impose mass discharge limits in lieu of, or in conjunction with, concentration discharge limits;
   (d) a prohibition against and penalty for the knowing transmittal of false information by an industrial user to either City or Authority;

EXHIBIT F

(e) a grant of explicit authority to Authority to require the industrial user to install all monitoring and pretreatment facilities.

3. City and Authority shall periodically (at a minimum of every five years) review their respective regulations and jointly draft and adopt equivalent amendments where necessary to ensure the effective administration and operation of the pretreatment program. Whenever City becomes aware of a problem with the pretreatment program which can be mitigated by a change in the ordinance, City may draft an amendment which Authority must adopt. If Authority has adopted regulations identical to City's regulations, then, whenever City amends its regulations, Authority shall adopt the identical amendment.

4. Authority shall adopt, as part of its regulations, and enforce specific discharge limits at least as stringent as the specific discharge limits established in City regulations.

5. Authority regulations shall require that categorical pretreatment standards promulgated by the U.S. Environmental Protection Agency (EPA) by authority of the Clean Water Act Sections 307(b) and (c) be automatically incorporated by reference into Authority's regulations. These standards shall supercede any specific discharge limits in the ordinance which are less stringent than the categorical standards as they apply to the particular industrial subcategory. Authority shall notify all affected industrial users of pertinent categorical standards and monitoring and reporting requirements contained in 40 CFR 403.12 or included as part of the categorical standards.

6. Authority shall adopt in its regulations definitions for "significant industrial user", "industrial user" and "nondomestic user" which are identical to the definitions adopted by City. City may make the final determination as to whether a particular industrial user is a significant industrial user, industrial user or nondomestic user based on information City may request from Authority. City shall control, through industrial discharge permits, industrial waste discharges from each significant industrial user, industrial user or nondomestic user discharging into the sewer.

7. If there exists any industrial user discharging to Authority sewer system but located outside the jurisdictional limits of Authority, then Authority shall within 30 days of this agreement notify such jurisdiction of this requirement and provide the City with copies of such notification. Authority shall negotiate and enter into an agreement with this outside jurisdiction. Such agreement shall be substantially equivalent to this Agreement, and shall be jointly executed by Authority, City and the outside jurisdiction. If the outside jurisdiction refuses to negotiate and execute an agreement, then City shall enter into a contract with the industrial user which contains terms and conditions substantially equivalent to City industrial discharge permits.

8. Authority shall file with City a certified copy of its ordinance and any amendments thereto, other interjurisdictional agreements, and any contract entered into for the purposes of industrial waste control. If

Authority maintains, Authority shall provide City access to and copies of, if requested, all industrial monitoring reports including 40 CFR §403.12 compliance reports, self-monitoring reports, baseline reports, records of violations and actions taken, and any other monitoring or reporting requirements imposed by federal, state or local regulations. These records and other relevant information shall be maintained for at least six years.

9. Any authorized officer or employee of City may enter and inspect at any reasonable time any part of the sewer system of Authority. The right of entry and inspection shall extend to public streets, easements, and property within which the system is located. Additionally, City shall be permitted, as appropriate, to enter onto private property to inspect industrial waste discharges. Authority shall provide complete sets of sewer plans and make all necessary legal and administrative arrangements for these inspections. The right of inspection shall include on-site inspection of pretreatment and sewer facilities, observation, measurement, sampling, testing, and access to (with the right to copy) all pertinent compliance records located on the premises of the industrial user or non-domestic dischargers.

10. Authority and City hereby agree that the City shall implement a pretreatment program within Authority and shall perform in connection therewith technical and administrative activities which may include: 1) updating the industrial waste survey; 2) providing technical services, such as sampling, process chemical analysis, and engineering advice; 3) permitting; 4) compliance monitoring; 5) enforcement support and 6) monitoring hazardous waste disposal practices. Authority may assume responsibility for conducting the pretreatment program implemented by City at any time upon 90 days advance written notice. To the extent Authority shall administer its own pretreatment program, it shall provide the City in writing a detailed outline of the program 90 days prior to initiating such a program and the City shall have the right to approve or disapprove the program. City may periodically review Authority pretreatment program activities and funding to ensure that Authority and any outside jurisdiction is adequately administering its pretreatment program in conformance with the Federal Pretreatment Regulations (40 CRF 403) and all City requirements.

11. City shall review Authority ordinance and amendments thereto, and any interjurisdictional agreements for conformance with 40 CRF part 403, and to ensure inclusion of all other legal provisions mandated by this Agreement. City shall periodically review the enforcement efforts of Authority and any other jurisdiction to ascertain whether pretreatment requirements are being diligently enforced.

12. If City determines that Authority has failed or has refused to fulfill any pretreatment obligations, City may develop and issue a remedial plan containing a description of the nature of the pretreatment deficiencies, an enumeration of steps to be taken by Authority, and a time schedule for attaining compliance with all pretreatment requirements. Such plans shall be specifically enforceable in a court of competent jurisdiction. Where Authority fails to satisfy the terms of the remedial plan, City may, upon thirty days written notice, refuse to accept any industrial waste discharges from Authority.

13. In the event that EPA or Pennsylvania Department of Environmental Resources action results in fines, penalties or costs being assessed against City because of industrial or non-domestic waste discharged from Authority, Authority and City shall equitably apportion responsibility for payment of such fines, penalties or costs. Authority shall fully indemnify, defend and hold harmless City for damages or costs arising from personal and property damage pursuant to the Service Agreement.

14. Where a discharge to the wastewater treatment system reasonably appears to present an imminent danger to the health and welfare of persons, or presents or may present an imminent danger to the environment, or threatens to interfere with the operation of the wastewater treatment system, City may immediately initiate steps to identify the source of the discharge, and to hold or prevent said discharge. City may seek injunctive relief against Authority or outside jurisdictions and/or any industrial or non-domestic user contributing to the emergency conditions, and/or may pursue other self-help remedies. Authority shall pay to City the cost of such steps taken to prevent, stop or ameliorate the effects of such discharge.

15. Any disputes arising out of this Agreement shall be submitted to binding arbitration performed in accordance with the procedures set forth in the Service Agreement between Authority and City dated May 16, 1988.

16. The terms of this Agreement may be amended only by written agreement of the parties. In any event, this Agreement shall be reviewed and revised, as necessary, at least every five years.

17. This Agreement modifies only those provisions of the existing Service Agreement between the two parties which conflict with the terms of this Agreement.

18. This Agreement will remain in effect so long as the Service Agreement remains in effect. Termination of the Service Agreement shall also result in the termination of this Agreement.

The parties hereto have executed this Agreement on the date shown above.

WILLIAM J. MARRAZZO, WATER COMMISSIONER
CITY OF PHILADELPHIA

DATE 5/16/88

FRANK J. HYNES
BENSALEM TOWNSHIP AUTHORITY

DATE 5/16/88

ATTEST

DATE 5/16/88

APPENDIX C

List Of Industrial Dischargers And NPDES Permit Numbers

DER DATA REPORT: Philadelphia County

Establishment Name / Facility Name	Permit #, Date	Prog.	Degree/Treatment Process	Avg. Flow	Max. Flow	Discharge Stream Name
ALLIED CHEMICAL						
ALLIED CHEM-DISCH O SEWER	PA001201 940601	IW				FRANKFORD CREEK
AMERADA HESS						
AMERADA HESS-DISCH 001	PA001142 940615	IW				SCHUYLKILL RVR
AMERADA HESS-OIL SEPARATO	PA001142 940615	IW	7 / 1H			
ATLANTIC RICHFIELD &						
ARCO-API SEPARATOR & BASI	PA001262 900919	IW	7 / 1U,1H,2D,3A		1,500,000	
ARCO-BIO AERATION -SOUTH	PA001262 900919	IW	7 / 1H,1U,2D,3H	5,000,000	6,700,000	
ARCO-OUTFALL-NORTH YD SEP	PA001262 900919	IW				SCHUYKILL RIVER
ARCO-OUTFALL-SOUTH-DP 002	PA001262 900919	IW				SCHUYLKILL RVR
ARCO-OUTFALL-WEST YARD 00	PA001262 900919	IW				SCHUYLKILL RVR
ARCO-SEPARATOR & SAND FIL	PA001262 900919	IW	7 / 1Y,1V	40,000		
ARCO-SOUTH YARD DP 004	PA001262 900919	IW				SCHUYKILL RIVER
B P OIL INC						
BP OIL TERM-GROUND SURFAC	PA004099 940711	IW				GROUND SURFACE
BP OIL TERM-LDG DOCK SEPA	PA004099 940711	IW	9 /			
BP OIL TERM-RUNOFF SEPARA	PA004099 940711	IW	/			
BP OIL TERM-STORM SEWER	PA004099 940711	IW				FRANKFORD CREEK
BROUDY, NORMAN DR-ST						
BROUDY,NORMAN DR-OUTFALL	PA005335 940407	SN				SCHUYLKILL RIVR
BROUDY,NORMAN DR-STP	PA005335 940407	SN	4 / 01,09,21,24	400	400	
BUDD COMPANY						
BUDD CO-DISCHARGE 001	PA001138 911107	IW				SCHUYKILL RIVER
BUDD CO-DISCHARGE 002	PA001138 911107	IW				SCHUYKILL RIVER
BUDD CO-DISCHARGE 003	PA001138 911107	IW				SCHUYKILL RIVER
BUDD CO-DISCHARGE 004	PA001138 911107	IW				SCHUYKILL RIVER
BUDD CO-DISCHARGE 005	PA001138 911107	IW				SCHUYKILL RIVER
BUDD CO-DISCHARGE 006	PA001138 911107	IW				SCHUYKILL RIVER
BUDD CO-DISCHARGE 007	PA001138 911107	IW				SCHUYKILL RIVER
BUDD CO-DISCHARGE 008	PA001138 911107	IW				SCHUYKILL RIVER
CONTAINER CORP OF AM						
CONTAINER CORP-DISCH 008	PA001257 930804	IW				SCHUYLKILL RIVE
CONTAINER CORP-DISCHARGE	PA001257 930804	IW				SCHUYKILL RIVER
CONTAINER CORP-DISCHARGE	PA001257 930804	IW				SCHUYKILL RIVER
DELAWARE RIVER PORT						
HOG ISLAND MARINE TERM ST	PA002144 920318	SN	4 /	1,900		
HOG ISLAND-OUTFALL 007	PA002144 920318	SN				DELAWARE RIVER
MUN PIER #11 NORTH-STP	PA002144 920318	SN	7 / 1W			
MUN PIER #12 NORTH-STP	PA002144 920318	SN	7 / 1W			
MUN PIER #38 SOUTH-STP	PA002144 920318	SN	7 / 1W			
MUN PIER #78-BLDG #3-STP	PA002144 920318	SN	7 / 1W			
MUN PIER #98 SOUTH-STP	PA002144 920318	SN	7 / 1W			
MUN PIER 11 N-OUTFALL 001	PA002144 920318	SN				DELAWARE RIVER
MUN PIER 12 N-OUTFALL 002	PA002144 920318	SN				DELAWARE RIVER
MUN PIER 19N-OUTFALL 003	PA002144 920318	SN				DELAWARE RIVER
MUN PIER 19N-STP	PA002144 920318	SN	/ W			
MUN PIER 38S-OUTFALL 004	PA002144 920318	SN				DELAWARE RIVER
MUN PIER 40S-OUTFALL 005	PA002144 920318	SN				DELWARE RIVER
MUN PIER 40S-STP	PA002144 920318	SN	4 /	1,900		
MUN PIER 98S-OUTFALL 006	PA002144 920318	SN				DELAWARE RIVER
DUNKIN DONUTS						
DUNKIN' DONUTS-AIR STRIPP	PA005325 940210	IW	6 / 1K	8,640		
DUNKIN' DONUTS-STORM SEWE	PA005325 940210	IW				PENNYPACK CK
E I DU PONT DE NEMOU						
DUPONT-OUTFALL 001	PA001085 950321	IW				SCHUYKILL RIVER
DUPONT-OUTFALL 002-OUT OF	PA001085 950321	IW				SCHUYKILL RIVER
DUPONT-OUTFALL 003	PA001085 950321	IW				SCHUYKILL RIVER
EXXON CO U S A						
EXXON-DISCH TO MINGO CREE	PA001108 940601	IW				TRB MINGO CREEK
EXXON-DISCHARGE TO SCH RV	PA001108 940601	IW				SCHUYLKILL RVR
EXXON-LOWER YARD SEPARATO	PA001108 940601	IW	7 / 1H,1U			
EXXON-UPPER YARD SEPARATO	PA001108 940601	IW	7 / 1H			

DER DATA REPORT: Philadelphia County

Establishment Name / Facility Name	Permit #, Date	Prog.	Degree/Treatment Process	Avg. Flow	Max. Flow	Discharge Stream Name
JDM MATERIALS CO INC						
J.D.M. TYSDN-DISCHARGE 0	PA005018 840921	IW				DELAWARE RIVER
J.D.M. TYSON-SETTLING BA	PA005018 840921	IW	7 / 1U(2K-FUTURE)	3,000	5,000	
KEYSTONE TERMINAL OP						
GETTY-OIL/WATER SEPERATOR	PA003685 940519	IW	7 / IH			
GETTY-OUTFALL 001	PA003685 940519	IW				SCHUYKILL RIVER
METAL BANK OF AMERIC						
METAL BANK-LANDFILL	NO PM RE 0	IW				DELAWARE RIVER
MORRISSEY, J D CO						
J D MORRISSEY-DISCHARGE	NO PM RE 0	IW				PENNYPACK CR
MORRISSEY-PIT	NO PM RE 0	IW	/			
NABISCO						
NABISCO-STORM SEW OUTFALL	PA004456 910108	IW				WALTON RUN
NAT'L MILLING & CHEM						
NATL MILL-OUTFALL 001	PA002811 911021	IW				SCHUYKILL RIVER
NATL MILL-OUTFALL 001	PA002811 911021	IW				SCHUYKILL RIVER
NATL MILL-RIVER OUTFALL	PA002811 911021	IW				SCHUYKILL RIVER
NAT'L RAIL PASSENGER						
AMTRAK-DISCHARGE POINT 00	PA005050 840327	IW				SCHUYLKILL RIVE
AMTRAK-OIL SEPARATOR	PA005050 840327	IW	9 / 1Y	180,000		
PENNA TURNPIKE COMMI						
GULF OIL SEPARATOR 4B	PA001153 900918	IW	7 / 1H			
GULF OIL-DISCHARGE 002	PA001153 900918	IW				SCHUYLKILL RVR
GULF OIL-DP #004 ELLIOT C	PA001153 900918	IW				SCHUYLKILL RVR
GULF OIL-DP #011	PA001153 900918	IW				SCHUYLKILL RVR
GULF OIL-DP #013	PA001153 900918	IW				SCHUYKILL RIVER
GULF OIL-DP #014	PA001153 900918	IW				SCHUYLKILL RVR
GULF OIL-DP #015	PA001153 900918	IW				SCHUYLKILL RVR
GULF OIL-DP 001-TANK FARM	NO PM RE 0	IW				MINGO CREEK
GULF OIL-DP 009	PA001153 900918	IW				SCHUYKILL RIVER
GULF OIL-DP 010	PA001153 900918	IW				SCHUYLKILL RIV
GULF OIL-DP 012	PA001153 900918	IW				SCHUYLKILL RIV
GULF OIL-DP 005	PA001153 900918	IW				SCHUYLKILL RIV
GULF OIL-DP#001	PA001153 900918	IW				SCHUYLKILL RVR
GULF OIL-DP#006	PA001153 900918	IW				SCHUYLKILL RVR
GULF OIL-DP#007	PA001153 900918	IW				SCHUYLKILL RVR
GULF OIL-OUTFALL 003	PA001153 900918	IW				SCHHUYLKILL RIV
GULF OIL-SCHUYLKILL API S	NO PM RE 0	IW	7 / 1H	221,000	380,000	
GULF OIL-SEPARATOR #3	PA001153 900918	IW	7 / 1H			
GULF OIL-SEPARATOR 2A	PA001153 900918	IW	7 / 1H	4,900,000		
GULF OIL-SEPARATOR 2B	PA001153 900918	IW	7 / 1Y	8,770,000	12,400,000	
GULF OIL-SEPARATOR 4	PA001153 900918	IW	7 / 1H	901,000		
GULF OIL-SEPARATOR 4A	PA001153 900918	IW	7 / 1H			
GULF OIL-SEPARATOR 5	PA001153 900918	IW	7 / 1Y	8,770,000	12,400,000	
GULF OIL-SEPARATOR 6	PA001153 900918	IW	7 / 1H			
GULF OIL-SEPARATOR 7	PA001153 900918	IW	7 / 1Y	10,820,000	13,660,000	
GULF OIL-SEPARATOR 8	PA001153 900918	IW	7 / 1Y	37,000	82,000	
GULF OIL-WASTEWATER UNIT	PA001153 900918	IW	7 / 3H,3A	8,770,000	12,400,000	
PHILA AIRPORT CARGO						
PHIL CARGO CITY -OUTFALL	PA002590 930729	IW				DELAWARE RIVER
PHILA CARGO CITY -DIL SEP	PA002590 930729	IW	9 / 1H			
PHILA GAS WORKS						
PHILA GAS PLT A-DISCHARGE	PA004687 891012	IW				SCHUYLKILL RIV
PHILA GAS PLT B-DISCHARGE	PA001288 891018	IW				DELAWARE RIVER
PHILADELPHIA CITY W						
BAXTER-DP 001-TRAVELING S	PA005214 960103	IW				DELAWARE RVR
BAXTER-LAGOONS/SED.BASINS	PA005214 960103	IW	6 / IU	337,000	871,000	
BAXTWER-DP 002(LAGOON EFF	PA005214 960103	IW				PENNYPACK CK
PHILA NE-FRANKFORD GRIT C	PA002668 910828	SP	4 / 1W			
PHILA NE-OUTFALL 001	PA002668 910828	SP				DELAWARE RIVER
PHILA NORTHEAST TP-SECOND	PA002668 910828	SP	3 / 01,03,05,24,14			

DER DATA REPORT: Philadelphia County

Establishment Name / Facility Name	Permit #, Date		Prog.	Degree/Treatment Process	Avg. Flow	Max. Flow	Discharge Stream Name
PHILA SE-OUTFALL 001	PA002666	950529	SP				DELAWARE RIVER
PHILA SE-PRIMARY	PA002666	950529	SP	2 / 01,03,24,28			
PHILA SOUTHWEST-OUTFALL 0	PA002667	950507	SP				DELAWARE RIVER
PHILA SW STP-SEC. PURE OX	PA002667	950507	SP	4 / 01,03,05,11,16,28			
PHILA WATER-LAGOON	NO PM RE	0	IW	/			
PHILA WATER-OUTFALL PIPE	NO PM RE	0	IW				PENNYPACK CREEK
PHILA WATER-SCREEN BACKWA	NO PM RE	0	IW				DELAWARE RIVER
PHILADELPHIA COKE							
PHILA COKE-48"PIPE	NO PM RE	0	IW				DELAWARE RIVER
PHILA COKE-CW DISCH	NO PM RE	0	IW				DELAWARE RIVER
PHILA COKE-SETTLING BASIN	NO PM RE	0	IW	9 /			
PHILADELPHIA ELECTRI							
COOLERS 002	PA001164	900626	IW				DELAWARE RIVER
HEATING DRIPS 010	PA001162	900530	IW				DELAWARE RVR
PECO DELAWARE-DISCH 005	PA001162	900530	IW				DELAWARE RVR
PECO DELAWARE-DP #003	PA001162	900530	IW				DELAWARE RVR
PECO DELAWARE-DP#001 DISC	PA001162	900530	IW				DELAWARE RVR
PECO DELAWARE-DP#003	PA001162	900530	IW				DELAWARE RVR
PECO DELAWARE-DP#004	PA001162	900530	IW				DELAWARE RVR
PECO DELAWARE-DP#006 COND	PA001162	900530	IW				DELAWARE RIVER
PECO DELAWARE-DP#007	PA001162	900530	IW				DELAWARE RVR
PECO DELAWARE-DP#009	PA001162	900530	IW				DELAWARE RVR
PECO DELAWARE-IWTP	PA001162	900530	IW	7 / 2K,1U,1V	181,000		
PECO DELAWARE-IWTP EFFL.	PA001162	900530	IW				DELAWARE RIVER
PECO DELAWARE-OIL SEPARAT	PA001162	900530	IW	7 / 1Y	144,000		
PECO RICHMOND-DISCH 004	PA001164	900626	IW				DELAWARE RIVER
PECO RICHMOND-DP#001	PA001164	900626	IW				DELAWARE RIVER
PECO RICHMOND-OUTFALL 005	PA001164	900626	IW				DELAWARE RIVER
PECO RICHMOND-SETTLING BA	PA001164	900626	IW	7 / 1H,1U	392,000		
PECO SCHUYLKILL-BULKHEAD-	PA001165	920728	IW				SCHUYLKILL RIVE
PECO SOUTHWARK DISCH #107	PA001166	931017	IW				DELAWARE RVR
PECO SOUTHWARK DISCH #207	PA001166	931017	IW				DELAWARE RVR
PECO SOUTHWARK-DISCH #014	PA001166	931017	IW				DELAWARE RVR
PECO SOUTHWARK-DISCH #016	PA001166	931017	IW				DELAWARE RIVER
PECO SOUTHWARK-DISCH #104	PA001166	931017	IW				DELAWARE RVR
PECO SOUTHWARK-DP 010	PA001166	931017	IW				DELAWARE RIVER
PECO SOUTHWARK-DP 018	PA001166	931017	IW				DELAWARE RIVER
PECO SOUTHWARK-DP 108	PA001166	931017	IW				DELAWARE RIVER
PECO-CLEARWELL OVERFLOW 0	PA001166	931017	IW				DELAWARE RIVER
PECO-SCHUYLKILL-NEUTRAL T	PA001165	920728	IW	7 / 2C,2K	180,000		
SCREEN BACKWASH	PA001165	920728	IW	/ 1T	54,000		
SCREEN BACKWASH	PA001162	900530	IW	/ 1T	710,000		
SCREEN BACKWASH 003	PA001164	900626	IW				DELAWARE RIVER
VARIOUS COOLERS	PA001164	900626	IW	/ 1M	2,077,000	5,049,000	
YARD DRAIN 008	PA001162	900530	IW				DELAWARE RIVER
PHILADELPHIA INTNL A							
PHILA INTNL AIRPORT-DISCH	NO PM RE	0	IW				SCHUYLKILL R
PHILA INTNL AIRPORT-DISCH	NO PM RE	0	IW				SCHUYLKILL R
PHILA INTNL AIRPORT-DP	NO PM RE	0	IW				SCHUYLKILL RIV
PHILA INTNL AIRPORT-DP #	NO PM RE	0	IW				SCHUYLKILL RIVE
PUBLICKER DIST-DIV C							
PUBLICKER-OUTFALL #101	PA001331	0	IW				DELAWARE RIVER
PUBLICKER-OUTFALL #102	PA001331	0	IW				DELAWARE RIVER
PUBLICKER-OUTFALL #103	PA001331	0	IW				DELAWARE RIVER
PUBLICKER-OUTFALL #104	PA001331	0	IW				DELAWARE RIVER
ROHM & HAAS							
ROHM & HAAS BRIDESBGH-DP	PA001277	960927	IW				DELAWARE RIVER
ROHM & HAAS BRIDESBGH-DP#	PA001277	960927	IW				DELAWARE RIVER
ROHM & HAAS BRIDESBGH-DP#	PA001277	960927	IW				FRANKFORD INLET
ROHM & HAAS BRIDESBGH-DP#	PA001277	960927	IW				FRANKFORD INLET
ROHM & HAAS BRIDESBGH-DP#	PA001277	960927	IW				FRANKFORD INLET
ROHM & HAAS BRIDESBGH-DP#	PA001277	960927	IW				FRANKFORD INLET
ROHM & HAAS BRIDESBGH-DP#	PA001277	960927	IW				FRANKFORD INLET
ROHM & HAAS BRIDESBGH-DP#	PA001277	960927	IW				DELAWARE RIVER
ROHM & HAAS BRIDESBGH-PRE	PA001277	960927	IW	7 / 2K			
ROHM & HAAS BRIDESBGH-WAT	PA001277	960927	IW	7 /			

DER DATA REPORT: Philadelphia County

Establishment Name / Facility Name	Permit #, Date	Prog.	Degree/Treatment Process	Avg. Flow	Max. Flow	Discharge Stream Name
ROYAL PETROLEUM						
ROYAL PET-DP 001	PA004171 860424	IW				SCHUYLKILL RIVE
ROYAL PET-OIL SEPARATOR	PA004171 860424	IW	9 / 1Y			
UNITED STATES ENGINE						
US ARMY ENG-OUTFALL	NO PM RE 0	SN				DELAWARE RIVER
US ARMY ENG-STP	NO PM RE 0	SN	/			
US CORP ENG-SETTLNG BASIN	PA005031 921014	IW	9 / 1U			
US CORPS ENG-OUTFALL 001	PA005031 921014	IW				DELAWARE RIVER
US CORPS ENG-OUTFALL 002	PA005031 921014	IW				SCHUYKILL RIVER
US CORPS ENG-SETTLNG BASI	PA005031 921014	IW	9 / 1U			
UNITED STATES NAVY S						
NAVY SHIPYD ENG CTR-DISCH	PA003644 941106	IW				SCHUYKILL RIVR
NAVY SHIPYD ENG CTR-DISCH	PA003644 941106	IW				SCHUYKILL RIVER
NAVYYARD-BOILER HOUSE-DP	PA003645 900627	IW				SCHUYKILL RIVER
NAVYYARD-DRYDOCK #2-DP 00	PA003645 900627	IW				DELAWARE RIVER
NAVYYARD-DRYDOCK #3-DP 00	PA003645 900627	IW				DELAWARE RIVER
NAVYYARD-DRYDOCK 1-DP 004	PA003645 900627	IW				DELAWARE RIVER
NAVYYARD-DRYDOCK 4&5-DP 0	PA003645 900627	IW				DELAWARE RIVER
NAVYYARD-FOUNDRY BLDG-DP	PA003645 900627	IW				SCHUYKILL RIVER
NAVYYARD-STORM SEWER-DP 0	PA003645 900627	IW				DELAWARE RIVER
NAVYYARD-STORM SEWER-DP 0	PA003645 900627	IW				SCHUYKILL RIVER
NAVYYARD-STORM SEWER-DP 0	PA003645 900627	IW				DELAWARE RIVER
NAVYYARD-STORM SEWER-DP 0	PA003645 900627	IW				DELAWARE RIVER
NAVYYARD-STORM SEWER-DP 0	PA003645 900627	IW				DELAWARE RIVER
NAVYYARD-STORM SEWER-DP 0	PA003645 900627	IW				SCHUYKILL RIVER

APPENDIX D

Documentation Of Population, Land Use And Housing Data By Census Tract, Planning Analysis Section And Treatment Plant Service Area For 1980,1990,1996.

Polulation and Land Use Tables

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Population
- Summary by P.A.S. (1980-1990)
- Summary by P.A.S. (1990-1996)
- Breakdown by P.A.S. (1980-1990)
- Breakdown by P.A.S. (1990-1996)
- Breakdown by W.P.C.P. (1980-1990)
- Breakdown by W.P.C.P. (1990-1996)

Housing
Summary by P.A.S.
Breakdown by P.A.S.
Breakdown by W.P.C.P.

Land Use
Summary by P.A.S.
Breakdown by P.A.S.
Breakdown by W.P.C.P.

Note: P.A.S - Planning Analysis Section
W.P.C.P. - Water Pollution Control Plant

City of Philadelphia 1980-1990
Census Data Comparison
Summary Chart

Population

Planning Analysis Section	1980 Total Population	1990 Total Population	Percent Change 80 - 90	Total Acreage	1980 People per acre	1990 People per Acre
A	43,552	45,645	4.8	1,594	27.3	28.6
B	188,318	170,944	-9.2	8,691	21.7	19.7
C	86,328	81,885	-5.1	7,023	12.3	11.7
D	232,979	219,713	-5.7	8,888	26.2	24.7
E	170,611	146,491	-14.1	5,104	33.4	28.7
F	113,693	106,045	-6.7	3,827	29.7	27.7
G	100,865	94,715	-6.1	5,030	20.1	18.8
H	45,440	42,525	-6.4	4,002	11.4	10.6
I	110,455	103,266	-6.5	8,367	13.2	12.3
J	184,039	176,550	-4.1	5,584	33.0	31.6
K	248,559	237,251	-4.5	11,352	21.9	20.9
L	163,371	160,547	-1.7	17,021	9.6	9.4
Total:	**1,688,210**	**1,585,577**	**-6.1**	**86,483**	**19.5**	**18.3**

	Housing			
1980 Total Housing Units	1990 Total Housing Units	Percent Change 80 - 90	1980 Housing Density Persons/EDU	1990 Housing Density Persons/EDU
30,370	33,816	11.3	1.4	1.3
78,522	74,987	-4.5	2.4	2.3
32,156	31,433	-2.2	2.7	2.6
94,526	94,940	0.4	2.5	2.3
71,711	65,770	-8.3	2.4	2.2
43,855	39,366	-10.2	2.6	2.7
40,886	39,587	-3.2	2.5	2.4
18,247	19,430	6.5	2.5	2.2
48,224	46,851	-2.8	2.3	2.2
68,024	66,428	-2.3	2.7	2.7
99,929	100,289	0.4	2.5	2.4
55,981	61,962	10.7	2.9	2.6
682,431	**674,859**	**-1.1**	**2.5**	**2.3**

City of Philadelphia 1990-1996
Census Data Comparison
Summary Chart

Population

Planning Analysis Section	1990 Total Population	1996 Projected Population	Percent Change 90 - 96	Total Acreage	1990 People per acre	1996 People per Acre
A	45,645	47,334	3.7	1,594	28.6	29.7
B	170,944	164,128	-4.0	8,691	19.7	18.9
C	81,885	80,440	-1.8	7,023	11.7	11.5
D	219,713	215,529	-1.9	8,888	24.7	24.3
E	146,491	135,721	-7.4	5,104	28.7	26.6
F	106,045	103,854	-2.1	3,827	27.7	27.1
G	94,715	92,652	-2.2	5,030	18.8	18.4
H	42,525	41,547	-2.3	4,002	10.6	10.4
I	103,266	100,897	-2.3	8,367	12.3	12.1
J	176,550	174,758	-1.0	5,584	31.6	31.3
K	237,251	234,170	-1.3	11,352	20.9	20.6
L	160,547	160,158	-0.2	17,021	9.4	9.4
Total:	**1,585,577**	**1,551,188**	**-2.2**	**86,483**	**18.3**	**17.9**

Projections obtained from National Planning Data Corporation (1991)

	Housing			
1980 Total Housing Units	1990 Total Housing Units	Percent Change 80 - 90	1980 Housing Density Persons/EDU	1990 Housing Density Persons/EDU
30,370	33,816	11.3	1.4	1.3
78,522	74,987	-4.5	2.4	2.3
32,156	31,433	-2.2	2.7	2.6
94,526	94,940	0.4	2.5	2.3
71,711	65,770	-8.3	2.4	2.2
43,855	39,366	-10.2	2.6	2.7
40,886	39,587	-3.2	2.5	2.4
18,247	19,430	6.5	2.5	2.2
48,224	46,851	-2.8	2.3	2.2
68,024	66,428	-2.3	2.7	2.7
99,929	100,289	0.4	2.5	2.4
55,981	61,962	10.7	2.9	2.6
682,431	**674,859**	**-1.1**	**2.5**	**2.3**

City of Philadelphia 1980-1990
Census Data Comparison

newcen80.xls

Population

Planning Analysis Section	Tract No.	1980 Total Population	1990 Total Population	Percent Change 80 - 90	Tract Area Acres	1980 People per Acre	1990 People per acre	WWTP Service Area
A	1	656	2,073	216.0	175.2	3.7	11.8	SE
A	2	1,150	1,403	22.0	100.6	11.4	13.9	SE
A	3	2,160	2,427	12.4	139.1	15.5	17.4	SW
A	4	4,533	3,206	-29.3	129.2	35.1	24.8	SE/SW
A	5	461	1,055	128.9	106.5	4.3	9.9	SE
A	6	279	349	25.1	42.3	6.6	8.3	SE
A	7	2,448	3,069	25.4	62.0	39.5	49.5	SE
A	8	8,110	7,637	-5.8	99.1	81.8	77.1	SE
A	9	4,230	4,234	0.1	64.7	65.4	65.4	SE
A	10	5,213	5,715	9.6	174.2	29.9	32.8	SE
A	11	5,993	5,594	-6.7	91.9	65.2	60.9	SE
A	12	8,319	8,452	1.6	158.6	52.5	53.3	SE/SW
A	366	0	400	100.0	250.8	0.0	1.6	SE
A	366.99 *	0	31	100.0	N/A	N/A	N/A	SE
Subtotal:		**43,552**	**45,645**	**4.8**	**1,594.2**	**27.3**	**28.6**	
B	13	5,152	4,520	-12.3	177.7	29.0	25.4	SW
B	14	3,469	3,763	8.5	79.3	43.7	47.5	SE/SW
B	15	2,512	2,537	1.0	58.6	42.9	43.3	SE
B	16	1,837	1,943	5.8	49.4	37.2	39.3	SE
B	17	2,149	2,493	16.0	50.7	42.4	49.2	SE
B	18	3,625	3,247	-10.4	59.3	61.1	54.8	SE
B	19	3,788	2,419	-36.1	81.5	46.5	29.7	SE/SW

B	20	2,681	2,516	-6.2	71.9	37.3	35.0	SW
B	21	2,814	2,636	-6.3	58.8	47.9	44.8	SE/SW
B	22	2,262	2,195	-3.0	59.1	38.3	37.1	SE/SW
B	23	2,908	2,529	-13.0	52.6	55.3	48.1	SE
B	24	4,760	4,311	-9.4	132.0	36.1	32.7	SE
B	25	4,960	3,435	-30.7	98.6	50.3	34.8	SE
B	26	0	0	0.0	113.7	0.0	0.0	SE
B	27	8,576	7,365	-14.1	146.5	58.5	50.3	SE
B	28	9,632	8,968	-6.9	146.0	66.0	61.4	SE
B	29	5,163	4,017	-22.2	89.7	57.6	44.8	SE
B	30	8,090	8,364	3.4	117.6	68.8	71.1	SE/SW
B	31	6,422	5,902	-8.1	97.6	65.8	60.5	SW
B	32	6,926	6,147	-11.2	122.3	56.6	50.3	SW
B	33	7,271	6,128	-15.7	185.6	39.2	33.0	SW
B	34	557	466	-16.3	146.5	3.8	3.2	SW
B	35	123	95	-22.8	406.7	0.3	0.2	SW
B	36	7,813	7,429	-4.9	220.4	35.4	33.7	SW
B	37	11,021	10,373	-5.9	151.7	72.6	68.4	SW
B	38.99	4,640	4,092	-11.8	171.7	27.0	23.8	SW
B	39	13,576	11,853	-12.7	222.1	61.1	53.4	SE/SW
B	40	11,188	9,447	-15.6	160.1	69.9	59.0	SE
B	41	14,936	13,326	-10.8	191.8	77.9	69.5	SE
B	42	11,763	11,081	-5.8	198.4	59.3	55.9	SE
B	43	0	46	100.0	466.5	0.0	0.1	SE
B	43.99 *	58	0	-100.0	N/A	N/A	N/A	SE
B	44	1,253	1,078	-14.0	142.6	8.8	7.6	SE
B	45	3,609	3,255	-9.8	123.3	29.3	26.4	SE
B	46	3,072	2,391	-22.2	923.4	3.3	2.6	SE
B	47.98	4,663	4,370	-6.3	205.6	22.7	21.3	SE
B	48	584	526	-9.9	112.2	5.2	4.7	SE
B	49	2	0	-100.0	1,092.9	0.0	0.0	SE
B	50	3,019	2,229	-26.2	1,110.0	2.7	2.0	SE/SW
B	50.99 *	852	2,287	168.4	N/A	N/A	N/A	SE/SW
B	51	592	1,165	96.8	596.3	1.0	2.0	SW

Subtotal:		**188,318**	**170,944**	**-9.2**	**8,690.7**	**21.7**	**19.7**	
C	52	31	53	71.0	2,140.7	0.0	0.0	SW
C	54	935	1,271	35.9	436.6	2.1	2.9	SW
C	55	6,274	6,293	0.3	296.5	21.2	21.2	SW
C	56	1,259	1,217	-3.3	207.6	6.1	5.9	SW
C	57	81	3	-96.3	318.5	0.3	0.0	SW
C	58	0	32	100.0	838.9	0.0	0.0	SW
C	59	0	0	0.0	96.4	0.0	0.0	SW
C	60	6,848	6,554	-4.3	268.6	25.5	24.4	SW
C	61	3,548	3,146	-11.3	132.0	26.9	23.8	SW
C	62	4,292	4,038	-5.9	124.8	34.4	32.4	SW
C	63	4,468	4,709	5.4	137.1	32.6	34.3	SW
C	64	4,861	4,512	-7.2	163.8	29.7	27.5	SW
C	65	6,716	6,283	-6.4	286.4	23.4	21.9	SW
C	66	4,253	4,218	-0.8	162.1	26.2	26.0	SW
C	67	7,118	6,431	-9.7	248.3	28.7	25.9	SW
C	68	0	0	0.0	225.4	0.0	0.0	SW
C	69	2,974	2,520	-15.3	150.2	19.8	16.8	SW
C	70	5,633	5,374	-4.6	115.9	48.6	46.4	SW
C	71	10,371	9,952	-4.0	165.6	62.6	60.1	SW
C	72	6,476	6,112	-5.6	120.8	53.6	50.6	SW
C	73	4,227	3,722	-11.9	96.6	43.8	38.5	SW
C	74	5,963	5,445	-8.7	167.0	35.7	32.6	SW
C	75	0	0	0.0	123.1	0.0	0.0	SW
Subtotal:		**86,328**	**81,885**	**-5.1**	**7,022.9**	**12.3**	**11.7**	
D	76	1,774	416	-76.6	248.3	7.1	1.7	SW
D	77	1,898	2,253	18.7	80.3	23.6	28.1	SW
D	78	5,319	4,776	-10.2	107.2	49.6	44.6	SW
D	79	5,147	4,729	-8.1	93.2	55.2	50.7	SW
D	80	5,508	5,031	-8.7	105.8	52.1	47.6	SW

D	81	10,325	9,314	-9.8	152.0	67.9	61.3	SW
D	82	9,140	8,020	-12.3	206.1	44.3	38.9	SW
D	83	11,136	10,336	-7.2	232.8	47.8	44.4	SW
D	84	5,624	5,286	-6.0	122.8	45.8	43.0	SW
D	85	8,170	7,761	-5.0	154.2	53.0	50.3	SW
D	86	6,559	6,685	1.9	154.9	42.3	43.2	SW
D	87	7,210	7,249	0.5	133.2	54.1	54.4	SW
D	88	8,440	9,190	8.9	140.6	60.0	65.4	SW
D	89	2,246	2,786	24.0	216.0	10.4	12.9	SW
D	90	3,805	4,473	17.6	110.2	34.5	40.6	SW
D	91	2,722	2,968	9.0	103.5	26.3	28.7	SW
D	92	3,440	3,197	-7.1	127.3	27.0	25.1	SW
D	93	5,286	4,922	-6.9	99.6	53.1	49.4	SW
D	94	4,235	4,226	-0.2	92.2	45.9	45.8	SW
D	95	4,214	3,877	-8.0	80.1	52.6	48.4	SW
D	96	5,230	4,915	-6.0	101.3	51.6	48.5	SW
D	97	42	89	111.9	527.1	0.1	0.2	SW
D	98	7,677	7,271	-5.3	223.4	34.4	32.5	SW
D	99	380	366	-3.7	50.9	7.5	7.2	SW
D	100	4,455	3,882	-12.9	136.6	32.6	28.4	SW
D	101	6,867	6,389	-7.0	149.0	46.1	42.9	SW
D	102	3,256	3,231	-0.8	88.5	36.8	36.5	SW
D	103	3,168	2,933	-7.4	71.2	44.5	41.2	SW
D	104	4,421	4,251	-3.8	116.6	37.9	36.5	SW
D	105	5,297	4,535	-14.4	165.1	32.1	27.5	SW
D	106	2,132	1,622	-23.9	64.0	33.3	25.3	SW
D	107	4,718	4,166	-11.7	114.4	41.2	36.4	SW
D	108	5,969	4,727	-20.8	132.7	45.0	35.6	SW
D	109	3,143	2,503	-20.4	63.8	49.3	39.2	SW
D	110	4,767	4,591	-3.7	119.8	39.8	38.3	SW
D	111	5,727	5,333	-6.9	325.9	17.6	16.4	SW
D	112	6,672	6,547	-1.9	125.0	53.4	52.4	SW
D	113	3,802	3,545	-6.8	85.3	44.6	41.6	SW
D	114	7,537	7,232	-4.0	240.7	31.3	30.0	SW

D	115	4,364	3,776	-13.5	88.5	49.3	42.7	SW
D	116	3,433	2,997	-12.7	185.1	18.5	16.2	SW
D	117	1,942	2,088	7.5	164.1	11.8	12.7	SW
D	118	7,529	7,059	-6.2	232.3	32.4	30.4	SW
D	119	6,183	6,302	1.9	172.5	35.8	36.5	SW
D	120	1,747	1,781	1.9	148.0	11.8	12.0	SW
D	121	2,989	3,007	0.6	221.2	13.5	13.6	SW
D	122	7,249	6,955	-4.1	353.4	20.5	19.7	SW
D	123	85	117	37.6	1,362.5	0.1	0.1	SW
D	124	0	8	100.0	298.7	0.0	0.0	SW
Subtotal:		**232,979**	**219,713**	**-5.7**	**8,887.9**	**26.2**	**24.7**	
E	125	3,392	3,612	6.5	207.3	16.4	17.4	SE/SW
E	126	409	635	55.3	90.7	4.5	7.0	SE
E	127	378	399	5.6	83.3	4.5	4.8	SE
E	128	71	163	129.6	63.5	1.1	2.6	SE
E	129	288	430	49.3	89.5	3.2	4.8	SE
E	130	878	1,009	14.9	51.4	17.1	19.6	SE
E	131	2,772	2,200	-20.6	79.1	35.0	27.8	SE
E	132	4,722	4,166	-11.8	107.0	44.1	38.9	SE
E	133	2,676	2,264	-15.4	88.7	30.2	25.5	SE
E	134	5,694	5,401	-5.1	105.8	53.8	51.0	SE/SW
E	135	3,522	3,726	5.8	100.3	35.1	37.1	SE/SW
E	136	6,532	5,882	-10.0	99.8	65.5	58.9	SE/SW
E	137	7,220	6,573	-9.0	150.0	48.1	43.8	SE/SW
E	138	3,728	2,941	-21.1	87.0	42.9	33.8	SE/SW
E	139	5,404	4,785	-11.5	140.1	38.6	34.2	SE
E	140	4,622	3,594	-22.2	105.5	43.8	34.1	SE
E	141	3,536	2,768	-21.7	141.3	25.0	19.6	SE
E	142	2,232	2,190	-1.9	196.2	11.4	11.2	SE
E	144	3,362	3,331	-0.9	154.2	21.8	21.6	SE
E	145	2,764	2,006	-27.4	80.1	34.5	25.0	SE
E	146	3,086	3,322	7.6	112.7	27.4	29.5	SE

E	147	3,540	2,437	-31.2	85.5	41.4	28.5	SE
E	148	1,738	1,278	-26.5	47.2	36.8	27.1	SE
E	149	6,853	5,834	-14.9	110.0	62.3	53.0	SE/SW
E	150	10	97	870.0	588.8	0.0	0.2	SW
E	151	10,745	9,215	-14.2	187.1	57.4	49.3	SE/SW
E	152	11,241	8,134	-27.6	161.9	69.4	50.2	SE
E	153	5,308	3,621	-31.8	113.7	46.7	31.8	SE
E	154	2,150	1,819	-15.4	76.8	28.0	23.7	SE
E	155	4,565	3,413	-25.2	104.0	43.9	32.8	SE
E	156	2,857	2,386	-16.5	106.0	27.0	22.5	SE
E	157	2,628	2,764	5.2	122.3	21.5	22.6	SE
E	162	3,537	2,858	-19.2	86.2	41.0	33.2	SE
E	163	4,229	4,147	-1.9	139.6	30.3	29.7	SE
E	164	6,141	5,589	-9.0	118.4	51.9	47.2	SE/NE
E	165	5,095	3,870	-24.0	99.1	51.4	39.1	SE
E	166	1,788	1,475	-17.5	63.3	28.2	23.3	SE
E	167	10,391	8,509	-18.1	151.2	68.7	56.3	SE
E	168	5,903	5,370	-9.0	142.8	41.3	37.6	SE
E	169	14,604	12,278	-15.9	266.6	54.8	46.1	SE/SW
Subtotal:		**170,611**	**146,491**	**-14.1**	**5,104.0**	**33.4**	**28.7**	
F	170	4,532	3,927	-13.3	392.4	11.5	10.0	SE/SW
F	171	6,076	5,276	-13.2	282.9	21.5	18.6	SE/SW/NE
F	172	11,316	9,976	-11.8	138.4	81.8	72.1	SE/SW
F	173	3,993	3,815	-4.5	217.0	18.4	17.6	SE/SW/NE
F	174	3,780	3,406	-9.9	86.0	44.0	39.6	NE
F	175	9,663	9,010	-6.8	176.7	54.7	51.0	SE/NE
F	176	10,791	11,464	6.2	243.6	44.3	47.1	SE
F	194	281	361	28.5	332.6	0.8	1.1	NE
F	195	8,399	8,707	3.7	193.7	43.4	45.0	SE/NE
F	196	2,390	2,639	10.4	185.3	12.9	14.2	SE/NE
F	197	7,213	7,736	7.3	210.8	34.2	36.7	NE
F	198	7,486	6,966	-6.9	133.4	56.1	52.2	NE

F	199	5,827	5,390	-7.5	164.6	35.4	32.7	SE/NE
F	200	2,536	2,176	-14.2	79.6	31.9	27.3	NE
F	201	9,799	8,049	-17.9	215.7	45.4	37.3	NE
F	202	7,359	6,102	-17.1	188.8	39.0	32.3	SE/NE
F	203	4,752	3,780	-20.5	130.0	36.6	29.1	NE
F	204	4,217	3,805	-9.8	101.8	41.4	37.4	NE
F	205	3,283	3,460	5.4	354.1	9.3	9.8	SE/NE
Subtotal:		**113,693**	**106,045**	**-6.7**	**3,827.4**	**29.7**	**27.7**	
G	143	1,488	1,470	-1.2	136.9	10.9	10.7	SE
G	158	6,786	6,059	-10.7	147.0	46.2	41.2	SE
G	159	1,926	1,765	-8.4	171.5	11.2	10.3	SE
G	160	8,420	7,973	-5.3	176.4	47.7	45.2	SE
G	161	6,546	6,034	-7.8	172.0	38.1	35.1	SE
G	177	9,122	8,597	-5.8	176.4	51.7	48.7	SE/NE
G	178	6,881	6,252	-9.1	167.5	41.1	37.3	SE/NE
G	179	6,895	6,435	-6.7	167.8	41.1	38.3	NE
G	180	8,699	8,419	-3.2	201.1	43.3	41.9	NE
G	181	191	197	3.1	170.7	1.1	1.2	NE
G	182	382	375	-1.8	581.7	0.7	0.6	NE
G	182.99 *	43	0	-100.0	N/A	N/A	N/A	NE
G	183	4,501	4,225	-6.1	520.6	8.6	8.1	NE
G	184	2,328	2,306	-0.9	282.4	8.2	8.2	NE
G	185	147	134	-8.8	163.6	0.9	0.8	NE
G	186	5,163	4,821	-6.6	176.2	29.3	27.4	NE
G	187	1,834	1,773	-3.3	198.9	9.2	8.9	NE
G	188	7,432	7,167	-3.6	166.3	44.7	43.1	NE
G	189	1,077	1,013	-5.9	252.5	4.3	4.0	NE
G	190	6,761	6,428	-4.9	196.9	34.3	32.6	NE
G	191	6,748	6,060	-10.2	359.5	18.8	16.9	NE
G	192	7,364	7,078	-3.9	162.8	45.2	43.5	NE
G	193	131	134	2.3	280.7	0.5	0.5	NE

Subtotal:		**100,865**	**94,715**	**-6.1**	**5,029.4**	**20.1**	**18.8**	
H	209	3,473	3,080	-11.3	131.5	26.4	23.4	SW
H	210	5,770	5,505	-4.6	210.5	27.4	26.2	SW
H	211	2,981	2,608	-12.5	134.9	22.1	19.3	SW
H	212	2,702	2,474	-8.4	122.3	22.1	20.2	SW
H	213	4,148	3,830	-7.7	134.4	30.9	28.5	SW
H	214	4,417	3,867	-12.5	157.2	28.1	24.6	SW
H	215	3,924	3,542	-9.7	270.1	14.5	13.1	SW
H	216	1,479	1,464	-1.0	432.9	3.4	3.4	SW
H	217	7,158	6,376	-10.9	388.7	18.4	16.4	SW
H	218	4,267	4,053	-5.0	250.8	17.0	16.2	SW
H	219	1,494	1,404	-6.0	382.3	3.9	3.7	SW
H	220	1,147	1,600	39.5	719.1	1.6	2.2	SW
H	221	1,265	1,167	-7.7	161.9	7.8	7.2	SW
H	222	1,215	1,555	28.0	505.3	2.4	3.1	SW
Subtotal:		**45,440**	**42,525** OK	**-6.4**	**4,001.9**	**11.4**	**10.6**	OK
I	206	1,842	1,606	-12.8	317.8	5.8	5.1	SE/SW/NE
I	207	6,638	6,793	2.3	352.4	18.8	19.3	SE/SW
I	208	2,095	1,513	-27.8	221.7	9.4	6.8	SE/SW
I	223	68	374	450.0	1,372.4	0.0	0.3	SE/SW
I	224	375	335	-10.7	160.4	2.3	2.1	SW
I	225	765	506	-33.9	221.7	3.5	2.3	SW
I	226	479	472	-1.5	152.5	3.1	3.1	SW
I	227	1,307	1,423	8.9	141.6	9.2	10.0	SW
I	228	1,573	1,447	-8.0	174.2	9.0	8.3	SW
I	229	247	320	29.6	296.3	0.8	1.1	SE/SW
I	230	384	434	13.0	308.4	1.2	1.4	SE
I	231	1,347	1,293	-4.0	210.0	6.4	6.2	SE
I	232	690	870	26.1	193.7	3.6	4.5	SE
I	233	3,644	3,243	-11.0	147.5	24.7	22.0	SE
I	234	631	574	-9.0	200.2	3.2	2.9	SE

I	235	1,367	1,182	-13.5	196.4	7.0	6.0	SE
I	236	3,016	2,636	-12.6	241.7	12.5	10.9	SE
I	237	5,516	5,349	-3.0	267.4	20.6	20.0	SE/NE
I	238	4,941	4,650	-5.9	195.0	25.3	23.8	SE/NE
I	239	1,913	1,702	-11.0	121.1	15.8	14.1	SE
I	240	4,075	4,193	2.9	153.0	26.6	27.4	SE/NE
I	241	1,463	1,495	2.2	101.3	14.4	14.8	SE/NE
I	242	4,807	4,312	-10.3	132.7	36.2	32.5	NE
I	243	4,511	4,294	-4.8	167.0	27.0	25.7	NE
I	244	4,200	3,671	-12.6	103.8	40.5	35.4	NE
I	245	4,598	4,527	-1.5	199.4	23.1	22.7	NE
I	246	3,633	3,310	-8.9	153.2	23.7	21.6	NE
I	247	5,823	5,640	-3.1	231.8	25.1	24.3	NE
I	248	2,719	2,210	-18.7	80.6	33.7	27.4	NE
I	249	4,446	4,144	-6.8	80.3	55.4	51.6	NE
I	250	909	914	0.6	184.1	4.9	5.0	NE
I	251	2,448	2,275	-7.1	132.2	18.5	17.2	NE
I	252	8,268	7,379	-10.8	233.5	35.4	31.6	NE
I	253	4,911	4,315	-12.1	141.3	34.8	30.5	NE
I	254	4,977	4,548	-8.6	191.0	26.1	23.8	NE
I	255	3,067	2,898	-5.5	191.8	16.0	15.1	SE/NE
I	256	3,071	2,971	-3.3	214.7	14.3	13.8	SE/NE
I	257	3,691	3,448	-6.6	183.4	20.1	18.8	SE
Subtotal:		**110,455**	**103,266**	**-6.5**	**8,367.5**	**13.2**	**12.3**	
J	258	2,106	1,838	-12.7	144.3	14.6	12.7	SE/NE
J	259	5,862	5,511	-6.0	135.2	43.4	40.8	SE/NE
J	260	3,625	3,502	-3.4	133.9	27.1	26.2	NE
J	261	3,798	3,625	-4.6	164.3	23.1	22.1	NE
J	262	5,371	5,177	-3.6	137.1	39.2	37.8	NE
J	263	11,474	11,011	-4.0	272.8	42.1	40.4	NE
J	264	6,841	6,443	-5.8	196.9	34.7	32.7	NE
J	265	5,798	5,367	-7.4	136.4	42.5	39.3	NE

J	266	8,328	7,490	-10.1	222.4	37.4	33.7	NE
J	267	8,650	7,834	-9.4	158.9	54.4	49.3	NE
J	268	4,933	4,644	-5.9	189.5	26.0	24.5	NE
J	269	2,023	2,294	13.4	154.2	13.1	14.9	NE
J	270	2,474	2,275	-8.0	158.4	15.6	14.4	NE
J	271	2,206	2,455	11.3	93.2	23.7	26.3	NE
J	272	4,739	4,446	-6.2	162.8	29.1	27.3	NE
J	273	5,316	5,525	3.9	230.5	23.1	24.0	NE
J	274	8,911	9,620	8.0	207.6	42.9	46.3	NE
J	275	4,516	4,651	3.0	152.5	29.6	30.5	NE
J	276	4,595	4,250	-7.5	163.8	28.1	25.9	NE
J	277	5,984	5,358	-10.5	135.7	44.1	39.5	NE
J	278	6,005	5,262	-12.4	180.4	33.3	29.2	NE
J	279	8,549	7,901	-7.6	319.5	26.8	24.7	NE
J	280	5,463	5,219	-4.5	176.7	30.9	29.5	NE
J	281	4,581	4,377	-4.5	125.3	36.6	34.9	NE
J	282	6,034	6,016	-0.3	213.5	28.3	28.2	NE
J	283	9,895	8,746	-11.6	167.8	59.0	52.1	NE
J	284	6,881	5,865	-14.8	117.6	58.5	49.9	NE
J	285	2,157	2,259	4.7	70.7	30.5	32.0	NE
J	286	6,630	7,114	7.3	168.8	39.3	42.1	NE
J	287	2,299	2,468	7.4	87.5	26.3	28.2	NE
J	288	3,595	3,853	7.2	114.9	31.3	33.5	NE
J	289	8,963	8,484	-5.3	292.1	30.7	29.0	NE
J	290	5,437	5,670	4.3	198.7	27.4	28.5	NE
Subtotal:		**184,039**	**176,550**	**-4.1**	**5,583.9**	**33.0**	**31.6**	
K	291	4,263	4,461	4.6	334.8	12.7	13.3	NE
K	292	4,015	3,965	-1.2	421.1	9.5	9.4	NE
K	293	3,039	2,878	-5.3	172.2	17.6	16.7	NE
K	294	3,352	3,216	-4.1	164.6	20.4	19.5	NE
K	295	1,088	1,067	-1.9	156.9	6.9	6.8	NE
K	296	1,186	1,172	-1.2	58.3	20.3	20.1	NE

K	297	483	454	-6.0	176.2	2.7	2.6	NE
K	298	4,609	4,216	-8.5	160.4	28.7	26.3	NE
K	299	4,698	4,332	-7.8	147.8	31.8	29.3	NE
K	300	6,937	6,867	-1.0	225.4	30.8	30.5	NE
K	301	5,544	5,603	1.1	180.4	30.7	31.1	NE
K	302	6,616	6,514	-1.5	220.9	30.0	29.5	NE
K	303	7,715	6,947	-10.0	208.3	37.0	33.4	NE
K	304	508	631	24.2	307.4	1.7	2.1	NE
K	305	10,220	9,557	-6.5	264.2	38.7	36.2	NE
K	306	6,526	6,518	-0.1	247.1	26.4	26.4	NE
K	307	2,943	2,929	-0.5	158.6	18.6	18.5	NE
K	308	4,410	4,403	-0.2	195.2	22.6	22.6	NE
K	309	3,286	3,278	-0.2	158.9	20.7	20.6	NE
K	310	5,774	5,636	-2.4	266.4	21.7	21.2	NE
K	311	8,316	7,940	-4.5	185.1	44.9	42.9	NE
K	312	3,982	3,857	-3.1	102.3	38.9	37.7	NE
K	313	5,681	5,396	-5.0	178.2	31.9	30.3	NE
K	314	10,137	9,575	-5.5	280.5	36.1	34.1	NE
K	315	9,986	9,379	-6.1	293.3	34.0	32.0	NE
K	316	6,023	5,530	-8.2	180.9	33.3	30.6	NE
K	317	6,196	5,581	-9.9	217.0	28.6	25.7	NE
K	318	3,591	3,456	-3.8	117.9	30.5	29.3	NE
K	319	5,023	4,810	-4.2	188.8	26.6	25.5	NE
K	320	7,056	6,449	-8.6	171.0	41.3	37.7	NE
K	321	4,081	3,906	-4.3	136.4	29.9	28.6	NE
K	322	225	179	-20.4	138.4	1.6	1.3	NE
K	323	3,860	3,596	-6.8	150.2	25.7	23.9	NE
K	324	14	15	7.1	168.3	0.1	0.1	NE
K	325	6,011	5,747	-4.4	207.8	28.9	27.7	NE
K	326	7,195	6,733	-6.4	199.9	36.0	33.7	NE
K	327	284	307	8.1	340.8	0.8	0.9	NE
K	329	4,385	4,216	-3.9	233.0	18.8	18.1	NE
K	330	8,122	7,408	-8.8	184.1	44.1	40.2	NE
K	331	9,370	9,099	-2.9	294.3	31.8	30.9	NE

K	332	2,824	2,594	-8.1	207.1	13.6	12.5	NE
K	333	3,842	4,025	4.8	257.2	14.9	15.6	NE
K	334	4,812	4,456	-7.4	291.1	16.5	15.3	NE
K	335	3,481	3,400	-2.3	226.6	15.4	15.0	NE
K	336	6,751	6,148	-8.9	279.5	24.2	22.0	NE
K	337	9,671	9,025	-6.7	504.3	19.2	17.9	NE
K	338	5,655	5,461	-3.4	344.5	16.4	15.9	NE
K	339	3,044	2,862	-6.0	281.7	10.8	10.2	NE
K	340	2,820	2,518	-10.7	187.1	15.1	13.5	NE
K	341	5,775	5,567	-3.6	333.8	17.3	16.7	NE
K	342	3,134	3,369	7.5	245.1	12.8	13.7	NE
K	367 $	0	3	0.0	N/A	N/A	N/A	NE
Subtotal:		**248,559**	**237,251**	**-4.5**	**11,351.3**	**21.9**	**20.9**	
L	328	2,671	5,371	101.1	662.2	4.0	8.1	NE
L	343	171	168	-1.8	1,336.3	0.1	0.1	NE
L	344	8,641	7,792	-9.8	852.0	10.1	9.1	NE
L	345	5,852	7,947	35.8	355.6	16.5	22.3	NE
L	346	1,456	1,397	-4.1	453.7	3.2	3.1	NE
L	347	11,864	10,557	-11.0	530.8	22.4	19.9	NE
L	348	15,947	14,902	-6.6	967.7	16.5	15.4	NE
L	349	7,583	7,002	-7.7	483.3	15.7	14.5	NE
L	351	2,650	3,808	43.7	243.6	10.9	15.6	NE
L	352	4,896	4,580	-6.5	461.8	10.6	9.9	NE
L	353	11,617	10,742	-7.5	757.1	15.3	14.2	NE
L	354	5	31	520.0	1,889.9	0.0	0.0	NE
L	355	8,243	6,953	-15.6	576.0	14.3	12.1	NE
L	356	7,691	8,376	8.9	850.0	9.0	9.9	NE
L	357	8,763	8,670	-1.1	530.3	16.5	16.3	NE
L	358	7,172	6,113	-14.8	434.7	16.5	14.1	NE
L	359	4,298	5,454	26.9	558.5	7.7	9.8	NE
L	360	2,787	3,061	9.8	575.3	4.8	5.3	NE
L	361	4,764	4,046	-15.1	300.0	15.9	13.5	NE

L	362	19,565	17,971	-8.1	904.6	21.6	19.9	NE
L	363	17,998	15,723	-12.6	1,336.8	13.5	11.8	NE
L	364	1,261	547	-56.6	1,072.7	1.2	0.5	NE
L	365	7,476	9,336	24.9	888.3	8.4	10.5	NE
Subtotal:		**163,371**	**160,547**	**-1.7**	**17,021.2**	**9.6**	**9.4**	
Total:		**1,688,210**	**1,585,577**	**-6.1**	**86,482.3**	**19.5**	**18.3**	

* Population living on boats, adjacent to tract

$ One house, minimal acerage

City of Philadelphia 1990 - 1996
Census Data Comparison

Population

Planning Analysis Section	Tract No.	1990 Total Population	1996 Projected Population	Percent Change 90 - 96	Tract Area Acres	1990 People per Acre	1996 People per acre	WWTP Service Area
A	1	2,073	2,951	42.4	175.2	11.8	16.8	SE
A	2	1,403	1,480	5.5	100.6	13.9	14.7	SE
A	3	2,427	2,635	8.6	139.1	17.4	18.9	SW
A	4	3,206	2,672	-16.7	129.2	24.8	20.7	SE/SW
A	5	1,055	1,406	33.3	106.5	9.9	13.2	SE
A	6	349	342	-2.0	42.3	8.3	8.1	SE
A	7	3,069	3,415	11.3	62.0	49.5	55.1	SE
A	8	7,637	7,414	-2.9	99.1	77.1	74.8	SE
A	9	4,234	4,434	4.7	64.7	65.4	68.5	SE
A	10	5,715	6,158	7.8	174.2	32.8	35.4	SE
A	11	5,594	5,376	-3.9	91.9	60.9	58.5	SE
A	12	8,452	8,620	2.0	158.6	53.3	54.4	SE/SW
A	366	400	400	0.0	250.8	1.6	1.6	SE
A	366.99 *	31	31	0.0	N/A	N/A	N/A	SE
Subtotal:		**45,645**	**47,334**	**3.7**	**1,594.2**	**28.6**	**29.7**	
B	13	4,520	4,243	-6.1	177.7	25.4	23.9	SW
B	14	3,763	3,941	4.7	79.3	47.5	49.7	SE/SW
B	15	2,537	2,568	1.2	58.6	43.3	43.8	SE
B	16	1,943	2,430	25.1	49.4	39.3	49.2	SE
B	17	2,493	2,951	18.4	50.7	49.2	58.2	SE
B	18	3,247	3,089	-4.9	59.3	54.8	52.1	SE
B	19	2,419	1,902	-21.4	81.5	29.7	23.3	SE/SW

B	20	2,516	2,459	-2.3	71.9	35.0	34.2	SW
B	21	2,636	2,577	-2.2	58.8	44.8	43.8	SE/SW
B	22	2,195	2,163	-1.5	59.1	37.1	36.6	SE/SW
B	23	2,529	2,375	-6.1	52.6	48.1	45.2	SE
B	24	4,311	4,125	-4.3	132.0	32.7	31.3	SE
B	25	3,435	2,849	-17.1	98.6	34.8	28.9	SE
B	26	0	0	0.0	113.7	0.0	0.0	SE
B	27	7,365	6,825	-7.3	146.5	50.3	46.6	SE
B	28	8,968	8,714	-2.8	146.0	61.4	59.7	SE
B	29	4,017	3,535	-12.0	89.7	44.8	39.4	SE
B	30	8,364	8,660	3.5	117.6	71.1	73.6	SE/SW
B	31	5,902	5,701	-3.4	97.6	60.5	58.4	SW
B	32	6,147	5,814	-5.4	122.3	50.3	47.5	SW
B	33	6,128	5,647	-7.8	185.6	33.0	30.4	SW
B	34	466	428	-8.2	146.5	3.2	2.9	SW
B	35	95	83	-12.6	406.7	0.2	0.2	SW
B	36	7,429	7,330	-1.3	220.4	33.7	33.3	SW
B	37	10,373	10,163	-2.0	151.7	68.4	67.0	SW
B	38.99	4,092	3,861	-5.6	171.7	23.8	22.5	SW
B	39	11,853	11,159	-5.9	222.1	53.4	50.2	SE/SW
B	40	9,447	8,723	-7.7	160.1	59.0	54.5	SE
B	41	13,326	12,621	-5.3	191.8	69.5	65.8	SE
B	42	11,081	10,791	-2.6	198.4	55.9	54.4	SE
B	43	46	75	63.0	466.5	0.1	0.2	SE
B	43.99 *	0	0	0.0	N/A	N/A	N/A	SE
B	44	1,078	1,003	-7.0	142.6	7.6	7.0	SE
B	45	3,255	3,111	-4.4	123.3	26.4	25.2	SE
B	46	2,391	2,112	-11.7	923.4	2.6	2.3	SE
B	47.98	4,370	4,285	-1.9	205.6	21.3	20.8	SE
B	48	526	477	-9.3	112.2	4.7	4.3	SE
B	49	0	0	0.0	1,092.9	0.0	0.0	SE
B	50	2,229	1,927	-13.5	1,110.0	2.0	1.7	SE/SW
B	50.99 *	2,287	2,141	-6.4	N/A	N/A	N/A	SE/SW
B	51	1,165	1,270	9.0	596.3	2.0	2.1	SW

Subtotal:		**170,944**	**164,128**	**-4.0**	**8,690.7**	**19.7**	**18.9**	
C	52	53	67	26.4	2,140.7	0.0	0.0	SW
C	54	1,271	1,493	17.5	436.6	2.9	3.4	SW
C	55	6,293	6,397	1.7	296.5	21.2	21.6	SW
C	56	1,217	1,209	-0.7	207.6	5.9	5.8	SW
C	57	3	0	-100.0	318.5	0.0	0.0	SW
C	58	32	52	62.5	838.9	0.0	0.1	SW
C	59	0	0	0.0	96.4	0.0	0.0	SW
C	60	6,554	6,480	-1.1	268.6	24.4	24.1	SW
C	61	3,146	2,978	-5.3	132.0	23.8	22.6	SW
C	62	4,038	3,953	-2.1	124.8	32.4	31.7	SW
C	63	4,709	4,730	0.4	137.1	34.3	34.5	SW
C	64	4,512	4,374	-3.1	163.8	27.5	26.7	SW
C	65	6,283	6,137	-2.3	286.4	21.9	21.4	SW
C	66	4,218	4,251	0.8	162.1	26.0	26.2	SW
C	67	6,431	6,159	-4.2	248.3	25.9	24.8	SW
C	68	0	0	0.0	225.4	0.0	0.0	SW
C	69	2,520	2,324	-7.8	150.2	16.8	15.5	SW
C	70	5,374	5,275	-1.8	115.9	46.4	45.5	SW
C	71	9,952	9,859	-0.9	165.6	60.1	59.5	SW
C	72	6,112	5,963	-2.4	120.8	50.6	49.4	SW
C	73	3,722	3,506	-5.8	96.6	38.5	36.3	SW
C	74	5,445	5,233	-3.9	167.0	32.6	31.3	SW
C	75	0	0	0.0	123.1	0.0	0.0	SW
Subtotal:		**81,885**	**80,440**	**-1.8**	**7,022.9**	**11.7**	**11.5**	
D	76	416	389	-6.5	248.3	1.7	1.6	SW
D	77	2,253	2,236	-0.8	80.3	28.1	27.8	SW
D	78	4,776	4,498	-5.8	107.2	44.6	42.0	SW
D	79	4,729	4,565	-3.5	93.2	50.7	49.0	SW
D	80	5,031	4,746	-5.7	105.8	47.6	44.9	SW

D	81	9,314	8,902	-4.4	152.0	61.3	58.6	SW
D	82	8,020	7,527	-6.1	206.1	38.9	36.5	SW
D	83	10,336	10,029	-3.0	232.8	44.4	43.1	SW
D	84	5,286	5,161	-2.4	122.8	43.0	42.0	SW
D	85	7,761	7,623	-1.8	154.2	50.3	49.4	SW
D	86	6,685	6,837	2.3	154.9	43.2	44.1	SW
D	87	7,249	7,410	2.2	133.2	54.4	55.6	SW
D	88	9,190	9,600	4.5	140.6	65.4	68.3	SW
D	89	2,786	2,904	4.2	216.0	12.9	13.4	SW
D	90	4,473	5,070	13.3	110.2	40.6	46.0	SW
D	91	2,968	3,125	5.3	103.5	28.7	30.2	SW
D	92	3,197	3,098	-3.1	127.3	25.1	24.3	SW
D	93	4,922	4,784	-2.8	99.6	49.4	48.0	SW
D	94	4,226	4,255	0.7	92.2	45.8	46.1	SW
D	95	3,877	3,745	-3.4	80.1	48.4	46.8	SW
D	96	4,915	4,798	-2.4	101.3	48.5	47.4	SW
D	97	89	118	32.6	527.1	0.2	0.2	SW
D	98	7,271	7,146	-1.7	223.4	32.5	32.0	SW
D	99	366	364	-0.5	50.9	7.2	7.2	SW
D	100	3,882	3,599	-7.3	136.6	28.4	26.3	SW
D	101	6,389	6,192	-3.1	149.0	42.9	41.6	SW
D	102	3,231	3,262	1.0	88.5	36.5	36.9	SW
D	103	2,933	2,843	-3.1	71.2	41.2	39.9	SW
D	104	4,251	4,171	-1.9	116.6	36.5	35.8	SW
D	105	4,535	4,213	-7.1	165.1	27.5	25.5	SW
D	106	1,622	1,467	-9.6	64.0	25.3	22.9	SW
D	107	4,166	3,946	-5.3	114.4	36.4	34.5	SW
D	108	4,727	4,183	-11.5	132.7	35.6	31.5	SW
D	109	2,503	2,242	-10.4	63.8	39.2	35.1	SW
D	110	4,591	4,534	-1.2	119.8	38.3	37.8	SW
D	111	5,333	5,190	-2.7	325.9	16.4	15.9	SW
D	112	6,547	6,580	0.5	125.0	52.4	52.6	SW
D	113	3,545	3,446	-2.8	85.3	41.6	40.4	SW
D	114	7,232	7,168	-0.9	240.7	30.0	29.8	SW

D	115	3,776	3,525	-6.6	88.5	42.7	39.8	SW
D	116	2,997	2,882	-3.8	185.1	16.2	15.6	SW
D	117	2,088	1,763	-15.6	164.1	12.7	10.7	SW
D	118	7,059	6,919	-2.0	232.3	30.4	29.8	SW
D	119	6,302	6,478	2.8	172.5	36.5	37.6	SW
D	120	1,781	1,832	2.9	148.0	12.0	12.4	SW
D	121	3,007	3,037	1.0	221.2	13.6	13.7	SW
D	122	6,955	7,001	0.7	353.4	19.7	19.8	SW
D	123	117	119	1.7	1,362.5	0.1	0.1	SW
D	124	8	7	-12.5	298.7	0.0	0.0	SW
Subtotal:		**219,713**	**215,529**	**-1.9**	**8,887.9**	**24.7**	**24.2**	
E	125	3,612	3,697	2.4	207.3	17.4	17.8	SE/SW
E	126	635	784	23.5	90.7	7.0	8.6	SE
E	127	399	416	4.3	83.3	4.8	5.0	SE
E	128	163	220	35.0	63.5	2.6	3.5	SE
E	129	430	552	28.4	89.5	4.8	6.2	SE
E	130	1,009	1,117	10.7	51.4	19.6	21.7	SE
E	131	2,200	1,988	-9.6	79.1	27.8	25.1	SE
E	132	4,166	3,604	-13.5	107.0	38.9	33.7	SE
E	133	2,264	1,990	-12.1	88.7	25.5	22.4	SE
E	134	5,401	5,295	-2.0	105.8	51.0	50.0	SE/SW
E	135	3,726	3,844	3.2	100.3	37.1	38.3	SE/SW
E	136	5,882	5,604	-4.7	99.8	58.9	56.2	SE/SW
E	137	6,573	6,237	-5.1	150.0	43.8	41.6	SE/SW
E	138	2,941	2,597	-11.7	87.0	33.8	29.9	SE/SW
E	139	4,785	4,298	-10.2	140.1	34.2	30.7	SE
E	140	3,594	3,122	-13.1	105.5	34.1	29.6	SE
E	141	2,768	2,434	-12.1	141.3	19.6	17.2	SE
E	142	2,190	2,191	0.0	196.2	11.2	11.2	SE
E	144	3,331	3,369	1.1	154.2	21.6	21.8	SE
E	145	2,006	1,708	-14.9	80.1	25.0	21.3	SE
E	146	3,322	3,081	-7.3	112.7	29.5	27.3	SE

E	147	2,437	1,895	-22.2	85.5	28.5	22.2	SE
E	148	1,278	1,058	-17.2	47.2	27.1	22.4	SE
E	149	5,834	5,397	-7.5	110.0	53.0	49.1	SE/SW
E	150	97	152	56.7	588.8	0.2	0.3	SW
E	151	9,215	8,543	-7.3	187.1	49.3	45.7	SE/SW
E	152	8,134	6,827	-16.1	161.9	50.2	42.2	SE
E	153	3,621	2,970	-18.0	113.7	31.8	26.1	SE
E	154	1,819	1,851	1.8	76.8	23.7	24.1	SE
E	155	3,413	2,951	-13.5	104.0	32.8	28.4	SE
E	156	2,386	2,192	-8.1	106.0	22.5	20.7	SE
E	157	2,764	2,893	4.7	122.3	22.6	23.7	SE
E	162	2,858	2,554	-10.6	86.2	33.2	29.6	SE
E	163	4,147	4,168	0.5	139.6	29.7	29.9	SE
E	164	5,589	5,374	-3.8	118.4	47.2	45.4	SE/NE
E	165	3,870	3,323	-14.1	99.1	39.1	33.5	SE
E	166	1,475	1,332	-9.7	63.3	23.3	21.0	SE
E	167	8,509	7,670	-9.9	151.2	56.3	50.7	SE
E	168	5,370	5,155	-4.0	142.8	37.6	36.1	SE
E	169	12,278	11,268	-8.2	266.6	46.1	42.3	SE/SW
Subtotal:		**146,491**	**135,721**	**-7.4**	**5,104.0**	**28.7**	**26.6**	
F	170	3,927	3,702	-5.7	392.4	10.0	9.4	SE/SW
F	171	5,276	4,954	-6.1	282.9	18.6	17.5	SE/SW/NE
F	172	9,976	9,426	-5.5	138.4	72.1	68.1	SE/SW
F	173	3,815	3,768	-1.2	217.0	17.6	17.4	SE/SW/NE
F	174	3,406	3,252	-4.5	86.0	39.6	37.8	NE
F	175	9,010	8,779	-2.6	176.7	51.0	49.7	SE/NE
F	176	11,464	12,055	5.2	243.6	47.1	49.5	SE
F	194	361	417	15.5	332.6	1.1	1.3	NE
F	195	8,707	9,029	3.7	193.7	45.0	46.6	SE/NE
F	196	2,639	2,828	7.2	185.3	14.2	15.3	SE/NE
F	197	7,736	8,186	5.8	210.8	36.7	38.8	NE
F	198	6,966	6,778	-2.7	133.4	52.2	50.8	NE

F	199	5,390	5,207	-3.4	164.6	32.7	31.6	SE/NE
F	200	2,176	1,971	-9.4	79.6	27.3	24.8	NE
F	201	8,049	7,329	-8.9	215.7	37.3	34.0	NE
F	202	6,102	5,596	-8.3	188.8	32.3	29.6	SE/NE
F	203	3,780	3,334	-11.8	130.0	29.1	25.6	NE
F	204	3,805	3,643	-4.3	101.8	37.4	35.8	NE
F	205	3,460	3,600	4.0	354.1	9.8	10.2	SE/NE
Subtotal:		**106,045**	**103,854**	**-2.1**	**3,827.4**	**27.7**	**27.1**	
G	143	1,470	1,445	-1.7	136.9	10.7	10.6	SE
G	158	6,059	5,748	-5.1	147.0	41.2	39.1	SE
G	159	1,765	1,701	-3.6	171.5	10.3	9.9	SE
G	160	7,973	7,841	-1.7	176.4	45.2	44.5	SE
G	161	6,034	5,834	-3.3	172.0	35.1	33.9	SE
G	177	8,597	8,414	-2.1	176.4	48.7	47.7	SE/NE
G	178	6,252	5,991	-4.2	167.5	37.3	35.8	SE/NE
G	179	6,435	6,233	-3.1	167.8	38.3	37.1	NE
G	180	8,419	8,388	-0.4	201.1	41.9	41.7	NE
G	181	197	203	3.0	170.7	1.2	1.2	NE
G	182	375	376	0.3	581.7	0.6	0.6	NE
G	182.99 *	0	0	0.0	N/A	N/A	N/A	NE
G	183	4,225	4,136	-2.1	520.6	8.1	7.9	NE
G	184	2,306	2,325	0.8	282.4	8.2	8.2	NE
G	185	134	129	-3.7	163.6	0.8	0.8	NE
G	186	4,821	4,711	-2.3	176.2	27.4	26.7	NE
G	187	1,773	1,804	1.7	198.9	8.9	9.1	NE
G	188	7,167	7,113	-0.8	166.3	43.1	42.8	NE
G	189	1,013	1,014	0.1	252.5	4.0	4.0	NE
G	190	6,428	6,326	-1.6	196.9	32.6	32.1	NE
G	191	6,060	5,774	-4.7	359.5	16.9	16.1	NE
G	192	7,078	7,008	-1.0	162.8	43.5	43.0	NE
G	193	134	138	3.0	280.7	0.5	0.5	NE

Subtotal:		**94,715**	**92,652**	**-2.2**	**5,029.4**	**18.8**	**18.4**	
H	209	3,080	2,899	-5.9	131.5	23.4	22.0	SW
H	210	5,505	5,417	-1.6	210.5	26.2	25.7	SW
H	211	2,608	2,462	-5.6	134.9	19.3	18.3	SW
H	212	2,474	2,380	-3.8	122.3	20.2	19.5	SW
H	213	3,830	3,673	-4.1	134.4	28.5	27.3	SW
H	214	3,867	3,629	-6.2	157.2	24.6	23.1	SW
H	215	3,542	3,390	-4.3	270.1	13.1	12.6	SW
H	216	1,464	1,476	0.8	432.9	3.4	3.4	SW
H	217	6,376	6,098	-4.4	388.7	16.4	15.7	SW
H	218	4,053	3,983	-1.7	250.8	16.2	15.9	SW
H	219	1,404	1,373	-2.2	382.3	3.7	3.6	SW
H	220	1,600	1,845	15.3	719.1	2.2	2.6	SW
H	221	1,167	1,135	-2.7	161.9	7.2	7.0	SW
H	222	1,555	1,787	14.9	505.3	3.1	3.5	SW
Subtotal:		**42,525**	**41,547**	**-2.3**	**4,001.9**	**10.6**	**10.4**	
I	206	1,606	1,501	-6.5	317.8	5.1	4.7	SE/SW/NE
I	207	6,793	6,964	2.5	352.4	19.3	19.8	SE/SW
I	208	1,513	1,385	-8.5	221.7	6.8	6.2	SE/SW
I	223	374	361	-3.5	1,372.4	0.3	0.3	SE/SW
I	224	335	321	-4.2	160.4	2.1	2.0	SW
I	225	506	536	5.9	221.7	2.3	2.4	SW
I	226	472	452	-4.2	152.5	3.1	3.0	SW
I	227	1,423	1,514	6.4	141.6	10.0	10.7	SW
I	228	1,447	1,400	-3.2	174.2	8.3	8.0	SW
I	229	320	370	15.6	296.3	1.1	1.2	SE/SW
I	230	434	393	-9.4	308.4	1.4	1.3	SE
I	231	1,293	1,280	-1.0	210.0	6.2	6.1	SE
I	232	870	993	14.1	193.7	4.5	5.1	SE
I	233	3,243	3,076	-5.1	147.5	22.0	20.9	SE
I	234	574	552	-3.8	200.2	2.9	2.8	SE

I	235	1,182	1,101	-6.9	196.4	6.0	5.6	SE
I	236	2,636	2,511	-4.7	241.7	10.9	10.4	SE
I	237	5,349	5,141	-3.9	267.4	20.0	19.2	SE/NE
I	238	4,650	4,518	-2.8	195.0	23.8	23.2	SE/NE
I	239	1,702	1,608	-5.5	121.1	14.1	13.3	SE
I	240	4,193	4,293	2.4	153.0	27.4	28.1	SE/NE
I	241	1,495	1,575	5.4	101.3	14.8	15.5	SE/NE
I	242	4,312	4,093	-5.1	132.7	32.5	30.8	NE
I	243	4,294	4,228	-1.5	167.0	25.7	25.3	NE
I	244	3,671	3,456	-5.9	103.8	35.4	33.3	NE
I	245	4,527	4,591	1.4	199.4	22.7	23.0	NE
I	246	3,310	3,194	-3.5	153.2	21.6	20.8	NE
I	247	5,640	5,615	-0.4	231.8	24.3	24.2	NE
I	248	2,210	1,978	-10.5	80.6	27.4	24.5	NE
I	249	4,144	4,038	-2.6	80.3	51.6	50.3	NE
I	250	914	857	-6.2	184.1	5.0	4.7	NE
I	251	2,275	2,210	-2.9	132.2	17.2	16.7	NE
I	252	7,379	7,088	-3.9	233.5	31.6	30.4	NE
I	253	4,315	4,061	-5.9	141.3	30.5	28.7	NE
I	254	4,548	4,375	-3.8	191.0	23.8	22.9	NE
I	255	2,898	2,851	-1.6	191.8	15.1	14.9	SE/NE
I	256	2,971	3,008	1.2	214.7	13.8	14.0	SE/NE
I	257	3,448	3,409	-1.1	183.4	18.8	18.6	SE
Subtotal:		**103,266**	**100,897**	-2.3	**8,367.5**	**12.3**	**12.1**	
J	258	1,838	1,724	-6.2	144.3	12.7	11.9	SE/NE
J	259	5,511	5,391	-2.2	135.2	40.8	39.9	SE/NE
J	260	3,502	3,482	-0.6	133.9	26.2	26.0	NE
J	261	3,625	3,577	-1.3	164.3	22.1	21.8	NE
J	262	5,177	5,141	-0.7	137.1	37.8	37.5	NE
J	263	11,011	10,912	-0.9	272.8	40.4	40.0	NE
J	264	6,443	6,313	-2.0	196.9	32.7	32.1	NE
J	265	5,367	5,205	-3.0	136.4	39.3	38.2	NE

J	266	7,490	7,148	-4.6	222.4	33.7	32.1	NE
J	267	7,834	7,511	-4.1	158.9	49.3	47.3	NE
J	268	4,644	4,447	-4.2	189.5	24.5	23.5	NE
J	269	2,294	2,334	1.7	154.2	14.9	15.1	NE
J	270	2,275	2,203	-3.2	158.4	14.4	13.9	NE
J	271	2,455	2,642	7.6	93.2	26.3	28.3	NE
J	272	4,446	4,345	-2.3	162.8	27.3	26.7	NE
J	273	5,525	5,733	3.8	230.5	24.0	24.9	NE
J	274	9,620	10,189	5.9	207.6	46.3	49.1	NE
J	275	4,651	4,801	3.2	152.5	30.5	31.5	NE
J	276	4,250	4,220	-0.7	163.8	25.9	25.8	NE
J	277	5,358	5,106	-4.7	135.7	39.5	37.6	NE
J	278	5,262	4,908	-6.7	180.4	29.2	27.2	NE
J	279	7,901	7,564	-4.3	319.5	24.7	23.7	NE
J	280	5,219	5,157	-1.2	176.7	29.5	29.2	NE
J	281	4,377	4,321	-1.3	125.3	34.9	34.5	NE
J	282	6,016	5,915	-1.7	213.5	28.2	27.7	NE
J	283	8,746	8,262	-5.5	167.8	52.1	49.2	NE
J	284	5,865	5,435	-7.3	117.6	49.9	46.2	NE
J	285	2,259	2,355	4.2	70.7	32.0	33.3	NE
J	286	7,114	7,499	5.4	168.8	42.1	44.4	NE
J	287	2,468	2,606	5.6	87.5	28.2	29.8	NE
J	288	3,853	4,072	5.7	114.9	33.5	35.4	NE
J	289	8,484	8,335	-1.8	292.1	29.0	28.5	NE
J	290	5,670	5,905	4.1	198.7	28.5	29.7	NE
Subtotal:		**176,550**	**174,758**	**-1.0**	**5,583.9**	**31.6**	**31.3**	
K	291	4,461	4,647	4.2	334.8	13.3	13.9	NE
K	292	3,965	3,989	0.6	421.1	9.4	9.5	NE
K	293	2,878	2,833	-1.6	172.2	16.7	16.5	NE
K	294	3,216	3,183	-1.0	164.6	19.5	19.3	NE
K	295	1,067	1,070	0.3	156.9	6.8	6.8	NE
K	296	1,172	1,181	0.8	58.3	20.1	20.3	NE

F	199	5,390	5,207	-3.4	164.6	32.7	31.6	SE/NE
F	200	2,176	1,971	-9.4	79.6	27.3	24.8	NE
F	201	8,049	7,329	-8.9	215.7	37.3	34.0	NE
F	202	6,102	5,596	-8.3	188.8	32.3	29.6	SE/NE
F	203	3,780	3,334	-11.8	130.0	29.1	25.6	NE
F	204	3,805	3,643	-4.3	101.8	37.4	35.8	NE
F	205	3,460	3,600	4.0	354.1	9.8	10.2	SE/NE
Subtotal:		**106,045**	**103,854**	**-2.1**	**3,827.4**	**27.7**	**27.1**	
G	143	1,470	1,445	-1.7	136.9	10.7	10.6	SE
G	158	6,059	5,748	-5.1	147.0	41.2	39.1	SE
G	159	1,765	1,701	-3.6	171.5	10.3	9.9	SE
G	160	7,973	7,841	-1.7	176.4	45.2	44.5	SE
G	161	6,034	5,834	-3.3	172.0	35.1	33.9	SE
G	177	8,597	8,414	-2.1	176.4	48.7	47.7	SE/NE
G	178	6,252	5,991	-4.2	167.5	37.3	35.8	SE/NE
G	179	6,435	6,233	-3.1	167.8	38.3	37.1	NE
G	180	8,419	8,388	-0.4	201.1	41.9	41.7	NE
G	181	197	203	3.0	170.7	1.2	1.2	NE
G	182	375	376	0.3	581.7	0.6	0.6	NE
G	182.99 *	0	0	0.0	N/A	N/A	N/A	NE
G	183	4,225	4,136	-2.1	520.6	8.1	7.9	NE
G	184	2,306	2,325	0.8	282.4	8.2	8.2	NE
G	185	134	129	-3.7	163.6	0.8	0.8	NE
G	186	4,821	4,711	-2.3	176.2	27.4	26.7	NE
G	187	1,773	1,804	1.7	198.9	8.9	9.1	NE
G	188	7,167	7,113	-0.8	166.3	43.1	42.8	NE
G	189	1,013	1,014	0.1	252.5	4.0	4.0	NE
G	190	6,428	6,326	-1.6	196.9	32.6	32.1	NE
G	191	6,060	5,774	-4.7	359.5	16.9	16.1	NE
G	192	7,078	7,008	-1.0	162.8	43.5	43.0	NE
G	193	134	138	3.0	280.7	0.5	0.5	NE

Subtotal:		**94,715**	**92,652**	**-2.2**	**5,029.4**	**18.8**	**18.4**	
H	209	3,080	2,899	-5.9	131.5	23.4	22.0	SW
H	210	5,505	5,417	-1.6	210.5	26.2	25.7	SW
H	211	2,608	2,462	-5.6	134.9	19.3	18.3	SW
H	212	2,474	2,380	-3.8	122.3	20.2	19.5	SW
H	213	3,830	3,673	-4.1	134.4	28.5	27.3	SW
H	214	3,867	3,629	-6.2	157.2	24.6	23.1	SW
H	215	3,542	3,390	-4.3	270.1	13.1	12.6	SW
H	216	1,464	1,476	0.8	432.9	3.4	3.4	SW
H	217	6,376	6,098	-4.4	388.7	16.4	15.7	SW
H	218	4,053	3,983	-1.7	250.8	16.2	15.9	SW
H	219	1,404	1,373	-2.2	382.3	3.7	3.6	SW
H	220	1,600	1,845	15.3	719.1	2.2	2.6	SW
H	221	1,167	1,135	-2.7	161.9	7.2	7.0	SW
H	222	1,555	1,787	14.9	505.3	3.1	3.5	SW
Subtotal:		**42,525**	**41,547**	**-2.3**	**4,001.9**	**10.6**	**10.4**	
I	206	1,606	1,501	-6.5	317.8	5.1	4.7	SE/SW/NE
I	207	6,793	6,964	2.5	352.4	19.3	19.8	SE/SW
I	208	1,513	1,385	-8.5	221.7	6.8	6.2	SE/SW
I	223	374	361	-3.5	1,372.4	0.3	0.3	SE/SW
I	224	335	321	-4.2	160.4	2.1	2.0	SW
I	225	506	536	5.9	221.7	2.3	2.4	SW
I	226	472	452	-4.2	152.5	3.1	3.0	SW
I	227	1,423	1,514	6.4	141.6	10.0	10.7	SW
I	228	1,447	1,400	-3.2	174.2	8.3	8.0	SW
I	229	320	370	15.6	296.3	1.1	1.2	SE/SW
I	230	434	393	-9.4	308.4	1.4	1.3	SE
I	231	1,293	1,280	-1.0	210.0	6.2	6.1	SE
I	232	870	993	14.1	193.7	4.5	5.1	SE
I	233	3,243	3,076	-5.1	147.5	22.0	20.9	SE
I	234	574	552	-3.8	200.2	2.9	2.8	SE

I	235	1,182	1,101	-6.9	196.4	6.0	5.6	SE
I	236	2,636	2,511	-4.7	241.7	10.9	10.4	SE
I	237	5,349	5,141	-3.9	267.4	20.0	19.2	SE/NE
I	238	4,650	4,518	-2.8	195.0	23.8	23.2	SE/NE
I	239	1,702	1,608	-5.5	121.1	14.1	13.3	SE
I	240	4,193	4,293	2.4	153.0	27.4	28.1	SE/NE
I	241	1,495	1,575	5.4	101.3	14.8	15.5	SE/NE
I	242	4,312	4,093	-5.1	132.7	32.5	30.8	NE
I	243	4,294	4,228	-1.5	167.0	25.7	25.3	NE
I	244	3,671	3,456	-5.9	103.8	35.4	33.3	NE
I	245	4,527	4,591	1.4	199.4	22.7	23.0	NE
I	246	3,310	3,194	-3.5	153.2	21.6	20.8	NE
I	247	5,640	5,615	-0.4	231.8	24.3	24.2	NE
I	248	2,210	1,978	-10.5	80.6	27.4	24.5	NE
I	249	4,144	4,038	-2.6	80.3	51.6	50.3	NE
I	250	914	857	-6.2	184.1	5.0	4.7	NE
I	251	2,275	2,210	-2.9	132.2	17.2	16.7	NE
I	252	7,379	7,088	-3.9	233.5	31.6	30.4	NE
I	253	4,315	4,061	-5.9	141.3	30.5	28.7	NE
I	254	4,548	4,375	-3.8	191.0	23.8	22.9	NE
I	255	2,898	2,851	-1.6	191.8	15.1	14.9	SE/NE
I	256	2,971	3,008	1.2	214.7	13.8	14.0	SE/NE
I	257	3,448	3,409	-1.1	183.4	18.8	18.6	SE
Subtotal:		**103,266**	**100,897**	-2.3	**8,367.5**	**12.3**	**12.1**	
J	258	1,838	1,724	-6.2	144.3	12.7	11.9	SE/NE
J	259	5,511	5,391	-2.2	135.2	40.8	39.9	SE/NE
J	260	3,502	3,482	-0.6	133.9	26.2	26.0	NE
J	261	3,625	3,577	-1.3	164.3	22.1	21.8	NE
J	262	5,177	5,141	-0.7	137.1	37.8	37.5	NE
J	263	11,011	10,912	-0.9	272.8	40.4	40.0	NE
J	264	6,443	6,313	-2.0	196.9	32.7	32.1	NE
J	265	5,367	5,205	-3.0	136.4	39.3	38.2	NE

J	266	7,490	7,148	-4.6	222.4	33.7	32.1	NE
J	267	7,834	7,511	-4.1	158.9	49.3	47.3	NE
J	268	4,644	4,447	-4.2	189.5	24.5	23.5	NE
J	269	2,294	2,334	1.7	154.2	14.9	15.1	NE
J	270	2,275	2,203	-3.2	158.4	14.4	13.9	NE
J	271	2,455	2,642	7.6	93.2	26.3	28.3	NE
J	272	4,446	4,345	-2.3	162.8	27.3	26.7	NE
J	273	5,525	5,733	3.8	230.5	24.0	24.9	NE
J	274	9,620	10,189	5.9	207.6	46.3	49.1	NE
J	275	4,651	4,801	3.2	152.5	30.5	31.5	NE
J	276	4,250	4,220	-0.7	163.8	25.9	25.8	NE
J	277	5,358	5,106	-4.7	135.7	39.5	37.6	NE
J	278	5,262	4,908	-6.7	180.4	29.2	27.2	NE
J	279	7,901	7,564	-4.3	319.5	24.7	23.7	NE
J	280	5,219	5,157	-1.2	176.7	29.5	29.2	NE
J	281	4,377	4,321	-1.3	125.3	34.9	34.5	NE
J	282	6,016	5,915	-1.7	213.5	28.2	27.7	NE
J	283	8,746	8,262	-5.5	167.8	52.1	49.2	NE
J	284	5,865	5,435	-7.3	117.6	49.9	46.2	NE
J	285	2,259	2,355	4.2	70.7	32.0	33.3	NE
J	286	7,114	7,499	5.4	168.8	42.1	44.4	NE
J	287	2,468	2,606	5.6	87.5	28.2	29.8	NE
J	288	3,853	4,072	5.7	114.9	33.5	35.4	NE
J	289	8,484	8,335	-1.8	292.1	29.0	28.5	NE
J	290	5,670	5,905	4.1	198.7	28.5	29.7	NE
Subtotal:		**176,550**	**174,758**	**-1.0**	**5,583.9**	**31.6**	**31.3**	
K	291	4,461	4,647	4.2	334.8	13.3	13.9	NE
K	292	3,965	3,989	0.6	421.1	9.4	9.5	NE
K	293	2,878	2,833	-1.6	172.2	16.7	16.5	NE
K	294	3,216	3,183	-1.0	164.6	19.5	19.3	NE
K	295	1,067	1,070	0.3	156.9	6.8	6.8	NE
K	296	1,172	1,181	0.8	58.3	20.1	20.3	NE

K	297	454	461	1.5	176.2	2.6	2.6	NE
K	298	4,216	4,052	-3.9	160.4	26.3	25.3	NE
K	299	4,332	4,202	-3.0	147.8	29.3	28.4	NE
K	300	6,867	6,919	0.8	225.4	30.5	30.7	NE
K	301	5,603	5,696	1.7	180.4	31.1	31.6	NE
K	302	6,514	6,552	0.6	220.9	29.5	29.7	NE
K	303	6,947	6,617	-4.8	208.3	33.4	31.8	NE
K	304	631	715	13.3	307.4	2.1	2.3	NE
K	305	9,557	9,324	-2.4	264.2	36.2	35.3	NE
K	306	6,518	6,668	2.3	247.1	26.4	27.0	NE
K	307	2,929	2,938	0.3	158.6	18.5	18.5	NE
K	308	4,403	4,465	1.4	195.2	22.6	22.9	NE
K	309	3,278	3,320	1.3	158.9	20.6	20.9	NE
K	310	5,636	5,638	0.0	266.4	21.2	21.2	NE
K	311	7,940	7,839	-1.3	185.1	42.9	42.4	NE
K	312	3,857	3,841	-0.4	102.3	37.7	37.5	NE
K	313	5,396	5,320	-1.4	178.2	30.3	29.9	NE
K	314	9,575	9,396	-1.9	280.5	34.1	33.5	NE
K	315	9,379	9,175	-2.2	293.3	32.0	31.3	NE
K	316	5,530	5,338	-3.5	180.9	30.6	29.5	NE
K	317	5,581	5,327	-4.6	217.0	25.7	24.5	NE
K	318	3,456	3,427	-0.8	117.9	29.3	29.1	NE
K	319	4,810	4,758	-1.1	188.8	25.5	25.2	NE
K	320	6,449	6,209	-3.7	171.0	37.7	36.3	NE
K	321	3,906	3,862	-1.1	136.4	28.6	28.3	NE
K	322	179	159	-11.2	138.4	1.3	1.1	NE
K	323	3,596	3,499	-2.7	150.2	23.9	23.3	NE
K	324	15	16	6.7	168.3	0.1	0.1	NE
K	325	5,747	5,673	-1.3	207.8	27.7	27.3	NE
K	326	6,733	6,571	-2.4	199.9	33.7	32.9	NE
K	327	307	268	-12.7	340.8	0.9	0.8	NE
K	329	4,216	4,178	-0.9	233.0	18.1	17.9	NE
K	330	7,408	7,137	-3.7	184.1	40.2	38.8	NE
K	331	9,099	9,077	-0.2	294.3	30.9	30.8	NE

K	332	2,594	2,505	-3.4	207.1	12.5	12.1	NE
K	333	4,025	4,024	0.0	257.2	15.6	15.6	NE
K	334	4,456	4,291	-3.7	291.1	15.3	14.7	NE
K	335	3,400	3,394	-0.2	226.6	15.0	15.0	NE
K	336	6,148	5,903	-4.0	279.5	22.0	21.1	NE
K	337	9,025	8,808	-2.4	504.3	17.9	17.5	NE
K	338	5,461	5,426	-0.6	344.5	15.9	15.8	NE
K	339	2,862	2,837	-0.9	281.7	10.2	10.1	NE
K	340	2,518	2,388	-5.2	187.1	13.5	12.8	NE
K	341	5,567	5,522	-0.8	333.8	16.7	16.5	NE
K	342	3,369	3,529	4.7	245.1	13.7	14.4	NE
K	367 $	3	3	0.0	~~N/A~~ 1.2	N/A	N/A	NE
Subtotal:		**237,251**	**234,170**	**-1.3**	**11,351.3**	**20.9**	**20.6**	
L	328	5,371	5,026	-6.4	662.2	8.1	7.6	NE
L	343	168	168	0.0	1,336.3	0.1	0.1	NE
L	344	7,792	7,378	-5.3	852.0	9.1	8.7	NE
L	345	7,947	9,333	17.4	355.6	22.3	26.2	NE
L	346	1,397	1,380	-1.2	453.7	3.1	3.0	NE
L	347	10,557	9,980	-5.5	530.8	19.9	18.8	NE
L	348	14,902	14,541	-2.4	967.7	15.4	15.0	NE
L	349	7,002	6,781	-3.2	483.3	14.5	14.0	NE
L	351	3,808	4,515	18.6	243.6	15.6	18.5	NE
L	352	4,580	4,481	-2.2	461.8	9.9	9.7	NE
L	353	10,742	10,412	-3.1	757.1	14.2	13.8	NE
L	354	31	31	0.0	1,889.9	0.0	0.0	NE
L	355	6,953	6,402	-7.9	576.0	12.1	11.1	NE
L	356	8,376	8,874	5.9	850.0	9.9	10.4	NE
L	357	8,670	8,740	0.8	530.3	16.3	16.5	NE
L	358	6,113	5,664	-7.3	434.7	14.1	13.0	NE
L	359	5,454	6,241	14.4	558.5	9.8	11.2	NE
L	360	3,061	3,219	5.2	575.3	5.3	5.6	NE
L	361	4,046	3,742	-7.5	300.0	13.5	12.5	NE

L	362	17,971	17,385	-3.3	904.6	19.9	19.2	NE
L	363	15,723	14,767	-6.1	1,336.8	11.8	11.0	NE
L	364	547	522	-4.6	1,072.7	0.5	0.5	NE
L	365	9,336	10,576	13.3	888.3	10.5	11.9	NE
Subtotal:		**160,547**	**160,158**	**-0.2**	**17,021.2**	**9.4**	**9.4**	
Total:		**1,585,577**	**1,551,188**	**-2.2**	**86,482.3**	**18.3**	**17.9**	

* Population living on boats, adjacent to tract
$ One house, minimal acerage

Projections obtained from National Planning Data Corporation (1991)

City of Philadelphia 1980-1990
Census Data Comparison

Population

Planning Analysis Section	Tract No.	1980 Total Population	1990 Total Population	Percent Change 80 - 90	Tract Area Acres	1980 People per Acre	1990 People per acre	WWTP Service Area
E	164 (5%)	307	279	-9.1	5.9	51.9	47.1	NE
F	171 (5%)	304	264	-13.2	14.1	21.5	18.7	NE
F	173	3,993	3,815	-4.5	217.0	18.4	17.6	NE
F	174	3,780	3,406	-9.9	86.0	44.0	39.6	NE
F	175 (45%)	4,348	4,055	-6.7	79.5	54.7	51.0	NE
F	194	281	361	28.5	332.6	0.8	1.1	NE
F	195 (60%)	5,039	5,224	3.7	116.2	43.4	45.0	NE
F	196	2,390	2,639	10.4	185.3	12.9	14.2	NE
F	197	7,213	7,736	7.3	210.8	34.2	36.7	NE
F	198	7,486	6,966	-6.9	133.4	56.1	52.2	NE
F	199	5,827	5,390	-7.5	164.6	35.4	32.7	NE
F	200	2,536	2,176	-14.2	79.6	31.9	27.3	NE
F	201	9,799	8,049	-17.9	215.7	45.4	37.3	NE
F	202(70%)	5,151	4,271	-17.1	132.2	39.0	32.3	NE
F	203	4,752	3,780	-20.5	130.0	36.6	29.1	NE
F	204	4,217	3,805	-9.8	101.8	41.4	37.4	NE
F	205 (85%)	2,790	2,941	5.4	301.0	9.3	9.8	NE
G	177 (20%)	1,824	1,719	-5.8	35.3	51.7	48.7	NE
G	178 (75%)	5,161	4,689	-9.1	125.6	41.1	37.3	NE
G	179	6,895	6,435	-6.7	167.8	41.1	38.3	NE
G	180	8,699	8,419	-3.2	201.1	43.3	41.9	NE
G	181	191	197	3.1	170.7	1.1	1.2	NE
G	182	382	375	-1.8	581.7	0.7	0.6	NE
G	182.99*	43	0	-100.0	N/A	N/A	N/A	NE

G	183	4,501	4,225	-6.1	520.6	8.6	8.1	NE
G	184	2,328	2,306	-0.9	282.4	8.2	8.2	NE
G	185	147	134	-8.8	163.6	0.9	0.8	NE
G	186	5,163	4,821	-6.6	176.2	29.3	27.4	NE
G	187	1,834	1,773	-3.3	198.9	9.2	8.9	NE
G	188	7,432	7,167	-3.6	166.3	44.7	43.1	NE
G	189	1,077	1,013	-5.9	252.5	4.3	4.0	NE
G	190	6,761	6,428	-4.9	196.9	34.3	32.6	NE
G	191	6,748	6,060	-10.2	359.5	18.8	16.9	NE
G	192	7,364	7,078	-3.9	162.8	45.2	43.5	NE
G	193	131	134	2.3	280.7	0.5	0.5	NE
I	206 (10%)	184	161	-12.5	31.8	5.8	5.1	NE
I	237 (40%)	2,206	2,140	-3.0	107.0	20.6	20.0	NE
I	238 (25%)	1,235	1,163	-5.8	48.8	25.3	23.8	NE
I	240 (30%)	1,223	1,258	2.9	45.9	26.6	27.4	NE
I	241 (75%)	1,097	1,121	2.2	76.0	14.4	14.8	NE
I	242	4,807	4,312	-10.3	132.7	36.2	32.5	NE
I	243	4,511	4,294	-4.8	167.0	27.0	25.7	NE
I	244	4,200	3,671	-12.6	103.8	40.5	35.4	NE
I	245	4,598	4,527	-1.5	199.4	23.1	22.7	NE
I	246	3,633	3,310	-8.9	153.2	23.7	21.6	NE
I	247	5,823	5,640	-3.1	231.8	25.1	24.3	NE
I	248	2,719	2,210	-18.7	80.6	33.7	27.4	NE
I	249	4,446	4,144	0.0	80.3	55.4	51.6	NE
I	250	909	914	0.6	184.1	4.9	5.0	NE
I	251	2,448	2,275	-7.1	132.2	18.5	17.2	NE
I	252	8,268	7,379	-10.8	233.5	35.4	31.6	NE
I	253	4,911	4,315	-12.1	141.3	34.8	30.5	NE
I	254	4,977	4,548	-8.6	191.0	26.1	23.8	NE
I	255 (95%)	2,914	2,753	-5.5	182.2	16.0	15.1	NE
I	256 (20%)	614	594	-3.3	42.9	14.3	13.8	NE
J	258 (55%)	1,158	1,011	-12.7	79.4	14.6	12.7	NE
J	259 (65%)	3,810	3,582	-6.0	87.9	43.3	40.8	NE
J	260	3,625	3,502	-3.4	133.9	27.1	26.2	NE

J	261	3,798	3,625	-4.6	164.3	23.1	22.1	NE
J	262	5,371	5,177	-3.6	137.1	39.2	37.8	NE
J	263	11,474	11,011	-4.0	272.8	42.1	40.4	NE
J	264	6,841	6,443	-5.8	196.9	34.7	32.7	NE
J	265	5,798	5,367	-7.4	136.4	42.5	39.3	NE
J	266	8,328	7,490	-10.1	222.4	37.4	33.7	NE
J	267	8,650	7,834	100.0	158.9	54.4	49.3	NE
J	268	4,933	4,644	-5.9	189.5	26.0	24.5	NE
J	269	2,023	2,294	13.4	154.2	13.1	14.9	NE
J	270	2,474	2,275	-8.0	158.4	15.6	14.4	NE
J	271	2,206	2,455	11.3	93.2	23.7	26.3	NE
J	272	4,739	4,446	-6.2	162.8	29.1	27.3	NE
J	273	5,316	5,525	3.9	230.5	23.1	24.0	NE
J	274	8,911	9,620	8.0	207.6	42.9	46.3	NE
J	275	4,516	4,651	3.0	152.5	29.6	30.5	NE
J	276	4,595	4,250	-7.5	163.8	28.1	25.9	NE
J	277	5,984	5,358	-10.5	135.7	44.1	39.5	NE
J	278	6,005	5,262	-12.4	180.4	33.3	29.2	NE
J	279	8,549	7,901	-7.6	319.5	26.8	24.7	NE
J	280	5,463	5,219	-4.5	176.7	30.9	29.5	NE
J	281	4,581	4,377	-4.5	125.3	36.6	34.9	NE
J	282	6,034	6,016	-0.3	213.5	28.3	28.2	NE
J	283	9,895	8,746	-11.6	167.8	59.0	52.1	NE
J	284	6,881	5,865	-14.8	117.6	58.5	49.9	NE
J	285	2,157	2,259	4.7	70.7	30.5	32.0	NE
J	286	6,630	7,114	7.3	168.8	39.3	42.1	NE
J	287	2,299	2,468	7.4	87.5	26.3	28.2	NE
J	288	3,595	3,853	7.2	114.9	31.3	33.5	NE
J	289	8,963	8,484	-5.3	292.1	30.7	29.0	NE
J	290	5,437	5,670	4.3	198.7	27.4	28.5	NE
K	291	4,263	4,461	4.6	334.8	12.7	13.3	NE
K	292	4,015	3,965	-1.2	421.1	9.5	9.4	NE
K	293	3,039	2,878	-5.3	172.2	17.6	16.7	NE
K	294	3,352	3,216	-4.1	164.6	20.4	19.5	NE

K	295	1,088	1,067	-1.9	156.9	6.9	6.8	NE
K	296	1,186	1,172	-1.2	58.3	20.3	20.1	NE
K	297	483	454	-6.0	176.2	2.7	2.6	NE
K	298	4,609	4,216	-8.5	160.4	28.7	26.3	NE
K	299	4,698	4,332	-7.8	147.8	31.8	29.3	NE
K	300	6,937	6,867	-1.0	225.4	30.8	30.5	NE
K	301	5,544	5,603	1.1	180.4	30.7	31.1	NE
K	302	6,616	6,514	-1.5	220.9	30.0	29.5	NE
K	303	7,715	6,947	-10.0	208.3	37.0	33.4	NE
K	304	508	631	24.2	307.4	1.7	2.1	NE
K	305	10,220	9,557	-6.5	264.2	38.7	36.2	NE
K	306	6,526	6,518	-0.1	247.1	26.4	26.4	NE
K	307	2,943	2,929	-0.5	158.6	18.6	18.5	NE
K	308	4,410	4,403	-0.2	195.2	22.6	22.6	NE
K	309	3,286	3,278	-0.2	158.9	20.7	20.6	NE
K	310	5,774	5,636	-2.4	266.4	21.7	21.2	NE
K	311	8,316	7,940	-4.5	185.1	44.9	42.9	NE
K	312	3,982	3,857	-3.1	102.3	38.9	37.7	NE
K	313	5,681	5,396	-5.0	178.2	31.9	30.3	NE
K	314	10,137	9,575	-5.5	280.5	36.1	34.1	NE
K	315	9,986	9,379	-6.1	293.3	34.0	32.0	NE
K	316	6,023	5,530	-8.2	180.9	33.3	30.6	NE
K	317	6,196	5,581	-9.9	217.0	28.6	25.7	NE
K	318	3,591	3,456	-3.8	117.9	30.5	29.3	NE
K	319	5,023	4,810	-4.2	188.8	26.6	25.5	NE
K	320	7,056	6,449	-8.6	171.0	41.3	37.7	NE
K	321	4,081	3,906	-4.3	136.4	29.9	28.6	NE
K	322	225	179	-20.4	138.4	1.6	1.3	NE
K	323	3,860	3,596	-6.8	150.2	25.7	23.9	NE
K	324	14	15	7.1	168.3	0.1	0.1	NE
K	325	6,011	5,747	-4.4	207.8	28.9	27.7	NE
K	326	7,195	6,733	-6.4	199.9	36.0	33.7	NE
K	327	284	307	8.1	340.8	0.8	0.9	NE
K	329	4,385	4,216	-3.9	233.0	18.8	18.1	NE

K	330	8,122	7,408	-8.8	184.1	44.1	40.2	NE
K	331	9,370	9,099	-2.9	294.3	31.8	30.9	NE
K	332	2,824	2,594	-8.1	207.1	13.6	12.5	NE
K	333	3,842	4,025	4.8	257.2	14.9	15.6	NE
K	334	4,812	4,456	-7.4	291.1	16.5	15.3	NE
K	335	3,481	3,400	-2.3	226.6	15.4	15.0	NE
K	336	6,751	6,148	-8.9	279.5	24.2	22.0	NE
K	337	9,671	9,025	-6.7	504.3	19.2	17.9	NE
K	338	5,655	5,461	-3.4	344.5	16.4	15.9	NE
K	339	3,044	2,862	-6.0	281.7	10.8	10.2	NE
K	340	2,820	2,518	-10.7	187.1	15.1	13.5	NE
K	341	5,775	5,567	-3.6	333.8	17.3	16.7	NE
K	342	3,134	3,369	7.5	245.1	12.8	13.7	NE
K	367	0	3	100.0	1.2	N/A	N/A	NE
L	328	2,671	5,371	101.1	662.2	4.0	8.1	NE
L	343	171	168	-1.8	1,336.3	0.1	0.1	NE
L	344	8,641	7,792	-9.8	852.0	10.1	9.1	NE
L	345	5,852	7,947	35.8	355.6	16.5	22.3	NE
L	346	1,456	1,397	-4.1	453.7	3.2	3.1	NE
L	347	11,864	10,557	-11.0	530.8	22.4	19.9	NE
L	348	15,947	14,902	-6.6	967.7	16.5	15.4	NE
L	349	7,583	7,002	-7.7	483.3	15.7	14.5	NE
L	351	2,650	3,808	43.7	243.6	10.9	15.6	NE
L	352	4,896	4,580	-6.5	461.8	10.6	9.9	NE
L	353	11,617	10,742	-7.5	757.1	15.3	14.2	NE
L	354	5	31	520.0	1,889.9	0.0	0.0	NE
L	355	8,243	6,953	-15.6	576.0	14.3	12.1	NE
L	356	7,691	8,376	8.9	850.0	9.0	9.9	NE
L	357	8,763	8,670	-1.1	530.3	16.5	16.3	NE
L	358	7,172	6,113	-14.8	434.7	16.5	14.1	NE
L	359	4,298	5,454	26.9	558.5	7.7	9.8	NE
L	360	2,787	3,061	9.8	575.3	4.8	5.3	NE
L	361	4,764	4,046	-15.1	300.0	15.9	13.5	NE
L	362	19,565	17,971	-8.1	904.6	21.6	19.9	NE

L	363	17,998	15,723	-12.6	1,336.8	13.5	11.8	NE
L	364	1,261	547	-56.6	1,072.7	1.2	0.5	NE
L	365	7,476	9,336	24.9	888.3	8.4	10.5	NE
Subtotal:		**795,586**	**760,451**	**-4.4**	**42,959.3**	**18.5**	**17.7**	
A	1	656	2,073	216.0	175.2	3.7	11.8	SE
A	2	1,150	1,403	22.0	100.6	11.4	13.9	SE
A	4 (35%)	1,587	1,122	-29.3	45.2	35.1	24.8	SE
A	5	461	1,055	128.9	106.5	4.3	9.9	SE
A	6	279	349	25.1	42.3	6.6	8.3	SE
A	7 (50%)	1,224	1,535	25.4	31.0	39.5	49.5	SE
A	8 (50%)	4,055	3,819	-5.8	49.6	81.8	77.0	SE
A	9	4,230	4,234	0.1	64.7	65.4	65.4	SE
A	10	5,213	5,715	9.6	174.2	29.9	32.8	SE
A	11	5,993	5,594	-6.7	91.9	65.2	60.9	SE
A	12 (45%)	3,744	3,803	1.6	71.4	52.4	53.3	SE
A	366	0	400	100.0	250.8	0.0	1.6	SE
A	366.99 *	0	31	100.0	N/A	N/A	N/A	SE
B	14 (30%)	1,041	1,129	8.5	23.8	43.7	47.4	SE
B	15	2,512	2,537	1.0	58.6	42.9	43.3	SE
B	16	1,837	1,943	5.8	49.4	37.2	39.3	SE
B	17	2,149	2,493	16.0	50.7	42.4	49.2	SE
B	18	3,625	3,247	-10.4	59.3	61.1	54.8	SE
B	19 (35%)	1,326	847	-36.1	28.5	46.5	29.7	SE
B	21 (80%)	2,251	2,109	-6.3	47.0	47.9	44.9	SE
B	22 (90%)	2,036	1,976	-2.9	53.2	38.3	37.1	SE
B	23	2,908	2,529	-13.0	52.6	55.3	48.1	SE
B	24	4,760	4,311	-9.4	132.0	36.1	32.7	SE
B	25	4,960	3,435	-30.7	98.6	50.3	34.8	SE
B	26	0	0	0.0	113.7	0.0	0.0	SE
B	27	8,576	7,365	-14.1	146.5	58.5	50.3	SE
B	28	9,632	8,968	-6.9	146.0	66.0	61.4	SE
B	29	5,163	4,017	-22.2	89.7	57.6	44.8	SE

B	30 (40%)	3,236	3,346	3.4	47.0	68.9	71.2	SE
B	39 (5%)	679	593	-12.7	11.1	61.2	53.4	SE
B	40	11,188	9,447	-15.6	160.1	69.9	59.0	SE
B	41	14,936	13,326	-10.8	191.8	77.9	69.5	SE
B	42	11,763	11,081	-5.8	198.4	59.3	55.9	SE
B	43	0	46	100.0	466.5	0.0	0.1	SE
B	43.99*	58	0	-100.0	N/A	N/A	N/A	SE
B	44	1,253	1,078	-14.0	142.6	8.8	7.6	SE
B	45	3,609	3,255	-9.8	123.3	29.3	26.4	SE
B	48	584	526	-9.9	112.2	5.2	4.7	SE
B	49	2	0	-100.0	1,092.9	0.0	0.0	SE
B	50 (60%)	1,811	1,337	-26.2	666.0	2.7	2.0	SE
B	50.99(60%)*	511	1,372	168.5	N/A	N/A	N/A	SE
E	125 (40%)	1,357	1,445	6.5	82.9	16.4	17.4	SE
E	126	409	635	55.3	90.7	4.5	7.0	SE
E	127	378	399	5.6	83.3	4.5	4.8	SE
E	128	71	163	129.6	63.5	1.1	2.6	SE
E	129	288	430	49.3	89.5	3.2	4.8	SE
E	130	878	1,009	14.9	51.4	17.1	19.6	SE
E	131	2,772	2,200	-20.6	79.1	35.0	27.8	SE
E	132	4,722	4,166	-11.8	107.0	44.1	38.9	SE
E	133	2,676	2,264	-15.4	88.7	30.2	25.5	SE
E	134 (50%)	2,847	2,701	-5.1	52.9	53.8	51.1	SE
E	135 (95%)	3,346	3,540	5.8	95.3	35.1	37.1	SE
E	136 (10%)	653	588	-10.0	10.0	65.3	58.8	SE
E	137(50%)	3,610	3,287	-8.9	75.0	48.1	43.8	SE
E	138 (90%)	3,355	2,647	-21.1	78.3	42.8	33.8	SE
E	139	5,404	4,785	-11.5	140.1	38.6	34.2	SE
E	140	4,622	3,594	-22.2	105.5	43.8	34.1	SE
E	141	3,536	2,768	-21.7	141.3	25.0	19.6	SE
E	142	2,232	2,190	-1.9	196.2	11.4	11.2	SE
E	144	3,362	3,331	-0.9	154.2	21.8	21.6	SE
E	145	2,764	2,006	-27.4	80.1	34.5	25.0	SE
E	146	3,086	3,322	7.6	112.7	27.4	29.5	SE

E	147	3,540	2,437	-31.2	85.5	41.4	28.5	SE
E	148	1,738	1,278	-26.5	47.2	36.8	27.1	SE
E	149	6,853	5,834	-14.9	110.0	62.3	53.0	SE
E	151 (75%)	8,059	6,911	-14.2	140.3	57.4	49.3	SE
E	152	11,241	8,134	-27.6	161.9	69.4	50.2	SE
E	153	5,308	3,621	-31.8	113.7	46.7	31.8	SE
E	154	2,150	1,819	-15.4	76.8	28.0	23.7	SE
E	155	4,565	3,413	-25.2	104.0	43.9	32.8	SE
E	156	2,857	2,386	-16.5	106.0	27.0	22.5	SE
E	157	2,628	2,764	5.2	122.3	21.5	22.6	SE
E	162	3,537	2,858	-19.2	86.2	41.0	33.2	SE
E	163	4,229	4,147	-1.9	139.6	30.3	29.7	SE
E	164 (95%)	5,834	5,310	-9.0	112.5	51.9	47.2	SE
E	165	5,095	3,870	-24.0	99.1	51.4	39.1	SE
E	166	1,788	1,475	-17.5	63.3	28.2	23.3	SE
E	167	10,391	8,509	-18.1	151.2	68.7	56.3	SE
E	168	5,903	5,370	-9.0	142.8	41.3	37.6	SE
E	169 (40%)	5,842	4,911	-15.9	106.6	54.8	46.1	SE
F	170 (45%)	2,039	1,767	-13.3	176.6	11.5	10.0	SE
F	171 (20%)	1,215	1,055	-13.2	56.6	21.5	18.6	SE
F	172 (30%)	3,395	2,993	-11.8	41.5	81.8	72.1	SE
F	175 (55%)	5,315	4,955	-6.8	97.2	54.7	51.0	SE
F	176	10,791	11,464	6.2	243.6	44.3	47.1	SE
F	195 (40%)	3,360	3,483	3.7	77.5	43.4	44.9	SE
F	202 (20%)	1,472	1,220	-17.1	37.8	38.9	32.3	SE
F	205 (15%)	493	519	5.3	53.1	9.3	9.8	SE
G	143	1,488	1,470	-1.2	136.9	10.9	10.7	SE
G	158	6,786	6,059	-10.7	147.0	46.2	41.2	SE
G	159	1,926	1,765	-8.4	171.5	11.2	10.3	SE
G	160	8,420	7,973	-5.3	176.4	47.7	45.2	SE
G	161	6,546	6,034	-7.8	172.0	38.1	35.1	SE
G	177 (80%)	7,298	6,878	-5.8	141.1	51.7	48.7	SE
G	178 (25%)	1,720	1,563	-9.1	41.9	41.1	37.3	SE
I	206 (70%)	1,289	1,124	-12.8	222.5	5.8	5.1	SE

I	207 (10%)	664	679	2.3	35.2	18.9	19.3	SE
I	208 (40%)	838	605	-27.8	88.7	9.4	6.8	SE
I	223 (55%)	37	206	456.8	754.8	0.0	0.3	SE
I	228 (10%)	157	145	-7.6	17.4	9.0	8.3	SE
I	229 (90%)	222	288	29.7	266.7	0.8	1.1	SE
I	230	384	434	13.0	308.4	1.2	1.4	SE
I	231	1,347	1,293	-4.0	210.0	6.4	6.2	SE
I	232	690	870	26.1	193.7	3.6	4.5	SE
I	233	3,644	3,243	-11.0	147.5	24.7	22.0	SE
I	234	631	574	-9.0	200.2	3.2	2.9	SE
I	235	1,367	1,182	-13.5	196.4	7.0	6.0	SE
I	236	3,016	2,636	-12.6	241.7	12.5	10.9	SE
I	237 (60%)	3,310	3,209	-3.1	160.4	20.6	20.0	SE
I	238 (75%)	3,706	3,487	-5.9	146.2	25.3	23.9	SE
I	239	1,913	1,702	-11.0	121.1	15.8	14.1	SE
I	240 (70%)	2,852	2,935	2.9	107.1	26.6	27.4	SE
I	241 (25%)	366	374	2.2	25.3	14.5	14.8	SE
I	255 (5%)	153	145	-5.2	9.6	15.9	15.1	SE
I	256 (80%)	2,457	2,377	-3.3	171.8	14.3	13.8	SE
I	257	3,691	3,448	-6.6	183.4	20.1	18.8	SE
J	258 (45%)	948	827	-12.8	64.9	14.6	12.7	SE
J	259 (35%)	2,052	1,929	-6.0	47.3	43.4	40.8	SE
Subtotal:		**372,922**	**338,873**	**-9.1**	**15,202.6**	**24.5**	**22.3**	
A	3	2,160	2,427	12.4	139.1	15.5	17.4	SW
A	4 (65%)	2,946	2,084	-29.3	84.0	35.1	24.8	SW
A	7 (50%)	1,224	1,534	25.3	31.0	39.5	49.5	SW
A	8 (50%)	4,055	3,818	-5.8	49.5	81.9	77.1	SW
A	12 (55%)	4,575	4,649	1.6	87.2	52.5	53.3	SW
B	13	5,152	4,520	-12.3	177.7	29.0	25.4	SW
B	14 (70%)	2,428	2,634	8.5	55.5	43.7	47.5	SW
B	19 (65%)	2,462	1,572	-36.1	53.0	46.5	29.7	SW
B	20	2,681	2,516	-6.2	71.9	37.3	35.0	SW

B	21 (20%)	563	527	-6.4	11.8	47.7	44.7	SW
B	22 (10%)	226	219	-3.1	5.9	38.3	37.1	SW
B	30 (60%)	4,854	5,018	3.4	70.6	68.8	71.1	SW
B	31	6,422	5,902	-8.1	97.6	65.8	60.5	SW
B	32	6,926	6,147	-11.2	122.3	56.6	50.3	SW
B	33	7,271	6,128	-15.7	185.6	39.2	33.0	SW
B	34	557	466	-16.3	146.5	3.8	3.2	SW
B	35	123	95	-22.8	406.7	0.3	0.2	SW
B	36	7,813	7,429	-4.9	220.4	35.4	33.7	SW
B	37	11,021	10,373	-5.9	151.7	72.6	68.4	SW
B	38.99	4,640	4,092	-11.8	171.7	27.0	23.8	SW
B	39 (95%)	12,897	11,260	-12.7	211.0	61.1	53.4	SW
B	46	3,072	2,391	-22.2	923.4	3.3	2.6	SW
B	47.98	4,663	4,370	-6.3	205.6	22.7	21.3	SW
B	50 (40%)	1,208	892	-26.2	444.0	2.7	2.0	SW
B	50.99(40%)*	341	915	168.3	N/A	N/A	N/A	SW
B	51	592	1,165	96.8	596.3	1.0	2.0	SW
C	52	31	53	71.0	2,140.7	0.0	0.0	SW
C	54	935	1,271	35.9	436.6	2.1	2.9	SW
C	55	6,274	6,293	0.3	296.5	21.2	21.2	SW
C	56	1,259	1,217	-3.3	207.6	6.1	5.9	SW
C	57	81	3	-96.3	318.5	0.3	0.0	SW
C	58	0	32	100.0	838.9	0.0	0.0	SW
C	59	0	0	0.0	96.4	0.0	0.0	SW
C	60	6,848	6,554	-4.3	268.6	25.5	24.4	SW
C	61	3,548	3,146	-11.3	132.0	26.9	23.8	SW
C	62	4,292	4,038	-5.9	124.8	34.4	32.4	SW
C	63	4,468	4,709	5.4	137.1	32.6	34.3	SW
C	64	4,861	4,512	-7.2	163.8	29.7	27.5	SW
C	65	6,716	6,283	-6.4	286.4	23.4	21.9	SW
C	66	4,253	4,218	-0.8	162.1	26.2	26.0	SW
C	67	7,118	6,431	-9.7	248.3	28.7	25.9	SW
C	68	0	0	0.0	225.4	0.0	0.0	SW
C	69	2,974	2,520	-15.3	150.2	19.8	16.8	SW

C	70	5,633	5,374	-4.6	115.9	48.6	46.4	SW
C	71	10,371	9,952	-4.0	165.6	62.6	60.1	SW
C	72	6,476	6,112	-5.6	120.8	53.6	50.6	SW
C	73	4,227	3,722	-11.9	96.6	43.8	38.5	SW
C	74	5,963	5,445	-8.7	167.0	35.7	32.6	SW
C	75	0	0	0.0	123.1	0.0	0.0	SW
D	76	1,774	416	-76.6	248.3	7.1	1.7	SW
D	77	1,898	2,253	18.7	80.3	23.6	28.1	SW
D	78	5,319	4,776	-10.2	107.2	49.6	44.6	SW
D	79	5,147	4,729	-8.1	93.2	55.2	50.7	SW
D	80	5,508	5,031	-8.7	105.8	52.1	47.6	SW
D	81	10,325	9,314	-9.8	152.0	67.9	61.3	SW
D	82	9,140	8,020	-12.3	206.1	44.3	38.9	SW
D	83	11,136	10,336	-7.2	232.8	47.8	44.4	SW
D	84	5,624	5,286	-6.0	122.8	45.8	43.0	SW
D	85	8,170	7,761	-5.0	154.2	53.0	50.3	SW
D	86	6,559	6,685	1.9	154.9	42.3	43.2	SW
D	87	7,210	7,249	0.5	133.2	54.1	54.4	SW
D	88	8,440	9,190	8.9	140.6	60.0	65.4	SW
D	89	2,246	2,786	24.0	216.0	10.4	12.9	SW
D	90	3,805	4,473	17.6	110.2	34.5	40.6	SW
D	91	2,722	2,968	9.0	103.5	26.3	28.7	SW
D	92	3,440	3,197	-7.1	127.3	27.0	25.1	SW
D	93	5,286	4,922	-6.9	99.6	53.1	49.4	SW
D	94	4,235	4,226	-0.2	92.2	45.9	45.8	SW
D	95	4,214	3,877	-8.0	80.1	52.6	48.4	SW
D	96	5,230	4,915	-6.0	101.3	51.6	48.5	SW
D	97	42	89	111.9	527.1	0.1	0.2	SW
D	98	7,677	7,271	-5.3	223.4	34.4	32.5	SW
D	99	380	366	-3.7	50.9	7.5	7.2	SW
D	100	4,455	3,882	-12.9	136.6	32.6	28.4	SW
D	101	6,867	6,389	-7.0	149.0	46.1	42.9	SW
D	102	3,256	3,231	-0.8	88.5	36.8	36.5	SW
D	103	3,168	2,933	-7.4	71.2	44.5	41.2	SW

D	104	4,421	4,251	-3.8	116.6	37.9	36.5	SW
D	105	5,297	4,535	-14.4	165.1	32.1	27.5	SW
D	106	2,132	1,622	-23.9	64.0	33.3	25.3	SW
D	107	4,718	4,166	-11.7	114.4	41.2	36.4	SW
D	108	5,969	4,727	-20.8	132.7	45.0	35.6	SW
D	109	3,143	2,503	-20.4	63.8	49.3	39.2	SW
D	110	4,767	4,591	-3.7	119.8	39.8	38.3	SW
D	111	5,727	5,333	-6.9	325.9	17.6	16.4	SW
D	112	6,672	6,547	-1.9	125.0	53.4	52.4	SW
D	113	3,802	3,545	-6.8	85.3	44.6	41.6	SW
D	114	7,537	7,232	-4.0	240.7	31.3	30.0	SW
D	115	4,364	3,776	-13.5	88.5	49.3	42.7	SW
D	116	3,433	2,997	-12.7	185.1	18.5	16.2	SW
D	117	1,942	2,088	7.5	164.1	11.8	12.7	SW
D	118	7,529	7,059	-6.2	232.3	32.4	30.4	SW
D	119	6,183	6,302	1.9	172.5	35.8	36.5	SW
D	120	1,747	1,781	1.9	148.0	11.8	12.0	SW
D	121	2,989	3,007	0.6	221.2	13.5	13.6	SW
D	122	7,249	6,955	-4.1	353.4	20.5	19.7	SW
D	123	85	117	37.6	1,362.5	0.1	0.1	SW
D	124	0	8	100.0	298.7	0.0	0.0	SW
E	125 (60%)	2,035	2,167	6.5	124.4	16.4	17.4	SW
E	134 (50%)	2,847	2,700	-5.2	52.9	53.8	51.0	SW
E	135 (5%)	176	186	5.7	5.0	35.2	37.2	SW
E	136 (90%)	5,879	5,294	-10.0	89.8	65.5	59.0	SW
E	137 (50%)	3,610	3,286	-9.0	75.0	48.1	43.8	SW
E	138 (10%)	373	294	-21.2	8.7	42.9	33.8	SW
E	150	10	97	870.0	588.8	0.0	0.2	SW
E	151 (25%)	2,686	2,304	-14.2	46.8	57.4	49.2	SW
E	169 (60%)	8,762	7,367	-15.9	160.0	54.8	46.0	SW
F	170 (55%)	2,493	2,160	-13.4	215.8	11.6	10.0	SW
F	171 (75%)	4,557	3,957	-13.2	212.3	21.5	18.6	SW
F	172 (70%)	7,921	6,983	-11.8	96.9	81.7	72.1	SW
F	202 (10%)	736	611	-17.0	18.8	39.1	32.5	SW

H	209	3,473	3,080	-11.3	131.5	26.4	23.4	SW
H	210	5,770	5,505	-4.6	210.5	27.4	26.2	SW
H	211	2,981	2,608	-12.5	134.9	22.1	19.3	SW
H	212	2,702	2,474	-8.4	122.3	22.1	20.2	SW
H	213	4,148	3,830	-7.7	134.4	30.9	28.5	SW
H	214	4,417	3,867	-12.5	157.2	28.1	24.6	SW
H	215	3,924	3,542	-9.7	270.1	14.5	13.1	SW
H	216	1,479	1,464	-1.0	432.9	3.4	3.4	SW
H	217	7,158	6,376	-10.9	388.7	18.4	16.4	SW
H	218	4,267	4,053	-5.0	250.8	17.0	16.2	SW
H	219	1,494	1,404	-6.0	382.3	3.9	3.7	SW
H	220	1,147	1,600	39.5	719.1	1.6	2.2	SW
H	221	1,265	1,167	-7.7	161.9	7.8	7.2	SW
H	222	1,215	1,555	28.0	505.3	2.4	3.1	SW
I	206 (20%)	369	321	-13.0	63.5	5.8	5.1	SW
I	207 (90%)	5,974	6,114	2.3	317.2	18.8	19.3	SW
I	208 (60%)	1,257	908	-27.8	133.0	9.5	6.8	SW
I	223 (45%)	31	168	441.9	617.6	0.1	0.3	SW
I	224	375	335	-10.7	160.4	2.3	2.1	SW
I	225	765	506	-33.9	221.7	3.5	2.3	SW
I	226	479	472	-1.5	152.5	3.1	3.1	SW
I	227	1,307	1,423	8.9	141.6	9.2	10.0	SW
I	228 (90%)	1,416	1,302	-8.1	156.8	9.0	8.3	SW
I	229 (10%)	25	32	28.0	29.6	0.8	1.1	SW
Subtotal:		**519,702**	**486,253**	**-6.4**	**28,321.8**	**18.3**	**17.2**	
Total:		**1,688,210**	**1,585,577**	**-6.1**	**86,483.7**	**19.5**	**18.3**	

* Population living on boats, adjacent to tract.
$ One house, minimal acerage

City of Philadelphia 1990-1996
Census Data Comparison

cenpl90.xls

Population

Planning Analysis Section	Tract No.	1990 Total Population	1996 Projected Population	Percent Change 90 - 96	Tract Area Acres	1990 People per Acre	1996 People per acre	WWTP Service Area
E	164 (5%)	279	269	-3.6	5.9	47.1	45.4	NE
F	171 (5%)	264	247	-6.4	14.1	18.7	17.5	NE
F	173	3,815	3,768	-1.2	217.0	17.6	17.4	NE
F	174	3,406	3,252	-4.5	86.0	39.6	37.8	NE
F	175 (45%)	4,055	3,951	-2.6	79.5	51.0	49.7	NE
F	194	361	417	15.5	332.6	1.1	1.3	NE
F	195 (60%)	5,224	5,417	3.7	116.2	45.0	46.6	NE
F	196	2,639	2,828	7.2	185.3	14.2	15.3	NE
F	197	7,736	8,186	5.8	210.8	36.7	38.8	NE
F	198	6,966	6,778	-2.7	133.4	52.2	50.8	NE
F	199	5,390	5,207	-3.4	164.6	32.7	31.6	NE
F	200	2,176	1,971	-9.4	79.6	27.3	24.8	NE
F	201	8,049	7,329	-8.9	215.7	37.3	34.0	NE
F	202(70%)	4,271	3,917	-8.3	132.2	32.3	29.6	NE
F	203	3,780	3,334	-11.8	130.0	29.1	25.6	NE
F	204	3,805	3,643	-4.3	101.8	37.4	35.8	NE
F	205 (85%)	2,941	3,060	4.0	301.0	9.8	10.2	NE
G	177 (20%)	1,719	1,683	-2.1	35.3	48.7	47.7	NE
G	178 (75%)	4,689	4,493	-4.2	125.6	37.3	35.8	NE
G	179	6,435	6,233	-3.1	167.8	38.3	37.1	NE
G	180	8,419	8,388	-0.4	201.1	41.9	41.7	NE
G	181	197	203	3.0	170.7	1.2	1.2	NE
G	182	375	376	0.3	581.7	0.6	0.6	NE
G	182.99*	0	0	N/A	N/A	N/A	N/A	NE

G	183	4,225	4,136	-2.1	520.6	8.1	7.9	NE
G	184	2,306	2,325	0.8	282.4	8.2	8.2	NE
G	185	134	129	-3.7	163.6	0.8	0.8	NE
G	186	4,821	4,711	-2.3	176.2	27.4	26.7	NE
G	187	1,773	1,804	1.7	198.9	8.9	9.1	NE
G	188	7,167	7,113	-0.8	166.3	43.1	42.8	NE
G	189	1,013	1,014	0.1	252.5	4.0	4.0	NE
G	190	6,428	6,326	-1.6	196.9	32.6	32.1	NE
G	191	6,060	5,774	-4.7	359.5	16.9	16.1	NE
G	192	7,078	7,008	-1.0	162.8	43.5	43.0	NE
G	193	134	138	3.0	280.7	0.5	0.5	NE
I	206 (10%)	161	150	-6.8	31.8	5.1	4.7	NE
I	237 (40%)	2,140	2,056	-3.9	107.0	20.0	19.2	NE
I	238 (25%)	1,163	1,130	-2.8	48.8	23.8	23.2	NE
I	240 (30%)	1,258	1,288	2.4	45.9	27.4	28.1	NE
I	241 (75%)	1,121	1,182	5.4	76.0	14.8	15.6	NE
I	242	4,312	4,093	-5.1	132.7	32.5	30.8	NE
I	243	4,294	4,228	-1.5	167.0	25.7	25.3	NE
I	244	3,671	3,456	-5.9	103.8	35.4	33.3	NE
I	245	4,527	4,591	1.4	199.4	22.7	23.0	NE
I	246	3,310	3,194	-3.5	153.2	21.6	20.8	NE
I	247	5,640	5,615	-0.4	231.8	24.3	24.2	NE
I	248	2,210	1,978	-10.5	80.6	27.4	24.5	NE
I	249	4,144	4,038	0.0	80.3	51.6	50.3	NE
I	250	914	857	-6.2	184.1	5.0	4.7	NE
I	251	2,275	2,210	-2.9	132.2	17.2	16.7	NE
I	252	7,379	7,088	-3.9	233.5	31.6	30.4	NE
I	253	4,315	4,061	-5.9	141.3	30.5	28.7	NE
I	254	4,548	4,375	-3.8	191.0	23.8	22.9	NE
I	255 (95%)	2,753	2,708	-1.6	182.2	15.1	14.9	NE
I	256 (20%)	594	602	1.3	42.9	13.8	14.0	NE
J	258 (55%)	1,011	948	-6.2	79.4	12.7	11.9	NE
J	259 (65%)	3,582	3,504	-2.2	87.9	40.8	39.9	NE
J	260	3,502	3,482	-0.6	133.9	26.2	26.0	NE

J	261	3,625	3,577	-1.3	164.3	22.1	21.8	NE
J	262	5,177	5,141	-0.7	137.1	37.8	37.5	NE
J	263	11,011	10,912	-0.9	272.8	40.4	40.0	NE
J	264	6,443	6,313	-2.0	196.9	32.7	32.1	NE
J	265	5,367	5,205	-3.0	136.4	39.3	38.2	NE
J	266	7,490	7,148	-4.6	222.4	33.7	32.1	NE
J	267	7,834	7,511	100.0	158.9	49.3	47.3	NE
J	268	4,644	4,447	-4.2	189.5	24.5	23.5	NE
J	269	2,294	2,334	1.7	154.2	14.9	15.1	NE
J	270	2,275	2,203	-3.2	158.4	14.4	13.9	NE
J	271	2,455	2,642	7.6	93.2	26.3	28.3	NE
J	272	4,446	4,345	-2.3	162.8	27.3	26.7	NE
J	273	5,525	5,733	3.8	230.5	24.0	24.9	NE
J	274	9,620	10,189	5.9	207.6	46.3	49.1	NE
J	275	4,651	4,801	3.2	152.5	30.5	31.5	NE
J	276	4,250	4,220	-0.7	163.8	25.9	25.8	NE
J	277	5,358	5,106	-4.7	135.7	39.5	37.6	NE
J	278	5,262	4,908	-6.7	180.4	29.2	27.2	NE
J	279	7,901	7,564	-4.3	319.5	24.7	23.7	NE
J	280	5,219	5,157	-1.2	176.7	29.5	29.2	NE
J	281	4,377	4,321	-1.3	125.3	34.9	34.5	NE
J	282	6,016	5,915	-1.7	213.5	28.2	27.7	NE
J	283	8,746	8,262	-5.5	167.8	52.1	49.2	NE
J	284	5,865	5,435	-7.3	117.6	49.9	46.2	NE
J	285	2,259	2,355	4.2	70.7	32.0	33.3	NE
J	286	7,114	7,499	5.4	168.8	42.1	44.4	NE
J	287	2,468	2,606	5.6	87.5	28.2	29.8	NE
J	288	3,853	4,072	5.7	114.9	33.5	35.4	NE
J	289	8,484	8,335	-1.8	292.1	29.0	28.5	NE
J	290	5,670	5,905	4.1	198.7	28.5	29.7	NE
K	291	4,461	4,647	4.2	334.8	13.3	13.9	NE
K	292	3,965	3,989	0.6	421.1	9.4	9.5	NE
K	293	2,878	2,833	-1.6	172.2	16.7	16.5	NE
K	294	3,216	3,183	-1.0	164.6	19.5	19.3	NE

K	295	1,067	1,070	0.3	156.9	6.8	6.8	NE
K	296	1,172	1,181	0.8	58.3	20.1	20.3	NE
K	297	454	461	1.5	176.2	2.6	2.6	NE
K	298	4,216	4,052	-3.9	160.4	26.3	25.3	NE
K	299	4,332	4,202	-3.0	147.8	29.3	28.4	NE
K	300	6,867	6,919	0.8	225.4	30.5	30.7	NE
K	301	5,603	5,696	1.7	180.4	31.1	31.6	NE
K	302	6,514	6,552	0.6	220.9	29.5	29.7	NE
K	303	6,947	6,617	-4.8	208.3	33.4	31.8	NE
K	304	631	715	13.3	307.4	2.1	2.3	NE
K	305	9,557	9,324	-2.4	264.2	36.2	35.3	NE
K	306	6,518	6,668	2.3	247.1	26.4	27.0	NE
K	307	2,929	2,938	0.3	158.6	18.5	18.5	NE
K	308	4,403	4,465	1.4	195.2	22.6	22.9	NE
K	309	3,278	3,320	1.3	158.9	20.6	20.9	NE
K	310	5,636	5,638	0.0	266.4	21.2	21.2	NE
K	311	7,940	7,839	-1.3	185.1	42.9	42.4	NE
K	312	3,857	3,841	-0.4	102.3	37.7	37.5	NE
K	313	5,396	5,320	-1.4	178.2	30.3	29.9	NE
K	314	9,575	9,396	-1.9	280.5	34.1	33.5	NE
K	315	9,379	9,175	-2.2	293.3	32.0	31.3	NE
K	316	5,530	5,338	-3.5	180.9	30.6	29.5	NE
K	317	5,581	5,327	-4.6	217.0	25.7	24.5	NE
K	318	3,456	3,427	-0.8	117.9	29.3	29.1	NE
K	319	4,810	4,758	-1.1	188.8	25.5	25.2	NE
K	320	6,449	6,209	-3.7	171.0	37.7	36.3	NE
K	321	3,906	3,862	-1.1	136.4	28.6	28.3	NE
K	322	179	159	-11.2	138.4	1.3	1.1	NE
K	323	3,596	3,499	-2.7	150.2	23.9	23.3	NE
K	324	15	16	6.7	168.3	0.1	0.1	NE
K	325	5,747	5,673	-1.3	207.8	27.7	27.3	NE
K	326	6,733	6,571	-2.4	199.9	33.7	32.9	NE
K	327	307	268	-12.7	340.8	0.9	0.8	NE
K	329	4,216	4,178	-0.9	233.0	18.1	17.9	NE

K	330	7,408	7,137	-3.7	184.1	40.2	38.8	NE
K	331	9,099	9,077	-0.2	294.3	30.9	30.8	NE
K	332	2,594	2,505	-3.4	207.1	12.5	12.1	NE
K	333	4,025	4,024	0.0	257.2	15.6	15.6	NE
K	334	4,456	4,291	-3.7	291.1	15.3	14.7	NE
K	335	3,400	3,394	-0.2	226.6	15.0	15.0	NE
K	336	6,148	5,903	-4.0	279.5	22.0	21.1	NE
K	337	9,025	8,808	-2.4	504.3	17.9	17.5	NE
K	338	5,461	5,426	-0.6	344.5	15.9	15.8	NE
K	339	2,862	2,837	-0.9	281.7	10.2	10.1	NE
K	340	2,518	2,388	-5.2	187.1	13.5	12.8	NE
K	341	5,567	5,522	-0.8	333.8	16.7	16.5	NE
K	342	3,369	3,529	4.7	245.1	13.7	14.4	NE
K	367$	3	3	0.0	1.2	N/A	N/A	
L	328	5,371	5,026	-6.4	662.2	8.1	7.6	NE
L	343	168	168	0.0	1,336.3	0.1	0.1	NE
L	344	7,792	7,378	-5.3	852.0	9.1	8.7	NE
L	345	7,947	9,333	17.4	355.6	22.3	26.2	NE
L	346	1,397	1,380	-1.2	453.7	3.1	3.0	NE
L	347	10,557	9,980	-5.5	530.8	19.9	18.8	NE
L	348	14,902	14,541	-2.4	967.7	15.4	15.0	NE
L	349	7,002	6,781	-3.2	483.3	14.5	14.0	NE
L	351	3,808	4,515	18.6	243.6	15.6	18.5	NE
L	352	4,580	4,481	-2.2	461.8	9.9	9.7	NE
L	353	10,742	10,412	-3.1	757.1	14.2	13.8	NE
L	354	31	31	0.0	1,889.9	0.0	0.0	NE
L	355	6,953	6,402	-7.9	576.0	12.1	11.1	NE
L	356	8,376	8,874	5.9	850.0	9.9	10.4	NE
L	357	8,670	8,740	0.8	530.3	16.3	16.5	NE
L	358	6,113	5,664	-7.3	434.7	14.1	13.0	NE
L	359	5,454	6,241	14.4	558.5	9.8	11.2	NE
L	360	3,061	3,219	5.2	575.3	5.3	5.6	NE
L	361	4,046	3,742	-7.5	300.0	13.5	12.5	NE
L	362	17,971	17,385	-3.3	904.6	19.9	19.2	NE

L	363	15,723	14,767	-6.1	1,336.8	11.8	11.0	NE
L	364	547	522	-4.6	1,072.7	0.5	0.5	NE
L	365	9,336	10,576	13.3	888.3	10.5	11.9	NE
Subtotal:		**760,451**	**750,751**	**-1.3**	**42,959.3**	**17.7**	**17.5**	
A	1	2,073	2,951	42.4	175.2	11.8	16.8	SE
A	2	1,403	1,480	5.5	100.6	13.9	14.7	SE
A	4 (35%)	1,122	936	-16.6	45.2	24.8	20.7	SE
A	5	1,055	1,406	33.3	106.5	9.9	13.2	SE
A	6	349	342	-2.0	42.3	8.3	8.1	SE
A	7 (50%)	1,535	1,708	11.3	31.0	49.5	55.1	SE
A	8 (50%)	3,819	3,707	-2.9	49.6	77.0	74.7	SE
A	9	4,234	4,434	4.7	64.7	65.4	68.5	SE
A	10	5,715	6,158	7.8	174.2	32.8	35.4	SE
A	11	5,594	5,376	-3.9	91.9	60.9	58.5	SE
A	12 (45%)	3,803	3,879	2.0	71.4	53.3	54.3	SE
A	366	400	400	0.0	250.8	1.6	1.6	
A	366.99*	31	31	0.0	N/A	N/A	N/A	
B	14 (30%)	1,129	1,182	4.7	23.8	47.4	49.7	SE
B	15	2,537	2,568	1.2	58.6	43.3	43.8	SE
B	16	1,943	2,430	25.1	49.4	39.3	49.2	SE
B	17	2,493	2,951	18.4	50.7	49.2	58.2	SE
B	18	3,247	3,089	-4.9	59.3	54.8	52.1	SE
B	19 (35%)	847	666	-21.4	28.5	29.7	23.4	SE
B	21 (80%)	2,109	2,062	-2.2	47.0	44.9	43.9	SE
B	22 (90%)	1,976	1,947	-1.5	53.2	37.1	36.6	SE
B	23	2,529	2,375	-6.1	52.6	48.1	45.2	SE
B	24	4,311	4,125	-4.3	132.0	32.7	31.3	SE
B	25	3,435	2,849	-17.1	98.6	34.8	28.9	SE
B	26	0	0	0.0	113.7	0.0	0.0	SE
B	27	7,365	6,825	-7.3	146.5	50.3	46.6	SE
B	28	8,968	8,714	-2.8	146.0	61.4	59.7	SE
B	29	4,017	3,535	-12.0	89.7	44.8	39.4	SE

B	30 (40%)	3,346	3,464	3.5	47.0	71.2	73.7	SE
B	39 (5%)	593	558	-5.9	11.1	53.4	50.3	SE
B	40	9,447	8,723	-7.7	160.1	59.0	54.5	SE
B	41	13,326	12,621	-5.3	191.8	69.5	65.8	SE
B	42	11,081	10,791	-2.6	198.4	55.9	54.4	SE
B	43	46	75	100.0	466.5	0.1	0.2	SE
B	43.99 *	0	0	0.0	N/A	N/A	N/A	SE
B	44	1,078	1,003	-7.0	142.6	7.6	7.0	SE
B	45	3,255	3,111	-4.4	123.3	26.4	25.2	SE
B	48	526	477	-9.3	112.2	4.7	4.3	SE
B	49	0	0	0.0	1,092.9	0.0	0.0	SE
B	50 (60%)	1,337	1,285	-3.9	666.0	2.0	1.9	SE
B	50.99(60%)*	1,372	1,156	-15.7	N/A	N/A	N/A	SE
E	125 (40%)	1,445	1,479	2.4	82.9	17.4	17.8	SE
E	126	635	784	23.5	90.7	7.0	8.6	SE
E	127	399	416	4.3	83.3	4.8	5.0	SE
E	128	163	220	35.0	63.5	2.6	3.5	SE
E	129	430	552	28.4	89.5	4.8	6.2	SE
E	130	1,009	1,117	10.7	51.4	19.6	21.7	SE
E	131	2,200	1,988	-9.6	79.1	27.8	25.1	SE
E	132	4,166	3,604	-13.5	107.0	38.9	33.7	SE
E	133	2,264	1,990	-12.1	88.7	25.5	22.4	SE
E	134 (50%)	2,701	2,648	-2.0	52.9	51.1	50.1	SE
E	135 (95%)	3,540	3,652	3.2	95.3	37.1	38.3	SE
E	136 (10%)	588	560	-4.8	10.0	58.8	56.0	SE
E	137(50%)	3,287	3,119	-5.1	75.0	43.8	41.6	SE
E	138 (90%)	2,647	2,337	-11.7	78.3	33.8	29.8	SE
E	139	4,785	4,298	-10.2	140.1	34.2	30.7	SE
E	140	3,594	3,122	-13.1	105.5	34.1	29.6	SE
E	141	2,768	2,434	-12.1	141.3	19.6	17.2	SE
E	142	2,190	2,191	0.0	196.2	11.2	11.2	SE
E	144	3,331	3,369	1.1	154.2	21.6	21.8	SE
E	145	2,006	1,708	-14.9	80.1	25.0	21.3	SE
E	146	3,322	3,081	-7.3	112.7	29.5	27.3	SE

E	147	2,437	1,895	-22.2	85.5	28.5	22.2	SE
E	148	1,278	1,058	-17.2	47.2	27.1	22.4	SE
E	149	5,834	5,397	-7.5	110.0	53.0	49.1	SE
E	151 (75%)	6,911	6,407	-7.3	140.3	49.3	45.7	SE
E	152	8,134	6,827	-16.1	161.9	50.2	42.2	SE
E	153	3,621	2,970	-18.0	113.7	31.8	26.1	SE
E	154	1,819	1,851	1.8	76.8	23.7	24.1	SE
E	155	3,413	2,951	-13.5	104.0	32.8	28.4	SE
E	156	2,386	2,192	-8.1	106.0	22.5	20.7	SE
E	157	2,764	2,893	4.7	122.3	22.6	23.7	SE
E	162	2,858	2,554	-10.6	86.2	33.2	29.6	SE
E	163	4,147	4,168	0.5	139.6	29.7	29.9	SE
E	164 (95%)	5,310	5,105	-3.9	112.5	47.2	45.4	SE
E	165	3,870	3,323	-14.1	99.1	39.1	33.5	SE
E	166	1,475	1,332	-9.7	63.3	23.3	21.0	SE
E	167	8,509	7,670	-9.9	151.2	56.3	50.7	SE
E	168	5,370	5,155	-4.0	142.8	37.6	36.1	SE
E	169 (40%)	4,911	4,507	-8.2	106.6	46.1	42.3	SE
F	170 (45%)	1,767	1,666	-5.7	176.6	10.0	9.4	SE
F	171 (20%)	1,055	991	-6.1	56.6	18.6	17.5	SE
F	172 (30%)	2,993	2,828	-5.5	41.5	72.1	68.1	SE
F	175 (55%)	4,955	4,828	-2.6	97.2	51.0	49.7	SE
F	176	11,464	12,055	5.2	243.6	47.1	49.5	SE
F	195 (40%)	3,483	3,612	3.7	77.5	44.9	46.6	SE
F	202 (20%)	1,220	1,119	-8.3	37.8	32.3	29.6	SE
F	205 (15%)	519	540	4.0	53.1	9.8	10.2	SE
G	143	1,470	1,445	-1.7	136.9	10.7	10.6	SE
G	158	6,059	5,748	-5.1	147.0	41.2	39.1	SE
G	159	1,765	1,701	-3.6	171.5	10.3	9.9	SE
G	160	7,973	7,841	-1.7	176.4	45.2	44.5	SE
G	161	6,034	5,834	-3.3	172.0	35.1	33.9	SE
G	177 (80%)	6,878	6,731	-2.1	141.1	48.7	47.7	SE
G	178 (25%)	1,563	1,498	-4.2	41.9	37.3	35.8	SE
I	206 (70%)	1,124	1,051	-6.5	222.5	5.1	4.7	SE

I	207 (10%)	679	696	2.5	35.2	19.3	19.8	SE
I	208 (40%)	605	554	-8.4	88.7	6.8	6.2	SE
I	223 (55%)	206	199	-3.4	754.8	0.3	0.3	SE
I	228 (10%)	145	140	-3.4	17.4	8.3	8.0	SE
I	229 (90%)	288	333	15.6	266.7	1.1	1.2	SE
I	230	434	393	-9.4	308.4	1.4	1.3	SE
I	231	1,293	1,280	-1.0	210.0	6.2	6.1	SE
I	232	870	993	14.1	193.7	4.5	5.1	SE
I	233	3,243	3,076	-5.1	147.5	22.0	20.9	SE
I	234	574	552	-3.8	200.2	2.9	2.8	SE
I	235	1,182	1,101	-6.9	196.4	6.0	5.6	SE
I	236	2,636	2,511	-4.7	241.7	10.9	10.4	SE
I	237 (60%)	3,209	3,085	-3.9	160.4	20.0	19.2	SE
I	238 (75%)	3,487	3,388	-2.8	146.2	23.9	23.2	SE
I	239	1,702	1,608	-5.5	121.1	14.1	13.3	SE
I	240 (70%)	2,935	3,005	2.4	107.1	27.4	28.1	SE
I	241 (25%)	374	393	5.1	25.3	14.8	15.5	SE
I	255 (5%)	145	143	-1.4	9.6	15.1	14.9	SE
I	256 (80%)	2,377	2,406	1.2	171.8	13.8	14.0	SE
I	257	3,448	3,409	-1.1	183.4	18.8	18.6	SE
J	258 (45%)	827	776	-6.2	64.9	12.7	12.0	SE
J	259 (35%)	1,929	1,887	-2.2	47.3	40.8	39.9	SE
Subtotal:		**338,873**	**325,730**	**-3.9**	**15,202.6**	**22.3**	**21.4**	
A	3	2,427	2,635	8.6	139.1	17.4	18.9	SW
A	4 (65%)	2,084	1,736	-16.7	84.0	24.8	20.7	SW
A	7 (50%)	1,534	1,707	11.3	31.0	49.5	55.1	SW
A	8 (50%)	3,818	3,707	-2.9	49.5	77.1	74.9	SW
A	12 (55%)	4,649	4,741	2.0	87.2	53.3	54.4	SW
B	13	4,520	4,243	-6.1	177.7	25.4	23.9	SW
B	14 (70%)	2,634	2,759	4.7	55.5	47.5	49.7	SW
B	19 (65%)	1,572	1,236	-21.4	53.0	29.7	23.3	SW
B	20	2,516	2,459	-2.3	71.9	35.0	34.2	SW

B	21 (20%)	527	515	-2.3	11.8	44.7	43.6	SW
B	22 (10%)	219	216	-1.4	5.9	37.1	36.6	SW
B	30 (60%)	5,018	5,196	3.5	70.6	71.1	73.6	SW
B	31	5,902	5,701	-3.4	97.6	60.5	58.4	SW
B	32	6,147	5,814	-5.4	122.3	50.3	47.5	SW
B	33	6,128	5,647	-7.8	185.6	33.0	30.4	SW
B	34	466	428	-8.2	146.5	3.2	2.9	SW
B	35	95	83	-12.6	406.7	0.2	0.2	SW
B	36	7,429	7,330	-1.3	220.4	33.7	33.3	SW
B	37	10,373	10,163	-2.0	151.7	68.4	67.0	SW
B	38.99	4,092	3,861	-5.6	171.7	23.8	22.5	SW
B	39 (95%)	11,260	10,601	-5.9	211.0	53.4	50.2	SW
B	46	2,391	2,112	-11.7	923.4	2.6	2.3	SW
B	47.98	4,370	4,285	-1.9	205.6	21.3	20.8	SW
B	50 (40%)	892	856	-4.0	444.0	2.0	1.9	SW
B	50.99(40%)*	915	771	-15.7	N/A	N/A	N/A	SW
B	51	1,165	1,270	9.0	596.3	2.0	2.1	SW
C	52	53	67	26.4	2,140.7	0.0	0.0	SW
C	54	1,271	1,493	17.5	436.6	2.9	3.4	SW
C	55	6,293	6,397	1.7	296.5	21.2	21.6	SW
C	56	1,217	1,209	-0.7	207.6	5.9	5.8	SW
C	57	3	0	-100.0	318.5	0.0	0.0	SW
C	58	32	52	100.0	838.9	0.0	0.1	SW
C	59	0	0	0.0	96.4	0.0	0.0	SW
C	60	6,554	6,480	-1.1	268.6	24.4	24.1	SW
C	61	3,146	2,978	-5.3	132.0	23.8	22.6	SW
C	62	4,038	3,953	-2.1	124.8	32.4	31.7	SW
C	63	4,709	4,730	0.4	137.1	34.3	34.5	SW
C	64	4,512	4,374	-3.1	163.8	27.5	26.7	SW
C	65	6,283	6,137	-2.3	286.4	21.9	21.4	SW
C	66	4,218	4,251	0.8	162.1	26.0	26.2	SW
C	67	6,431	6,159	-4.2	248.3	25.9	24.8	SW
C	68	0	0	0.0	225.4	0.0	0.0	SW
C	69	2,520	2,324	-7.8	150.2	16.8	15.5	SW

C	70	5,374	5,275	-1.8	115.9	46.4	45.5	SW
C	71	9,952	9,859	-0.9	165.6	60.1	59.5	SW
C	72	6,112	5,963	-2.4	120.8	50.6	49.4	SW
C	73	3,722	3,506	-5.8	96.6	38.5	36.3	SW
C	74	5,445	5,233	-3.9	167.0	32.6	31.3	SW
C	75	0	0	0.0	123.1	0.0	0.0	SW
D	76	416	389	-6.5	248.3	1.7	1.6	SW
D	77	2,253	2,236	-0.8	80.3	28.1	27.8	SW
D	78	4,776	4,498	-5.8	107.2	44.6	42.0	SW
D	79	4,729	4,565	-3.5	93.2	50.7	49.0	SW
D	80	5,031	4,746	-5.7	105.8	47.6	44.9	SW
D	81	9,314	8,902	-4.4	152.0	61.3	58.6	SW
D	82	8,020	7,527	-6.1	206.1	38.9	36.5	SW
D	83	10,336	10,029	-3.0	232.8	44.4	43.1	SW
D	84	5,286	5,161	-2.4	122.8	43.0	42.0	SW
D	85	7,761	7,623	-1.8	154.2	50.3	49.4	SW
D	86	6,685	6,837	2.3	154.9	43.2	44.1	SW
D	87	7,249	7,410	2.2	133.2	54.4	55.6	SW
D	88	9,190	9,600	4.5	140.6	65.4	68.3	SW
D	89	2,786	2,904	4.2	216.0	12.9	13.4	SW
D	90	4,473	5,070	13.3	110.2	40.6	46.0	SW
D	91	2,968	3,125	5.3	103.5	28.7	30.2	SW
D	92	3,197	3,098	-3.1	127.3	25.1	24.3	SW
D	93	4,922	4,784	-2.8	99.6	49.4	48.0	SW
D	94	4,226	4,255	0.7	92.2	45.8	46.1	SW
D	95	3,877	3,745	-3.4	80.1	48.4	46.8	SW
D	96	4,915	4,798	-2.4	101.3	48.5	47.4	SW
D	97	89	118	32.6	527.1	0.2	0.2	SW
D	98	7,271	7,146	-1.7	223.4	32.5	32.0	SW
D	99	366	364	-0.5	50.9	7.2	7.2	SW
D	100	3,882	3,599	-7.3	136.6	28.4	26.3	SW
D	101	6,389	6,192	-3.1	149.0	42.9	41.6	SW
D	102	3,231	3,262	1.0	88.5	36.5	36.9	SW
D	103	2,933	2,843	-3.1	71.2	41.2	39.9	SW

D	104	4,251	4,171	-1.9	116.6	36.5	35.8	SW
D	105	4,535	4,213	-7.1	165.1	27.5	25.5	SW
D	106	1,622	1,467	-9.6	64.0	25.3	22.9	SW
D	107	4,166	3,946	-5.3	114.4	36.4	34.5	SW
D	108	4,727	4,183	-11.5	132.7	35.6	31.5	SW
D	109	2,503	2,242	-10.4	63.8	39.2	35.1	SW
D	110	4,591	4,534	-1.2	119.8	38.3	37.8	SW
D	111	5,333	5,190	-2.7	325.9	16.4	15.9	SW
D	112	6,547	6,580	0.5	125.0	52.4	52.6	SW
D	113	3,545	3,446	-2.8	85.3	41.6	40.4	SW
D	114	7,232	7,168	-0.9	240.7	30.0	29.8	SW
D	115	3,776	3,525	-6.6	88.5	42.7	39.8	SW
D	116	2,997	2,882	-3.8	185.1	16.2	15.6	SW
D	117	2,088	1,763	-15.6	164.1	12.7	10.7	SW
D	118	7,059	6,919	-2.0	232.3	30.4	29.8	SW
D	119	6,302	6,478	2.8	172.5	36.5	37.6	SW
D	120	1,781	1,832	2.9	148.0	12.0	12.4	SW
D	121	3,007	3,037	1.0	221.2	13.6	13.7	SW
D	122	6,955	7,001	0.7	353.4	19.7	19.8	SW
D	123	117	119	1.7	1,362.5	0.1	0.1	SW
D	124	8	7	100.0	298.7	0.0	0.0	SW
E	125 (60%)	2,167	2,218	2.4	124.4	17.4	17.8	SW
E	134 (50%)	2,700	2,647	-2.0	52.9	51.0	50.0	SW
E	135 (5%)	186	192	3.2	5.0	37.2	38.4	SW
E	136 (90%)	5,294	5,044	-4.7	89.8	59.0	56.2	SW
E	137 (50%)	3,286	3,118	-5.1	75.0	43.8	41.6	SW
E	138 (10%)	294	260	-11.6	8.7	33.8	29.9	SW
E	150	97	152	56.7	588.8	0.2	0.3	SW
E	151 (25%)	2,304	2,136	-7.3	46.8	49.2	45.6	SW
E	169 (60%)	7,367	6,761	-8.2	160.0	46.0	42.3	SW
F	170 (55%)	2,160	2,036	-5.7	215.8	10.0	9.4	SW
F	171 (75%)	3,957	3,716	-6.1	212.3	18.6	17.5	SW
F	172 (70%)	6,983	6,598	-5.5	96.9	72.1	68.1	SW
F	202 (10%)	611	560	-8.3	18.8	32.5	29.8	SW

H	209	3,080	2,899	-5.9	131.5	23.4	22.0	SW
H	210	5,505	5,417	-1.6	210.5	26.2	25.7	SW
H	211	2,608	2,462	-5.6	134.9	19.3	18.3	SW
H	212	2,474	2,380	-3.8	122.3	20.2	19.5	SW
H	213	3,830	3,673	-4.1	134.4	28.5	27.3	SW
H	214	3,867	3,629	-6.2	157.2	24.6	23.1	SW
H	215	3,542	3,390	-4.3	270.1	13.1	12.6	SW
H	216	1,464	1,476	0.8	432.9	3.4	3.4	SW
H	217	6,376	6,098	-4.4	388.7	16.4	15.7	SW
H	218	4,053	3,983	-1.7	250.8	16.2	15.9	SW
H	219	1,404	1,373	-2.2	382.3	3.7	3.6	SW
H	220	1,600	1,845	15.3	719.1	2.2	2.6	SW
H	221	1,167	1,135	-2.7	161.9	7.2	7.0	SW
H	222	1,555	1,787	14.9	505.3	3.1	3.5	SW
I	206 (20%)	321	300	-6.5	63.5	5.1	4.7	SW
I	207 (90%)	6,114	6,268	2.5	317.2	19.3	19.8	SW
I	208 (60%)	908	831	-8.5	133.0	6.8	6.2	SW
I	223 (45%)	168	162	-3.6	617.6	0.3	0.3	SW
I	224	335	321	-4.2	160.4	2.1	2.0	SW
I	225	506	536	5.9	221.7	2.3	2.4	SW
I	226	472	452	-4.2	152.5	3.1	3.0	SW
I	227	1,423	1,514	6.4	141.6	10.0	10.7	SW
I	228 (90%)	1,302	1,260	-3.2	156.8	8.3	8.0	SW
I	229 (10%)	32	37	15.6	29.6	1.1	1.3	SW
Subtotal:		**486,253**	**474,707**	**-2.4**	**28,321.8**	**17.2**	**16.8**	
Total:		**1,585,577**	**1,551,188**	**-2.2**	**86,483.7**	**18.3**	**17.9**	

* Population living on boats, adjacent to tract

$ One house, minimal acerage

Projections obtained from National Planning Data Corporation (1991)

City of Philadelphia 1980-1990
Census Data Comparison
Summary Chart

Planning Analysis Section	Population				Housing				
	1980 Total Population	1990 Total Population	Percent Change 80 - 90	Total Acreage	1980 Total Housing Units	1990 Total Housing Units	Percent Change 80 - 90	1980 Housing Density Persons/ EDU	1990 Housing Density Persons/ EDU
A	43,552	45,645	4.8	1,594	30,370	33,816	11.3	1.4	1.3
B	188,318	170,944	-9.2	8,691	78,522	74,987	-4.5	2.4	2.3
C	86,328	81,885	-5.1	7,023	32,156	31,433	-2.2	2.7	2.6
D	232,979	219,713	-5.7	8,888	97,226	94,940	-2.4	2.4	2.3
E	170,611	146,491	-14.1	5,104	71,711	65,770	-8.3	2.4	2.2
F	113,693	106,045	-6.7	3,827	43,855	39,406	-10.1	2.6	2.7
G	100,865	94,715	-6.1	5,030	40,886	39,587	-3.2	2.5	2.4
H	45,440	42,525	-6.4	4,002	18,247	19,430	6.5	2.5	2.2
I	110,455	103,266	-6.5	8,367	48,224	46,851	-2.8	2.3	2.2
J	184,039	176,550	-4.1	5,584	68,024	66,428	-2.3	2.7	2.7
K	248,559	237,251	-4.5	11,352	99,929	100,289	0.4	2.5	2.4
L	163,371	160,547	-1.7	17,021	55,981	61,962	10.7	2.9	2.6
Total:	**1,688,210**	**1,585,577**	**-6.1**	**86,483**	**685,131**	**674,899**	**2.5**	**2.3**	**2.3**

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City of Philadelphia 1980-1990
Census Data Comparison

Planning Analysis Section	Tract No.	Population: 1980 Total Population	Population: 1990 Total Population	Population: Percent Change 80 - 90	Housing: 1980 Total Housing Units	Housing: 1990 Total Housing Units	Housing: Percent Change 80 - 90	1980 Housing Density Person EDU	1990 Housing Density Persons EDU	Acres	WWTP Service Area
A	1	656	2,073	216.0	425	1,665	291.8	1.5	1.2	175.2	SE
A	2	1,150	1,403	22.0	522	437	-16.3	2.2	3.2	100.6	SE
A	3	2,160	2,427	12.4	1,388	1,638	18.0	1.6	1.5	139.1	SW
A	4	4,533	3,206	-29.3	3,365	2,726	-19.0	1.3	1.2	129.2	SE/SW
A	5	461	1,055	128.9	432	806	86.6	1.1	1.3	106.5	SE
A	6	279	349	25.1	199	228	14.6	1.4	1.5	42.3	SE
A	7	2,448	3,069	25.4	1,910	2,334	22.2	1.3	1.3	62.0	SE
A	8	8,110	7,637	-5.8	6,167	6,410	3.9	1.3	1.2	99.1	SE
A	9	4,230	4,234	0.1	3,078	3,529	14.7	1.4	1.2	64.7	SE
A	10	5,213	5,715	9.6	3,183	3,786	18.9	1.6	1.5	174.2	SE
A	11	5,993	5,594	-6.7	4,275	4,113	-3.8	1.4	1.4	91.9	SE
A	12	8,319	8,452	1.6	5,426	5,789	6.7	1.5	1.5	158.6	SE/SW
A	366	0	400	100.0	0	355	100.0	0.0	1.1	250.8	SE
A	366.99 *	0	31	100.0	N/A	N/A	N/A	N/A	N/A	N/A	SE
Subtotal:		**43,552**	**45,645**	**4.8**	**30,370**	**33,816**	**11.3**	**1.4**	**1.3**	**1,594.2**	
B	13	5,152	4,520	-12.3	2,701	2,363	-12.5	1.9	1.9	177.7	SW
B	14	3,469	3,763	8.5	2,241	2,148	-4.1	1.5	1.8	79.3	SE/SW
B	15	2,512	2,537	1.0	1,300	1,472	13.2	1.9	1.7	58.6	SE
B	16	1,837	1,943	5.8	1,209	1,196	-1.1	1.5	1.6	49.4	SE
B	17	2,149	2,493	16.0	1,236	1,522	23.1	1.7	1.6	50.7	SE
B	18	3,625	3,247	-10.4	1,698	1,704	0.4	2.1	1.9	59.3	SE

B	19	3,788	2,419	-36.1	2,177	1,284	-41.0	1.7	1.9	81.5	SE/SW
B	20	2,681	2,516	-6.2	1,265	1,105	-12.6	2.1	2.3	71.9	SW
B	21	2,814	2,636	-6.3	1,356	1,205	-11.1	2.1	2.2	58.8	SE/SW
B	22	2,262	2,195	-3.0	1,138	1,099	-3.4	2.0	2.0	59.1	SE/SW
B	23	2,908	2,529	-13.0	1,330	1,237	-7.0	2.2	2.0	52.6	SE
B	24	4,760	4,311	-9.4	2,119	2,173	2.5	2.2	2.0	132.0	SE
B	25	4,960	3,435	-30.7	2,058	2,033	-1.2	2.4	1.7	98.6	SE
B	26	0	0	0.0	0	0	0.0	0.0	0.0	113.7	SE
B	27	8,576	7,365	-14.1	3,705	3,328	-10.2	2.3	2.2	146.5	SE
B	28	9,632	8,968	-6.9	3,986	4,022	0.9	2.4	2.2	146.0	SE
B	29	5,163	4,017	-22.2	2,250	2,041	-9.3	2.3	2.0	89.7	SE
B	30	8,090	8,364	3.4	3,444	3,403	-1.2	2.3	2.5	117.6	SE/SW
B	31	6,422	5,902	-8.1	3,007	2,712	-9.8	2.1	2.2	97.6	SW
B	32	6,926	6,147	-11.2	2,672	2,403	-10.1	2.6	2.6	122.3	SW
B	33	7,271	6,128	-15.7	2,770	2,521	-9.0	2.6	2.4	185.6	SW
B	34	557	466	-16.3	246	200	-18.7	2.3	2.3	146.5	SW
B	35	123	95	-22.8	67	58	-13.4	1.8	1.6	406.7	SW
B	36	7,813	7,429	-4.9	3,248	3,057	-5.9	2.4	2.4	220.4	SW
B	37	11,021	10,373	-5.9	4,218	4,253	0.8	2.6	2.4	151.7	SW
B	38.99	4,640	4,092	-11.8	1,753	1,707	-2.6	2.6	2.4	171.7	SW
B	39	13,576	11,853	-12.7	5,418	5,438	0.4	2.5	2.2	222.1	SE/SW
B	40	11,188	9,447	-15.6	4,427	4,365	-1.4	2.5	2.2	160.1	SE
B	41	14,936	13,326	-10.8	5,787	5,357	-7.4	2.6	2.5	191.8	SE
B	42	11,763	11,081	-5.8	4,191	4,211	0.5	2.8	2.6	198.4	SE
B	43	0	46	100.0	0	24	100.0	0.0	1.9	466.5	SE
B	43.99 *	58	0	-100.0	N/A	N/A	N/A	N/A	N/A	N/A	SE
B	44	1,253	1,078	-14.0	479	443	-7.5	2.6	2.4	142.6	SE
B	45	3,609	3,255	-9.8	1,399	1,411	0.9	2.6	2.3	123.3	SE
B	46	3,072	2,391	-22.2	1,014	799	-21.2	3.0	3.0	923.4	SE
B	47.98	4,663	4,370	-6.3	1,473	1,458	-1.0	3.2	3.0	205.6	SE
B	48	584	526	-9.9	220	216	-1.8	2.7	2.4	112.2	SE
B	49	2	0	-100.0	1	0	-100.0	2.0	0.0	1,092.9	SE
B	50	3,019	2,229	-26.2	522	464	-11.1	5.8	4.8	1,110.0	SE/SW
B	50.99 *	852	2,287	168.4	N/A	N/A	N/A	N/A	N/A	N/A	SE/SW

B	51	592	1,165	96.8	397	555	39.8	1.5	2.1	596.3	SW
Subtotal:		**188,318**	**170,944**	**-9.2**	**78,522**	**74,987**	**-4.5**	**0.0 2.4**	**2.3**	**8,690.7**	
C	52	31	53	71.0	13	24	84.6	0.0 2.4	2.2	2,140.7	SW
C	54	935	1,271	35.9	598	707	18.2	1.6	1.8	436.6	SW
C	55	6,274	6,293	0.3	2,384	2,565	7.6	2.6	2.5	296.5	SW
C	56	1,259	1,217	-3.3	572	553	-3.3	2.2	2.2	207.6	SW
C	57	81	3	-96.3	32	4	-87.5	2.5	0.8	318.5	SW
C	58	0	32	100.0	0	37	100.0	0.0	0.9	838.9	SW
C	59	0	0	0.0	0	0	0.0	0.0	0.0	96.4	SW
C	60	6,848	6,554	-4.3	2,660	2,768	4.1	2.6	2.4	268.6	SW
C	61	3,548	3,146	-11.3	1,220	1,193	-2.2	2.9	2.6	132.0	SW
C	62	4,292	4,038	-5.9	1,608	1,581	-1.7	2.7	2.6	124.8	SW
C	63	4,468	4,709	5.4	1,847	1,775	-3.9	2.4	2.7	137.1	SW
C	64	4,861	4,512	-7.2	1,737	1,680	-3.3	2.8	2.7	163.8	SW
C	65	6,716	6,283	-6.4	2,433	2,295	-5.7	2.8	2.7	286.4	SW
C	66	4,253	4,218	-0.8	1,605	1,574	-1.9	2.6	2.7	162.1	SW
C	67	7,118	6,431	-9.7	2,808	2,743	-2.3	2.5	2.3	248.3	SW
C	68	0	0	0.0	0	0	0.0	0.0	0.0	225.4	SW
C	69	2,974	2,520	-15.3	1,130	1,092	-3.4	2.6	2.3	150.2	SW
C	70	5,633	5,374	-4.6	2,005	1,924	-4.0	2.8	2.8	115.9	SW
C	71	10,371	9,952	-4.0	3,495	3,317	-5.1	3.0	3.0	165.6	SW
C	72	6,476	6,112	-5.6	2,244	2,093	-6.7	2.9	2.9	120.8	SW
C	73	4,227	3,722	-11.9	1,478	1,355	-8.3	2.9	2.7	96.6	SW
C	74	5,963	5,445	-8.7	2,287	2,153	-5.9	2.6	2.5	167.0	SW
C	75	0	0	0.0	0	0	0.0	0.0	0.0	123.1	SW
Subtotal:		**86,328**	**81,885**	**-5.1**	**32,156**	**31,433**	**-2.2**	**2.7**	**2.6**	**7,022.9**	
D	76	1,774	416	-76.6	2	0	-100.0	887.0	ID	248.3	SW
D	77	1,898	2,253	18.7	1,023	931	-9.0	1.9	2.4	80.3	SW
D	78	5,319	4,776	-10.2	2,870	2,448	-14.7	1.9	2.0	107.2	SW
D	79	5,147	4,729	-8.1	2,398	2,427	1.2	2.1	1.9	93.2	SW

D	80	5,508	5,031	-8.7	2,118	1,934	-8.7	2.6	2.6	105.8	SW
D	81	10,325	9,314	-9.8	3,459	3,334	-3.6	3.0	2.8	152.0	SW
D	82	9,140	8,020	-12.3	3,067	2,962	-3.4	3.0	2.7	206.1	SW
D	83	11,136	10,336	-7.2	4,303	4,433	3.0	2.6	2.3	232.8	SW
D	84	5,624	5,286	-6.0	2,165	2,080	-3.9	2.6	2.5	122.8	SW
D	85	8,170	7,761	-5.0	3,632	3,332	-8.3	2.2	2.3	154.2	SW
D	86	6,559	6,685	1.9	3,476	3,186	-8.3	1.9	2.1	154.9	SW
D	87	7,210	7,249	0.5	4,087	4,273	4.6	1.8	1.7	133.2	SW
D	88	8,440	9,190	8.9	2,296	2,600	13.2	3.7	3.5	140.6	SW
D	89	2,246	2,786	24.0	366	702	91.8	6.1	4.0	216.0	SW
D	90	3,805	4,473	17.6	1,396	1,774	27.1	2.7	2.5	110.0	SW
D	91	2,722	2,968	9.0	1,769	1,935	9.4	1.5	1.5	103.5	SW
D	92	3,440	3,197	-7.1	1,640	1,458	-11.1	2.1	2.2	127.3	SW
D	93	5,286	4,922	-6.9	2,453	2,436	-0.7	2.2	2.0	99.6	SW
D	94	4,235	4,226	-0.2	1,754	1,929	10.0	2.4	2.2	92.2	SW
D	95	4,214	3,877	-8.0	1,826	1,743	-4.5	2.3	2.2	80.1	SW
D	96	5,230	4,915	-6.0	2,198	2,111	-4.0	2.4	2.3	101.3	SW
D	97	42	89	111.9	19	46	142.1	2.2	1.9	527.1	SW
D	98	7,677	7,271	-5.3	3,241	3,269	0.9	2.4	2.2	223.4	SW
D	99	380	366	-3.7	134	139	3.7	2.8	2.6	50.9	SW
D	100	4,455	3,882	-12.9	1,747	1,686	-3.5	2.6	2.3	136.6	SW
D	101	6,867	6,389	-7.0	2,778	2,659	-4.3	2.5	2.4	149.0	SW
D	102	3,256	3,231	-0.8	1,514	1,433	-5.4	2.2	2.3	88.5	SW
D	103	3,168	2,933	-7.4	1,382	1,239	-10.3	2.3	2.4	71.2	SW
D	104	4,421	4,251	-3.8	1,601	1,606	0.3	2.8	2.6	116.6	SW
D	105	5,297	4,535	-14.4	2,015	1,796	-10.9	2.6	2.5	165.1	SW
D	106	2,132	1,622	-23.9	1,071	950	-11.3	2.0	1.7	64.0	SW
D	107	4,718	4,166	-11.7	2,186	1,857	-15.1	2.2	2.2	114.4	SW
D	108	5,969	4,727	-20.8	2,601	1,925	-26.0	2.3	2.5	132.7	SW
D	109	3,143	2,503	-20.4	1,289	1,157	-10.2	2.4	2.2	63.8	SW
D	110	4,767	4,591	-3.7	2,366	2,162	-8.6	2.0	2.1	119.8	SW
D	111	5,727	5,333	-6.9	2,390	2,321	-2.9	2.4	2.3	325.9	SW
D	112	6,672	6,547	-1.9	2,663	2,542	-4.5	2.5	2.6	125.0	SW
D	113	3,802	3,545	-6.8	1,545	1,413	-8.5	2.5	2.5	85.3	SW

D	114	7,537	7,232	-4.0	2,999	3,029	1.0	2.5	2.4	240.7	SW
D	115	4,364	3,776	-13.5	1,717	1,682	-2.0	2.5	2.2	88.5	SW
D	116	3,433	2,997	-12.7	1,491	1,442	-3.3	2.3	2.1	185.1	SW
D	117	1,942	2,088	7.5	420	404	-3.8	4.6	5.2	164.1	SW
D	118	7,529	7,059	-6.2	2,388	2,330	-2.4	3.2	3.0	232.3	SW
D	119	6,183	6,302	1.9	2,532	2,488	-1.7	2.4	2.5	172.5	SW
D	120	1,747	1,781	1.9	838	783	-6.6	2.1	2.3	148.0	SW
D	121	2,989	3,007	0.6	1,262	1,283	1.7	2.4	2.3	221.2	SW
D	122	7,249	6,955	-4.1	4,713	5,219	10.7	1.5	1.3	353.4	SW
D	123	85	117	37.6	26	52	100.0	3.3	2.3	1,362.5	SW
D	124	0	8	100.0	0	0	0.0	0.0	ID	298.7	SW
Subtotal:		**232,979**	**219,713**	**-5.7**	**97,226**	**94,940**	**-2.4**	**2.4**	**2.3**	**8,887.7**	
E	125	3,392	3,612	6.5	2,393	3,025	26.4	1.4	1.2	207.3	SE/SW
E	126	409	635	55.3	246	386	56.9	1.7	1.6	90.7	SE
E	127	378	399	5.6	186	207	11.3	2.0	1.9	83.3	SE
E	128	71	163	129.6	61	117	91.8	1.2	1.4	63.5	SE
E	129	288	430	49.3	287	299	4.2	1.0	1.4	89.5	SE
E	130	878	1,009	14.9	383	487	27.2	2.3	2.1	51.4	SE
E	131	2,772	2,200	-20.6	1,000	990	-1.0	2.8	2.2	79.1	SE
E	132	4,722	4,166	-11.8	1,867	1,594	-14.6	2.5	2.6	107.0	SE
E	133	2,676	2,264	-15.4	1,415	1,380	-2.5	1.9	1.6	88.7	SE
E	134	5,694	5,401	-5.1	3,227	3,352	3.9	1.8	1.6	105.8	SE/SW
E	135	3,522	3,726	5.8	1,579	1,553	-1.6	2.2	2.4	100.3	SE/SW
E	136	6,532	5,882	-10.0	3,172	3,493	10.1	2.1	1.7	99.8	SE/SW
E	137	7,220	6,573	-9.0	2,953	2,762	-6.5	2.4	2.4	150.0	SE/SW
E	138	3,728	2,941	-21.1	1,624	1,443	-11.1	2.3	2.0	87.0	SE/SW
E	139	5,404	4,785	-11.5	1,964	1,819	-7.4	2.8	2.6	140.1	SE
E	140	4,622	3,594	-22.2	2,407	2,018	-16.2	1.9	1.8	105.5	SE
E	141	3,536	2,768	-21.7	1,447	1,204	-16.8	2.4	2.3	141.3	SE
E	142	2,232	2,190	-1.9	1,236	1,111	-10.1	1.8	2.0	196.2	SE
E	144	3,362	3,331	-0.9	1,434	1,365	-4.8	2.3	2.4	154.2	SE
E	145	2,764	2,006	-27.4	903	743	-17.7	3.1	2.7	80.1	SE

E	146	3,086	3,322	7.6	1,170	1,021	-12.7	2.6	3.3	112.7	SE
E	147	3,540	2,437	-31.2	1,825	1,710	-6.3	1.9	1.4	85.5	SE
E	148	1,738	1,278	-26.5	821	740	-9.9	2.1	1.7	47.2	SE
E	149	6,853	5,834	-14.9	2,717	2,696	-0.8	2.5	2.2	110.0	SE/SW
E	150	10	97	870.0	4	41	925.0	2.5	2.4	588.8	SW
E	151	10,745	9,215	-14.2	3,996	3,929	-1.7	2.7	2.3	187.1	SE/SW
E	152	11,241	8,134	-27.6	3,923	3,484	-11.2	2.9	2.3	161.9	SE
E	153	5,308	3,621	-31.8	2,718	1,950	-28.3	2.0	1.9	113.7	SE
E	154	2,150	1,819	-15.4	221	290	31.2	9.7	6.3	76.8	SE
E	155	4,565	3,413	-25.2	1,571	1,140	-27.4	2.9	3.0	104.0	SE
E	156	2,857	2,386	-16.5	1,060	756	-28.7	2.7	3.2	106.0	SE
E	157	2,628	2,764	5.2	1,254	1,001	-20.2	2.1	2.8	122.3	SE
E	162	3,537	2,858	-19.2	1,188	949	-20.1	3.0	3.0	86.2	SE
E	163	4,229	4,147	-1.9	1,578	1,281	-18.8	2.7	3.2	139.6	SE
E	164	6,141	5,589	-9.0	2,139	1,751	-18.1	2.9	3.2	118.4	SE/NE
E	165	5,095	3,870	-24.0	1,926	1,674	-13.1	2.6	2.3	99.1	SE
E	166	1,788	1,475	-17.5	852	715	-16.1	2.1	2.1	63.3	SE
E	167	10,391	8,509	-18.1	4,280	3,726	-12.9	2.4	2.3	151.2	SE
E	168	5,903	5,370	-9.0	2,598	2,238	-13.9	2.3	2.4	142.8	SE
E	169	14,604	12,278	-15.9	6,086	5,330	-12.4	2.4	2.3	266.6	SE/SW
Subtotal:		**170,611**	**146,491**	**-14.1**	**71,711**	**65,770**	**-8.3**	**2.4**	**2.2**	**5,104.0**	
F	170	4,532	3,927	-13.3	1,512	1,471	-2.7	3.0	2.7	392.4	SE/SW
F	171	6,076	5,276	-13.2	1,944	1,900	-2.3	3.1	2.8	282.9	SE/SW/NE
F	172	11,316	9,976	-11.8	3,914	3,766	-3.8	2.9	2.6	138.4	SE/SW
F	173	3,993	3,815	-4.5	1,615	1,662	2.9	2.5	2.4	217.0	SE/SW/NE
F	174	3,780	3,406	-9.9	1,667	1,269	-23.9	2.3	2.7	86.0	NE
F	175	9,663	9,010	-6.8	3,382	3,066	-9.3	2.9	2.9	176.7	SE/NE
F	176	10,791	11,464	6.2	4,104	3,814	-7.1	2.6	3.0	243.6	SE
F	194	281	361	28.5	124	138	11.3	2.3	2.6	332.6	NE
F	195	8,399	8,707	3.7	3,182	2,969	-6.7	2.6	2.9	193.7	SE/NE
F	196	2,390	2,639	10.4	968	945	-2.4	2.5	2.8	185.3	SE/NE
F	197	7,213	7,736	7.3	2,379	2,427	2.0	3.0	3.2	210.8	NE

F	198	7,486	6,966	-6.9	2,344	2,232	-4.8	3.2	3.1	133.4	NE
F	199	5,827	5,390	-7.5	2,031	1,683	-17.1	2.9	3.2	164.6	SE/NE
F	200	2,536	2,176	-14.2	983	881	-10.4	2.6	2.5	79.6	NE
F	201	9,799	8,049	-17.9	5,488	3,851	-29.8	1.8	2.1	215.7	NE
F	202	7,359	6,102	-17.1	3,358	2,729	-18.7	2.2	2.2	188.8	SE/NE
F	203	4,752	3,780	-20.5	1,902	1,611	-15.3	2.5	2.3	130.0	NE
F	204	4,217	3,805	-9.8	1,557	1,426	-8.4	2.7	2.7	101.8	NE
F	205	3,283	3,460	5.4	1,401	1,566	11.8	2.3	2.2	354.1	SE/NE
Subtotal:		**113,693**	**106,045**	**-6.7**	**43,855**	**39,406**	**-10.1**	**2.6**	**2.7**	**3,827.4**	
G	143	1,488	1,470	-1.2	704	703	-0.1	2.1	2.1	136.9	SE
G	158	6,786	6,059	-10.7	2,664	2,568	-3.6	2.5	2.4	147.0	SE
G	159	1,926	1,765	-8.4	860	824	-4.2	2.2	2.1	171.5	SE
G	160	8,420	7,973	-5.3	3,234	3,156	-2.4	2.6	2.5	176.4	SE
G	161	6,546	6,034	-7.8	2,858	2,416	-15.5	2.3	2.5	172.0	SE
G	177	9,122	8,597	-5.8	3,746	3,411	-8.9	2.4	2.5	176.4	SE/NE
G	178	6,881	6,252	-9.1	3,007	2,812	-6.5	2.3	2.2	167.5	SE/NE
G	179	6,895	6,435	-6.7	2,690	2,610	-3.0	2.6	2.5	167.8	NE
G	180	8,699	8,419	-3.2	3,696	3,755	1.6	2.4	2.2	201.1	NE
G	181	191	197	3.1	106	103	-2.8	1.8	1.9	170.7	NE
G	182	382	375	-1.8	179	179	0.0	2.1	2.1	581.7	NE
G	182.99 *	43	0	-100.0	N/A	N/A	N/A	N/A	N/A	N/A	NE
G	183	4,501	4,225	-6.1	1,702	1,708	0.4	2.6	2.5	520.6	NE
G	184	2,328	2,306	-0.9	875	885	1.1	2.7	2.6	282.4	NE
G	185	147	134	-8.8	67	69	3.0	2.2	1.9	163.6	NE
G	186	5,163	4,821	-6.6	2,128	2,168	1.9	2.4	2.2	176.2	NE
G	187	1,834	1,773	-3.3	709	727	2.5	2.6	2.4	198.9	NE
G	188	7,432	7,167	-3.6	2,946	2,923	-0.8	2.5	2.5	166.3	NE
G	189	1,077	1,013	-5.9	389	386	-0.8	2.8	2.6	252.5	NE
G	190	6,761	6,428	-4.9	2,649	2,624	-0.9	2.6	2.4	196.9	NE
G	191	6,748	6,060	-10.2	2,795	2,747	-1.7	2.4	2.2	359.5	NE
G	192	7,364	7,078	-3.9	2,832	2,769	-2.2	2.6	2.6	162.8	NE
G	193	131	134	2.3	50	44	-12.0	2.6	3.0	280.7	NE

Subtotal:		**100,865**	**94,715**	**-6.1**	**40,886**	**39,587**	**-3.2**	**2.5**	**2.4**	**5,029.4**	
H	209	3,473	3,080	-11.3	1,402	1,391	-0.8	2.5	2.2	131.5	SW
H	210	5,770	5,505	-4.6	2,270	2,272	0.1	2.5	2.4	210.5	SW
H	211	2,981	2,608	-12.5	1,232	1,199	-2.7	2.4	2.2	134.9	SW
H	212	2,702	2,474	-8.4	1,134	1,098	-3.2	2.4	2.3	122.3	SW
H	213	4,148	3,830	-7.7	1,590	1,622	2.0	2.6	2.4	134.4	SW
H	214	4,417	3,867	-12.5	1,756	1,865	6.2	2.5	2.1	157.2	SW
H	215	3,924	3,542	-9.7	1,485	1,613	8.6	2.6	2.2	270.1	SW
H	216	1,479	1,464	-1.0	656	747	13.9	2.3	2.0	432.9	SW
H	217	7,158	6,376	-10.9	2,498	2,629	5.2	2.9	2.4	388.7	SW
H	218	4,267	4,053	-5.0	2,202	2,476	12.4	1.9	1.6	250.8	SW
H	219	1,494	1,404	-6.0	628	706	12.4	2.4	2.0	382.3	SW
H	220	1,147	1,600	39.5	553	820	48.3	2.1	2.0	719.1	SW
H	221	1,265	1,167	-7.7	478	475	-0.6	2.6	2.5	161.9	SW
H	222	1,215	1,555	28.0	363	517	42.4	3.3	3.0	505.3	SW
Subtotal:		**45,440**	**42,525**	**-6.4**	**18,247**	**19,430**	**6.5**	**2.5**	**2.2**	**4,001.9**	
I	206	1,842	1,606	-12.8	1,105	1,100	-0.5	1.7	1.5	317.8	SE/SW/NE
I	207	6,638	6,793	2.3	3,091	2,700	-12.6	2.1	2.5	352.4	SE/SW
I	208	2,095	1,513	-27.8	1,265	1,248	-1.3	1.7	1.2	221.7	SE/SW
I	223	68	374	450.0	26	144	453.8	2.6	2.6	1,372.4	SE/SW
I	224	375	335	-10.7	129	121	-6.2	2.9	2.8	160.4	SW
I	225	765	506	-33.9	84	104	23.8	9.1	4.9	221.7	SW
I	226	479	472	-1.5	107	103	-3.7	4.5	4.6	152.5	SW
I	227	1,307	1,423	8.9	530	728	37.4	2.5	2.0	141.6	SW
I	228	1,573	1,447	-8.0	811	199	-75.5	1.9	7.3	174.2	SW
I	229	247	320	29.6	88	719	717.0	2.8	2.7	296.3	SE/SW
I	230	384	434	13.0	223	244	9.4	1.7	1.8	308.4	SE
I	231	1,347	1,293	-4.0	566	556	-1.8	2.4	2.3	210.0	SE
I	232	690	870	26.1	316	343	8.5	2.2	2.5	193.7	SE
I	233	3,644	3,243	-11.0	1,512	1,443	-4.6	2.4	2.2	147.5	SE

I	234	631	574	-9.0	221	221	0.0	2.9	2.6	200.2	SE
I	235	1,367	1,182	-13.5	603	498	-17.4	2.3	2.4	196.4	SE
I	236	3,016	2,636	-12.6	1,390	1,362	-2.0	2.2	1.9	241.7	SE
I	237	5,516	5,349	-3.0	2,457	2,443	-0.6	2.2	2.2	267.4	SE/NE
I	238	4,941	4,650	-5.9	2,502	2,463	-1.6	2.0	1.9	195.0	SE/NE
I	239	1,913	1,702	-11.0	1,369	1,345	-1.8	1.4	1.3	121.1	SE
I	240	4,075	4,193	2.9	2,253	2,319	2.9	1.8	1.8	153.0	SE/NE
I	241	1,463	1,495	2.2	846	730	-13.7	1.7	2.0	101.3	SE/NE
I	242	4,807	4,312	-10.3	2,074	1,889	-8.9	2.3	2.3	132.7	NE
I	243	4,511	4,294	-4.8	1,971	2,015	2.2	2.3	2.1	167.0	NE
I	244	4,200	3,671	-12.6	1,639	1,399	-14.6	2.6	2.6	103.8	NE
I	245	4,598	4,527	-1.5	1,925	1,797	-6.6	2.4	2.5	199.4	NE
I	246	3,633	3,310	-8.9	1,415	1,342	-5.2	2.6	2.5	153.2	NE
I	247	5,823	5,640	-3.1	2,273	2,107	-7.3	2.6	2.7	231.8	NE
I	248	2,719	2,210	-18.7	906	829	-8.5	3.0	2.7	80.6	NE
I	249	4,446	4,144	-6.8	1,461	1,453	-0.5	3.0	2.9	80.3	NE
I	250	909	914	0.6	349	334	-4.3	2.6	2.7	184.1	NE
I	251	2,448	2,275	-7.1	965	1,001	3.7	2.5	2.3	132.2	NE
I	252	8,268	7,379	-10.8	3,318	3,077	-7.3	2.5	2.4	233.5	NE
I	253	4,911	4,315	-12.1	2,027	1,923	-5.1	2.4	2.2	141.3	NE
I	254	4,977	4,548	-8.6	2,078	2,057	-1.0	2.4	2.2	191.0	NE
I	255	3,067	2,898	-5.5	1,215	1,326	9.1	2.5	2.2	191.8	SE/NE
I	256	3,071	2,971	-3.3	1,193	1,260	5.6	2.6	2.4	214.7	SE/NE
I	257	3,691	3,448	-6.6	1,921	1,909	-0.6	1.9	1.8	183.4	SE
Subtotal:		**110,455**	**103,266**	**-6.5**	**48,224**	**46,851**	**-2.8**	**2.3**	**2.2**	**8,367.5**	
J	258	2,106	1,838	-12.7	761	778	2.2	2.8	2.4	144.3	SE/NE
J	259	5,862	5,511	-6.0	2,223	2,144	-3.6	2.6	2.6	135.2	SE/NE
J	260	3,625	3,502	-3.4	1,247	1,259	1.0	2.9	2.8	133.9	NE
J	261	3,798	3,625	-4.6	1,464	1,447	-1.2	2.6	2.5	164.3	NE
J	262	5,371	5,177	-3.6	1,838	1,843	0.3	2.9	2.8	137.1	NE
J	263	11,474	11,011	-4.0	3,853	3,829	-0.6	3.0	2.9	272.8	NE
J	264	6,841	6,443	-5.8	2,255	2,288	1.5	3.0	2.8	196.9	NE

J	265	5,798	5,367	-7.4	1,905	1,875	-1.6	3.0	2.9	136.4	NE
J	266	8,328	7,490	-10.1	2,666	2,641	-0.9	3.1	2.8	222.4	NE
J	267	8,650	7,834	-9.4	2,816	2,742	-2.6	3.1	2.9	158.9	NE
J	268	4,933	4,644	-5.9	2,192	2,014	-8.1	2.3	2.3	189.5	NE
J	269	2,023	2,294	13.4	808	728	-9.9	2.5	3.2	154.2	NE
J	270	2,474	2,275	-8.0	995	956	-3.9	2.5	2.4	158.4	NE
J	271	2,206	2,455	11.3	974	1,107	13.7	2.3	2.2	93.2	NE
J	272	4,739	4,446	-6.2	1,938	1,990	2.7	2.4	2.2	162.8	NE
J	273	5,316	5,525	3.9	2,154	2,131	-1.1	2.5	2.6	230.5	NE
J	274	8,911	9,620	8.0	3,714	3,637	-2.1	2.4	2.6	207.6	NE
J	275	4,516	4,651	3.0	1,823	1,709	-6.3	2.5	2.7	152.5	NE
J	276	4,595	4,250	-7.5	1,740	1,814	4.3	2.6	2.3	163.8	NE
J	277	5,984	5,358	-10.5	2,332	2,253	-3.4	2.6	2.4	135.7	NE
J	278	6,005	5,262	-12.4	2,578	2,576	-0.1	2.3	2.0	180.4	NE
J	279	8,549	7,901	-7.6	2,927	2,869	-2.0	2.9	2.8	319.5	NE
J	280	5,463	5,219	-4.5	1,745	1,925	10.3	3.1	2.7	176.7	NE
J	281	4,581	4,377	-4.5	1,591	1,476	-7.2	2.9	3.0	125.3	NE
J	282	6,034	6,016	-0.3	2,352	2,176	-7.5	2.6	2.8	213.5	NE
J	283	9,895	8,746	-11.6	3,637	3,228	-11.2	2.7	2.7	167.8	NE
J	284	6,881	5,865	-14.8	2,236	2,148	-3.9	3.1	2.7	117.6	NE
J	285	2,157	2,259	4.7	889	846	-4.8	2.4	2.7	70.7	NE
J	286	6,630	7,114	7.3	2,513	2,338	-7.0	2.6	3.0	168.8	NE
J	287	2,299	2,468	7.4	916	893	-2.5	2.5	2.8	87.5	NE
J	288	3,595	3,853	7.2	1,516	1,432	-5.5	2.4	2.7	114.9	NE
J	289	8,963	8,484	-5.3	3,271	3,202	-2.1	2.7	2.6	292.1	NE
J	290	5,437	5,670	4.3	2,155	2,134	-1.0	2.5	2.7	198.7	NE
Subtotal:		**184,039**	**176,550**	**-4.1**	**68,024**	**66,428**	**-2.3**	**2.7**	**2.7**	**5,583.9**	
K	291	4,263	4,461	4.6	1,692	1,673	-1.1	2.5	2.7	334.8	NE
K	292	4,015	3,965	-1.2	1,398	1,407	0.6	2.9	2.8	421.1	NE
K	293	3,039	2,878	-5.3	1,270	1,228	-3.3	2.4	2.3	172.2	NE
K	294	3,352	3,216	-4.1	1,492	1,288	-13.7	2.2	2.5	164.6	NE
K	295	1,088	1,067	-1.9	448	427	-4.7	2.4	2.5	156.9	NE

K	296	1,186	1,172	-1.2	515	509	-1.2	2.3	2.3	58.3	NE
K	297	483	454	-6.0	180	186	3.3	2.7	2.4	176.2	NE
K	298	4,609	4,216	-8.5	1,928	1,920	-0.4	2.4	2.2	160.4	NE
K	299	4,698	4,332	-7.8	1,826	1,717	-6.0	2.6	2.5	147.8	NE
K	300	6,937	6,867	-1.0	3,060	2,976	-2.7	2.3	2.3	225.4	NE
K	301	5,544	5,603	1.1	2,564	2,542	-0.9	2.2	2.2	180.4	NE
K	302	6,616	6,514	-1.5	2,583	2,604	0.8	2.6	2.5	220.9	NE
K	303	7,715	6,947	-10.0	2,671	2,621	-1.9	2.9	2.7	208.3	NE
K	304	508	631	24.2	216	272	25.9	2.4	2.3	307.4	NE
K	305	10,220	9,557	-6.5	4,009	4,006	-0.1	2.5	2.4	264.2	NE
K	306	6,526	6,518	-0.1	2,625	2,832	7.9	2.5	2.3	247.1	NE
K	307	2,943	2,929	-0.5	1,388	1,439	3.7	2.1	2.0	158.6	NE
K	308	4,410	4,403	-0.2	1,716	1,742	1.5	2.6	2.5	195.2	NE
K	309	3,286	3,278	-0.2	1,418	1,463	3.2	2.3	2.2	158.9	NE
K	310	5,774	5,636	-2.4	2,286	2,249	-1.6	2.5	2.5	266.4	NE
K	311	8,316	7,940	-4.5	3,182	3,155	-0.8	2.6	2.5	185.1	NE
K	312	3,982	3,857	-3.1	1,652	1,665	0.8	2.4	2.3	102.3	NE
K	313	5,681	5,396	-5.0	2,376	2,360	-0.7	2.4	2.3	178.2	NE
K	314	10,137	9,575	-5.5	4,120	4,099	-0.5	2.5	2.3	280.5	NE
K	315	9,986	9,379	-6.1	4,026	4,012	-0.3	2.5	2.3	293.3	NE
K	316	6,023	5,530	-8.2	2,271	2,252	-0.8	2.7	2.5	180.9	NE
K	317	6,196	5,581	-9.9	2,340	2,376	1.5	2.6	2.3	217.0	NE
K	318	3,591	3,456	-3.8	1,519	1,515	-0.3	2.4	2.3	117.9	NE
K	319	5,023	4,810	-4.2	1,870	1,883	0.7	2.7	2.6	188.8	NE
K	320	7,056	6,449	-8.6	2,663	2,653	-0.4	2.6	2.4	171.0	NE
K	321	4,081	3,906	-4.3	1,614	1,558	-3.5	2.5	2.5	136.4	NE
K	322	225	179	-20.4	73	75	2.7	3.1	2.4	138.4	NE
K	323	3,860	3,596	-6.8	1,560	1,572	0.8	2.5	2.3	150.2	NE
K	324	14	15	7.1	7	9	28.6	2.0	1.7	168.3	NE
K	325	6,011	5,747	-4.4	2,445	2,404	-1.7	2.5	2.4	207.8	NE
K	326	7,195	6,733	-6.4	2,666	2,615	-1.9	2.7	2.6	199.9	NE
K	327	284	307	8.1	104	86	-17.3	2.7	3.6	340.8	NE
K	329	4,385	4,216	-3.9	1,819	1,876	3.1	2.4	2.2	233.0	NE
K	330	8,122	7,408	-8.8	2,890	2,896	0.2	2.8	2.6	184.1	NE

K	331	9,370	9,099	-2.9	3,718	3,729	0.3	2.5	2.4	294.3	NE
K	332	2,824	2,594	-8.1	1,018	1,032	1.4	2.8	2.5	207.1	NE
K	333	3,842	4,025	4.8	1,530	1,620	5.9	2.5	2.5	257.2	NE
K	334	4,812	4,456	-7.4	2,076	2,104	1.3	2.3	2.1	291.1	NE
K	335	3,481	3,400	-2.3	1,411	1,554	10.1	2.5	2.2	226.6	NE
K	336	6,751	6,148	-8.9	3,028	2,870	-5.2	2.2	2.1	279.5	NE
K	337	9,671	9,025	-6.7	4,265	4,424	3.7	2.3	2.0	504.3	NE
K	338	5,655	5,461	-3.4	2,391	2,401	0.4	2.4	2.3	344.5	NE
K	339	3,044	2,862	-6.0	1,310	1,319	0.7	2.3	2.2	281.7	NE
K	340	2,820	2,518	-10.7	994	1,022	2.8	2.8	2.5	187.1	NE
K	341	5,775	5,567	-3.6	2,591	2,601	0.4	2.2	2.1	333.8	NE
K	342	3,134	3,369	7.5	1,115	1,450	30.0	2.8	2.3	245.1	NE
K	367 $	0	3	100.0	0	1	100.0	0.0	3.0	1.2	NE
Subtotal:		**248,559**	**237,251**	**-4.5**	**99,929**	**100,289**	**0.4**	**2.5**	**2.4**	**11,352.5**	
L	328	2,671	5,371	101.1	1	0	-100.0	2671.0	ID	662.2	NE
L	343	171	168	-1.8	54	58	7.4	3.2	2.9	1,336.3	NE
L	344	8,641	7,792	-9.8	2,802	2,822	0.7	3.1	2.8	852.0	NE
L	345	5,852	7,947	35.8	3,150	4,381	39.1	1.9	1.8	355.6	NE
L	346	1,456	1,397	-4.1	911	949	4.2	1.6	1.5	453.7	NE
L	347	11,864	10,557	-11.0	4,043	4,028	-0.4	2.9	2.6	530.8	NE
L	348	15,947	14,902	-6.6	5,853	6,052	3.4	2.7	2.5	967.7	NE
L	349	7,583	7,002	-7.7	2,682	2,676	-0.2	2.8	2.6	483.3	NE
L	351	2,650	3,808	43.7	1,256	2,279	81.4	2.1	1.7	243.6	NE
L	352	4,896	4,580	-6.5	1,683	1,714	1.8	2.9	2.7	461.8	NE
L	353	11,617	10,742	-7.5	3,825	4,004	4.7	3.0	2.7	757.1	NE
L	354	5	31	520.0	2	4	100.0	2.5	7.8	1,889.9	NE
L	355	8,243	6,953	-15.6	3,368	3,006	-10.7	2.4	2.3	576.0	NE
L	356	7,691	8,376	8.9	2,540	3,573	40.7	3.0	2.3	850.0	NE
L	357	8,763	8,670	-1.1	3,742	3,869	3.4	2.3	2.2	530.0	NE
L	358	7,172	6,113	-14.8	2,368	2,344	-1.0	3.0	2.6	434.7	NE
L	359	4,298	5,454	26.9	1,442	2,235	55.0	3.0	2.4	558.5	NE
L	360	2,787	3,061	9.8	829	991	19.5	3.4	3.1	575.3	NE

L	361	4,764	4,046	-15.1	1,569	1,650	5.2	3.0	2.5	300.0	NE
L	362	19,565	17,971	-8.1	6,118	6,484	6.0	3.2	2.8	904.6	NE
L	363	17,998	15,723	-12.6	5,096	5,157	1.2	3.5	3.0	1,336.8	NE
L	364	1,261	547	-56.6	3	2	-33.3	420.3	273.5	1,072.7	NE
L	365	7,476	9,336	24.9	2,644	3,684	39.3	2.8	2.5	888.3	NE
Subtotal:		**163,371**	**160,547**	**-1.7**	**55,981**	**61,962**	**10.7**	**2.9**	**2.6**	**17,020.9**	
Total:		**1,688,210**	**1,585,577**	**-6.1**	**685,131**	**674,899**	**-1.5**	**2.5**	**2.3**	**86,483.0**	

* Population living on boats, adjacent to tract
$ One house, minimal acerage

City of Philadelphia 1980-1990
Census Data Comparison

cenhospl.xls

Planning Analysis Section	Tract No.	Population				Housing					
		1980 Total Population	1990 Total Population	Percent Change 80 - 90	Tract Area Acres	1980 Total Housing Units	1990 Total Housing Units	Percent Change 80 - 90	1980 Housing Density Persons/ EDU	1990 Housing Density Persons/ EDU	WWTP Service Area
E	164 (5%)	307	279	-9.1	5.9	107	88	-17.8	2.9	3.2	NE
F	171 (5%)	304	264	-13.2	14.1	97	95	-2.1	3.1	2.8	NE
F	173	3,993	3,815	-4.5	217.0	1,615	1,662	2.9	2.5	2.3	NE
F	174	3,780	3,406	-9.9	86.0	1,667	1,269	-23.9	2.3	2.7	NE
F	175 (45%)	4,348	4,055	-6.7	79.5	1,522	1,380	-9.3	2.9	2.9	NE
F	194	281	361	28.5	332.6	124	138	11.3	2.3	2.6	NE
F	195 (60%)	5,039	5,224	3.7	116.2	1,909	1,781	-6.7	2.6	2.9	NE
F	196	2,390	2,639	10.4	185.3	968	945	-2.4	2.5	2.8	NE
F	197	7,213	7,736	7.3	210.8	2,379	2,427	2.0	3.0	3.2	NE
F	198	7,486	6,966	-6.9	133.4	2,344	2,232	-4.8	3.2	3.1	NE
F	199	5,827	5,390	-7.5	164.6	2,031	1,683	-17.1	2.9	3.2	NE
F	200	2,536	2,176	-14.2	79.6	983	881	-10.4	2.6	2.5	NE
F	201	9,799	8,049	-17.9	215.7	5,488	3,851	-29.8	1.8	2.1	NE
F	202(70%)	5,151	4,271	-17.1	132.2	2,351	1,910	-18.8	2.2	2.2	NE
F	203	4,752	3,780	-20.5	130.0	1,902	1,611	-15.3	2.5	2.3	NE
F	204	4,217	3,805	-9.8	101.8	1,557	1,426	-8.4	2.7	2.7	NE
F	205 (85%)	2,791	2,941	5.4	301.0	1,191	1,331	11.8	2.3	2.2	NE
G	177 (20%)	1,824	1,719	-5.8	35.3	749	682	-8.9	2.4	2.5	NE
G	178 (75%)	5,161	4,689	-9.1	125.6	2,255	2,109	-6.5	2.3	2.2	NE
G	179	6,895	6,435	-6.7	167.8	2,690	2,610	-3.0	2.6	2.5	NE
G	180	8,699	8,419	-3.2	201.1	3,696	3,755	1.6	2.4	2.2	NE
G	181	191	197	3.1	170.7	106	103	-2.8	1.8	1.9	NE
G	182	382	375	-1.8	581.7	179	179	0.0	2.1	2.1	NE
G	182.99 *	43	0	-100.0	N/A	N/A	N/A	N/A	N/A	N/A	NE

G	183	4,501	4,225	-6.1	520.6	1,702	1,708	0.4	2.6	2.5	NE
G	184	2,328	2,306	-0.9	282.4	875	885	1.1	2.7	2.6	NE
G	185	147	134	-8.8	163.6	67	69	3.0	2.2	1.9	NE
G	186	5,163	4,821	-6.6	176.2	2,128	2,168	1.9	2.4	2.2	NE
G	187	1,834	1,773	-3.3	198.9	709	727	2.5	2.6	2.4	NE
G	188	7,432	7,167	-3.6	166.3	2,946	2,923	-0.8	2.5	2.5	NE
G	189	1,077	1,013	-5.9	252.5	389	386	-0.8	2.8	2.6	NE
G	190	6,761	6,428	-4.9	196.9	2,649	2,624	-0.9	2.6	2.4	NE
G	191	6,748	6,060	-10.2	359.5	2,795	2,747	-1.7	2.4	2.2	NE
G	192	7,364	7,078	-3.9	162.8	2,832	2,769	-2.2	2.6	2.6	NE
G	193	131	134	2.3	280.7	50	44	-12.0	2.6	3.0	NE
I	206 (10%)	184	161	-12.5	31.8	111	110	-0.9	1.7	1.5	NE
I	237 (40%)	2,206	2,140	-3.0	107.0	983	977	-0.6	2.2	2.2	NE
I	238 (25%)	1,235	1,163	-5.8	48.8	626	616	-1.6	2.0	1.9	NE
I	240 (30%)	1,223	1,258	2.9	45.9	676	696	3.0	1.8	1.8	NE
I	241 (75%)	1,097	1,121	2.2	76.0	635	548	-13.7	1.7	2.0	NE
I	242	4,807	4,312	-10.3	132.7	2,074	1,889	-8.9	2.3	2.3	NE
I	243	4,511	4,294	-4.8	167.0	1,971	2,015	2.2	2.3	2.1	NE
I	244	4,200	3,671	-12.6	103.8	1,639	1,399	-14.6	2.6	2.6	NE
I	245	4,598	4,527	-1.5	199.4	1,925	1,797	-6.6	2.4	2.5	NE
I	246	3,633	3,310	-8.9	153.2	1,415	1,342	-5.2	2.6	2.5	NE
I	247	5,823	5,640	-3.1	231.8	2,273	2,107	-7.3	2.6	2.7	NE
I	248	2,719	2,210	-18.7	80.6	906	829	-8.5	3.0	2.7	NE
I	249	4,446	4,144	0.0	80.3	1,461	1,453	-0.5	3.0	2.9	NE
I	250	909	914	0.6	184.1	349	334	-4.3	2.6	2.7	NE
I	251	2,448	2,275	-7.1	132.2	965	1,001	3.7	2.5	2.3	NE
I	252	8,268	7,379	-10.8	233.5	3,318	3,077	-7.3	2.5	2.4	NE
I	253	4,911	4,315	-12.1	141.3	2,027	1,923	-5.1	2.4	2.2	NE
I	254	4,977	4,548	-8.6	191.0	2,078	2,057	-1.0	2.4	2.2	NE
I	255 (95%)	2,914	2,753	-5.5	182.2	1,154	1,260	9.2	2.5	2.2	NE
I	256 (20%)	614	594	-3.3	42.9	239	252	5.4	2.6	2.4	NE
J	258 (55%)	1,158	1,011	-12.7	79.4	419	428	2.1	2.8	2.4	NE
J	259 (65%)	3,810	3,582	-6.0	87.9	1,445	1,394	-3.5	2.6	2.6	NE
J	260	3,625	3,502	-3.4	133.9	1,247	1,259	1.0	2.9	2.8	NE

J	261	3,798	3,625	-4.6	164.3	1,464	1,447	-1.2	2.6	2.5	NE
J	262	5,371	5,177	-3.6	137.1	1,838	1,843	0.3	2.9	2.8	NE
J	263	11,474	11,011	-4.0	272.8	3,853	3,829	-0.6	3.0	2.9	NE
J	264	6,841	6,443	-5.8	196.9	2,255	2,288	1.5	3.0	2.8	NE
J	265	5,798	5,367	-7.4	136.4	1,905	1,875	-1.6	3.0	2.9	NE
J	266	8,328	7,490	-10.1	222.4	2,666	2,641	-0.9	3.1	2.8	NE
J	267	8,650	7,834	100.0	158.9	2,816	2,742	-2.6	3.1	2.9	NE
J	268	4,933	4,644	-5.9	189.5	2,192	2,014	-8.1	2.3	2.3	NE
J	269	2,023	2,294	13.4	154.2	808	728	-9.9	2.5	3.2	NE
J	270	2,474	2,275	-8.0	158.4	995	956	-3.9	2.5	2.4	NE
J	271	2,206	2,455	11.3	93.2	974	1,107	13.7	2.3	2.2	NE
J	272	4,739	4,446	-6.2	162.8	1,938	1,990	2.7	2.4	2.2	NE
J	273	5,316	5,525	3.9	230.5	2,154	2,131	-1.1	2.5	2.6	NE
J	274	8,911	9,620	8.0	207.6	3,714	3,637	-2.1	2.4	2.6	NE
J	275	4,516	4,651	3.0	152.5	1,823	1,709	-6.3	2.5	2.7	NE
J	276	4,595	4,250	-7.5	163.8	1,740	1,814	4.3	2.6	2.3	NE
J	277	5,984	5,358	-10.5	135.7	2,332	2,253	-3.4	2.6	2.4	NE
J	278	6,005	5,262	-12.4	180.4	2,578	2,576	-0.1	2.3	2.0	NE
J	279	8,549	7,901	-7.6	319.5	2,927	2,869	-2.0	2.9	2.8	NE
J	280	5,463	5,219	-4.5	176.7	1,745	1,925	10.3	3.1	2.7	NE
J	281	4,581	4,377	-4.5	125.3	1,591	1,476	-7.2	2.9	3.0	NE
J	282	6,034	6,016	-0.3	213.5	2,352	2,176	-7.5	2.6	2.8	NE
J	283	9,895	8,746	-11.6	167.8	3,637	3,228	-11.2	2.7	2.7	NE
J	284	6,881	5,865	-14.8	117.6	2,236	2,148	-3.9	3.1	2.7	NE
J	285	2,157	2,259	4.7	70.7	889	846	-4.8	2.4	2.7	NE
J	286	6,630	7,114	7.3	168.8	2,513	2,338	-7.0	2.6	3.0	NE
J	287	2,299	2,468	7.4	87.5	916	893	-2.5	2.5	2.8	NE
J	288	3,595	3,853	7.2	114.9	1,516	1,432	-5.5	2.4	2.7	NE
J	289	8,963	8,484	-5.3	292.1	3,271	3,202	-2.1	2.7	2.6	NE
J	290	5,437	5,670	4.3	198.7	2,155	2,134	-1.0	2.5	2.7	NE
K	291	4,263	4,461	4.6	334.8	1,692	1,673	-1.1	2.5	2.7	NE
K	292	4,015	3,965	-1.2	421.1	1,398	1,407	0.6	2.9	2.8	NE
K	293	3,039	2,878	-5.3	172.2	1,270	1,228	-3.3	2.4	2.3	NE
K	294	3,352	3,216	-4.1	164.6	1,492	1,288	-13.7	2.2	2.5	NE

K	295	1,088	1,067	-1.9	156.9	448	427	-4.7	2.4	2.5	NE
K	296	1,186	1,172	-1.2	58.3	515	509	-1.2	2.3	2.3	NE
K	297	483	454	-6.0	176.2	180	186	3.3	2.7	2.4	NE
K	298	4,609	4,216	-8.5	160.4	1,928	1,920	-0.4	2.4	2.2	NE
K	299	4,698	4,332	-7.8	147.8	1,826	1,717	-6.0	2.6	2.5	NE
K	300	6,937	6,867	-1.0	225.4	3,060	2,976	-2.7	2.3	2.3	NE
K	301	5,544	5,603	1.1	180.4	2,564	2,542	-0.9	2.2	2.2	NE
K	302	6,616	6,514	-1.5	220.9	2,583	2,604	0.8	2.6	2.5	NE
K	303	7,715	6,947	-10.0	208.3	2,671	2,621	-1.9	2.9	2.7	NE
K	304	508	631	24.2	307.4	216	272	25.9	2.4	2.3	NE
K	305	10,220	9,557	-6.5	264.2	4,009	4,006	-0.1	2.5	2.4	NE
K	306	6,526	6,518	-0.1	247.1	2,625	2,832	7.9	2.5	2.3	NE
K	307	2,943	2,929	-0.5	158.6	1,388	1,439	3.7	2.1	2.0	NE
K	308	4,410	4,403	-0.2	195.2	1,716	1,742	1.5	2.6	2.5	NE
K	309	3,286	3,278	-0.2	158.9	1,418	1,463	3.2	2.3	2.2	NE
K	310	5,774	5,636	-2.4	266.4	2,286	2,249	-1.6	2.5	2.5	NE
K	311	8,316	7,940	-4.5	185.1	3,182	3,155	-0.8	2.6	2.5	NE
K	312	3,982	3,857	-3.1	102.3	1,652	1,665	0.8	2.4	2.3	NE
K	313	5,681	5,396	-5.0	178.2	2,376	2,360	-0.7	2.4	2.3	NE
K	314	10,137	9,575	-5.5	280.5	4,120	4,099	-0.5	2.5	2.3	NE
K	315	9,986	9,379	-6.1	293.3	4,026	4,012	-0.3	2.5	2.3	NE
K	316	6,023	5,530	-8.2	180.9	2,271	2,252	-0.8	2.7	2.5	NE
K	317	6,196	5,581	-9.9	217.0	2,340	2,376	1.5	2.6	2.3	NE
K	318	3,591	3,456	-3.8	117.9	1,519	1,515	-0.3	2.4	2.3	NE
K	319	5,023	4,810	-4.2	188.8	1,870	1,883	0.7	2.7	2.6	NE
K	320	7,056	6,449	-8.6	171.0	2,663	2,653	-0.4	2.6	2.4	NE
K	321	4,081	3,906	-4.3	136.4	1,614	1,558	-3.5	2.5	2.5	NE
K	322	225	179	-20.4	138.4	73	75	2.7	3.1	2.4	NE
K	323	3,860	3,596	-6.8	150.2	1,560	1,572	0.8	2.5	2.3	NE
K	324	14	15	7.1	168.3	7	9	28.6	2.0	1.7	NE
K	325	6,011	5,747	-4.4	207.8	2,445	2,404	-1.7	2.5	2.4	NE
K	326	7,195	6,733	-6.4	199.9	2,666	2,615	-1.9	2.7	2.6	NE
K	327	284	307	8.1	340.8	104	86	-17.3	2.7	3.6	NE
K	329	4,385	4,216	-3.9	233.0	1,819	1,876	3.1	2.4	2.2	NE

K	330	8,122	7,408	-8.8	184.1	2,890	2,896	0.2	2.8	2.6	NE
K	331	9,370	9,099	-2.9	294.3	3,718	3,729	0.3	2.5	2.4	NE
K	332	2,824	2,594	-8.1	207.1	1,018	1,032	1.4	2.8	2.5	NE
K	333	3,842	4,025	4.8	257.2	1,530	1,620	5.9	2.5	2.5	NE
K	334	4,812	4,456	-7.4	291.1	2,076	2,104	1.3	2.3	2.1	NE
K	335	3,481	3,400	-2.3	226.6	1,411	1,554	10.1	2.5	2.2	NE
K	336	6,751	6,148	-8.9	279.5	3,028	2,870	-5.2	2.2	2.1	NE
K	337	9,671	9,025	-6.7	504.3	4,265	4,424	3.7	2.3	2.0	NE
K	338	5,655	5,461	-3.4	344.5	2,391	2,401	0.4	2.4	2.3	NE
K	339	3,044	2,862	-6.0	281.7	1,310	1,319	0.7	2.3	2.2	NE
K	340	2,820	2,518	-10.7	187.1	994	1,022	2.8	2.8	2.5	NE
K	341	5,775	5,567	-3.6	333.8	2,591	2,601	0.4	2.2	2.1	NE
K	342	3,134	3,369	7.5	245.1	1,115	1,450	30.0	2.8	2.3	NE
K	367 $	0	3	100.0	1.2	0	1	100.0	0.0	3.0	NE
L	328	2,671	5,371	101.1	662.2	1	0	-100.0	2671.0	0.0	NE
L	343	171	168	-1.8	1,336.3	54	58	7.4	3.2	2.9	NE
L	344	8,641	7,792	-9.8	852.0	2,802	2,822	0.7	3.1	2.8	NE
L	345	5,852	7,947	35.8	355.6	3,150	4,381	39.1	1.9	1.8	NE
L	346	1,456	1,397	-4.1	453.7	911	949	4.2	1.6	1.5	NE
L	347	11,864	10,557	-11.0	530.8	4,043	4,028	-0.4	2.9	2.6	NE
L	348	15,947	14,902	-6.6	967.7	5,853	6,052	3.4	2.7	2.5	NE
L	349	7,583	7,002	-7.7	483.3	2,682	2,676	-0.2	2.8	2.6	NE
L	351	2,650	3,808	43.7	243.6	1,256	2,279	81.4	2.1	1.7	NE
L	352	4,896	4,580	-6.5	461.8	1,683	1,714	1.8	2.9	2.7	NE
L	353	11,617	10,742	-7.5	757.1	3,825	4,004	4.7	3.0	2.7	NE
L	354	5	31	520.0	1,889.9	2	4	100.0	2.5	7.8	NE
L	355	8,243	6,953	-15.6	576.0	3,368	3,006	-10.7	2.4	2.3	NE
L	356	7,691	8,376	8.9	850.0	2,540	3,573	40.7	3.0	2.3	NE
L	357	8,763	8,670	-1.1	530.3	3,742	3,869	3.4	2.3	2.2	NE
L	358	7,172	6,113	-14.8	434.7	2,368	2,344	-1.0	3.0	2.6	NE
L	359	4,298	5,454	26.9	558.5	1,442	2,235	55.0	3.0	2.4	NE
L	360	2,787	3,061	9.8	575.3	829	991	19.5	3.4	3.1	NE
L	361	4,764	4,046	-15.1	300.0	1,569	1,650	5.2	3.0	2.5	NE
L	362	19,565	17,971	-8.1	904.6	6,118	6,484	6.0	3.2	2.8	NE

L	363	17,998	15,723	-12.6	1,336.8	5,096	5,157	1.2	3.5	3.0	NE
L	364	1,261	547	-56.6	1,072.7	3	2	-33.3	420.3	273.5	NE
L	365	7,476	9,336	24.9	888.3	2,644	3,684	39.3	2.8	2.5	NE
Subtotal:		**795,587**	**760,451**	**-4.4**	**42,959.3**	**304,691**	**304,459**	**-0.1**	**2.6**	**2.5**	
A	1	656	2,073	216.0	175.2	425	1,665	291.8	1.5	1.2	SE
A	2	1,150	1,403	22.0	100.6	522	437	-16.3	2.2	3.2	SE
A	4 (35%)	1,587	1,122	-29.3	45.2	1,178	954	-19.0	1.3	1.2	SE
A	5	461	1,055	128.9	106.5	432	806	86.6	1.1	1.3	SE
A	6	279	349	25.1	42.3	199	228	14.6	1.4	1.5	SE
A	7 (50%)	1,224	1,535	25.4	31.0	955	1,167	22.2	1.3	1.3	SE
A	8 (50%)	4,055	3,819	-5.8	49.6	3,084	3,205	3.9	1.3	1.2	SE
A	9	4,230	4,234	0.1	64.7	3,078	3,529	14.7	1.4	1.2	SE
A	10	5,213	5,715	9.6	174.2	3,183	3,786	18.9	1.6	1.5	SE
A	11	5,993	5,594	-6.7	91.9	4,275	4,113	-3.8	1.4	1.4	SE
A	12 (45%)	3,744	3,803	1.6	71.4	2,442	2,605	6.7	1.5	1.5	SE
A	366	0	400	100.0	250.8	N/A	355	N/A	N/A	N/A	SE
A	366.99*	0	31	100.0	N/A	N/A	N/A	N/A	N/A	N/A	SE
B	14 (30%)	1,041	1,129	8.5	23.8	672	644	-4.2	1.5	1.8	SE
B	15	2,512	2,537	1.0	58.6	1,300	1,472	13.2	1.9	1.7	SE
B	16	1,837	1,943	5.8	49.4	1,209	1,196	-1.1	1.5	1.6	SE
B	17	2,149	2,493	16.0	50.7	1,236	1,522	23.1	1.7	1.6	SE
B	18	3,625	3,247	-10.4	59.3	1,698	1,704	0.4	2.1	1.9	SE
B	19 (35%)	1,326	847	-36.1	28.5	762	449	-41.1	1.7	1.9	SE
B	21 (80%)	2,251	2,109	-6.3	47.0	1,085	964	-11.2	2.1	2.2	SE
B	22 (90%)	2,036	1,976	-2.9	53.2	1,024	989	-3.4	2.0	2.0	SE
B	23	2,908	2,529	-13.0	52.6	1,330	1,237	-7.0	2.2	2.0	SE
B	24	4,760	4,311	-9.4	132.0	2,119	2,173	2.5	2.2	2.0	SE
B	25	4,960	3,435	-30.7	98.6	2,058	2,033	-1.2	2.4	1.7	SE
B	26	0	0	0.0	113.7	0	0	0.0	0.0	0.0	SE
B	27	8,576	7,365	-14.1	146.5	3,705	3,328	-10.2	2.3	2.2	SE
B	28	9,632	8,968	-6.9	146.0	3,986	4,022	0.9	2.4	2.2	SE
B	29	5,163	4,017	-22.2	89.7	2,250	2,041	-9.3	2.3	2.0	SE

B	30 (40%)	3,236	3,346	3.4	47.0	1,378	1,361	-1.2	2.3	2.5	SE
B	39 (5%)	679	593	-12.7	11.1	271	272	0.4	2.5	2.2	SE
B	40	11,188	9,447	-15.6	160.1	4,427	4,365	-1.4	2.5	2.2	SE
B	41	14,936	13,326	-10.8	191.8	5,787	5,357	-7.4	2.6	2.5	SE
B	42	11,763	11,081	-5.8	198.4	4,191	4,211	0.5	2.8	2.6	SE
B	43	0	46	100.0	466.5	0	24	100.0	0.0	1.9	SE
B	43.99 *	58	0	-100.0	N/A	0	0	0.0	0.0	0.0	SE
B	44	1,253	1,078	-14.0	142.6	479	443	-7.5	2.6	2.4	SE
B	45	3,609	3,255	-9.8	123.3	1,399	1,411	0.9	2.6	2.3	SE
B	48	584	526	-9.9	112.2	220	216	-1.8	2.7	2.4	SE
B	49	2	0	-100.0	1,092.9	1	0	-100.0	2.0	0.0	SE
B	50 (60%)	1,811	1,337	-26.2	666.0	313	278	-11.2	5.8	4.8	SE
B	50.99(60%)*	511	1,372	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SE
E	125 (40%)	1,357	1,445	6.5	82.9	957	1,210	26.4	1.4	1.2	SE
E	126	409	635	55.3	90.7	246	386	56.9	1.7	1.6	SE
E	127	378	399	5.6	83.3	186	207	11.3	2.0	1.9	SE
E	128	71	163	129.6	63.5	61	117	91.8	1.2	1.4	SE
E	129	288	430	49.3	89.5	287	299	4.2	1.0	1.4	SE
E	130	878	1,009	14.9	51.4	383	487	27.2	2.3	2.1	SE
E	131	2,772	2,200	-20.6	79.1	1,000	990	-1.0	2.8	2.2	SE
E	132	4,722	4,166	-11.8	107.0	1,867	1,594	-14.6	2.5	2.6	SE
E	133	2,676	2,264	-15.4	88.7	1,415	1,380	-2.5	1.9	1.6	SE
E	134 (50%)	2,847	2,701	-5.1	52.9	1,614	1,676	3.8	1.8	1.6	SE
E	135 (95%)	3,346	3,540	5.8	95.3	1,500	1,475	-1.7	2.2	2.4	SE
E	136 (10%)	653	588	-10.0	10.0	317	349	10.1	2.1	1.7	SE
E	137(50%)	3,610	3,287	-8.9	75.0	1,477	1,381	-6.5	2.4	2.4	SE
E	138 (90%)	3,355	2,647	-21.1	78.3	1,462	1,299	-11.1	2.3	2.0	SE
E	139	5,404	4,785	-11.5	140.1	1,964	1,819	-7.4	2.8	2.6	SE
E	140	4,622	3,594	-22.2	105.5	2,407	2,018	-16.2	1.9	1.8	SE
E	141	3,536	2,768	-21.7	141.3	1,447	1,204	-16.8	2.4	2.3	SE
E	142	2,232	2,190	-1.9	196.2	1,236	1,111	-10.1	1.8	2.0	SE
E	144	3,362	3,331	-0.9	154.2	1,434	1,365	-4.8	2.3	2.4	SE
E	145	2,764	2,006	-27.4	80.1	903	743	-17.7	3.1	2.7	SE
E	146	3,086	3,322	7.6	112.7	1,170	1,021	-12.7	2.6	3.3	SE

E	147	3,540	2,437	-31.2	85.5	1,825	1,710	-6.3	1.9	1.4	SE
E	148	1,738	1,278	-26.5	47.2	821	740	-9.9	2.1	1.7	SE
E	149	6,853	5,834	-14.9	110.0	2,717	2,696	-0.8	2.5	2.2	SE
E	151 (75%)	8,059	6,911	-14.2	140.3	2,997	2,947	-1.7	2.7	2.3	SE
E	152	11,241	8,134	-27.6	161.9	3,923	3,484	-11.2	2.9	2.3	SE
E	153	5,308	3,621	-31.8	113.7	2,718	1,950	-28.3	2.0	1.9	SE
E	154	2,150	1,819	-15.4	76.8	221	290	31.2	9.7	6.3	SE
E	155	4,565	3,413	-25.2	104.0	1,571	1,140	-27.4	2.9	3.0	SE
E	156	2,857	2,386	-16.5	106.0	1,060	756	-28.7	2.7	3.2	SE
E	157	2,628	2,764	5.2	122.3	1,254	1,001	-20.2	2.1	2.8	SE
E	162	3,537	2,858	-19.2	86.2	1,188	949	-20.1	3.0	3.0	SE
E	163	4,229	4,147	-1.9	139.6	1,578	1,281	-18.8	2.7	3.2	SE
E	164 (95%)	5,834	5,310	-9.0	112.5	2,032	1,663	-18.2	2.9	3.2	SE
E	165	5,095	3,870	-24.0	99.1	1,926	1,674	-13.1	2.6	2.3	SE
E	166	1,788	1,475	-17.5	63.3	852	715	-16.1	2.1	2.1	SE
E	167	10,391	8,509	-18.1	151.2	4,280	3,726	-12.9	2.4	2.3	SE
E	168	5,903	5,370	-9.0	142.8	2,598	2,238	-13.9	2.3	2.4	SE
E	169 (40%)	5,842	4,911	-15.9	106.6	2,434	2,132	-12.4	2.4	2.3	SE
F	170 (45%)	2,039	1,767	-13.3	176.6	680	662	-2.6	3.0	2.7	SE
F	171 (20%)	1,215	1,055	-13.2	56.6	389	380	-2.3	3.1	2.8	SE
F	172 (30%)	3,395	2,993	-11.8	41.5	1,174	1,130	-3.7	2.9	2.6	SE
F	175 (55%)	5,415	4,955	-8.5	97.2	1,860	1,686	-9.4	2.9	2.9	SE
F	176	10,791	11,464	6.2	243.6	4,104	3,814	-7.1	2.6	3.0	SE
F	195 (40%)	3,360	3,483	3.7	77.5	1,273	1,188	-6.7	2.6	2.9	SE
F	202 (20%)	1,472	1,220	-17.1	37.8	672	546	-18.8	2.2	2.2	SE
F	205 (15%)	492	519	5.5	53.1	210	235	11.9	2.3	2.2	SE
G	143	1,488	1,470	-1.2	136.9	704	703	-0.1	2.1	2.1	SE
G	158	6,786	6,059	-10.7	147.0	2,664	2,568	-3.6	2.5	2.4	SE
G	159	1,926	1,765	-8.4	171.5	860	824	-4.2	2.2	2.1	SE
G	160	8,420	7,973	-5.3	176.4	3,234	3,156	-2.4	2.6	2.5	SE
G	161	6,546	6,034	-7.8	172.0	2,858	2,416	-15.5	2.3	2.5	SE
G	177 (80%)	7,298	6,878	-5.8	141.1	2,997	2,729	-8.9	2.4	2.5	SE
G	178 (25%)	1,720	1,563	-9.1	41.9	752	703	-6.5	2.3	2.2	SE
I	206 (70%)	1,289	1,124	-12.8	222.5	774	770	-0.5	1.7	1.5	SE

I	207 (10%)	664	679	2.3	35.2	309	270	-12.6	2.1	2.5	SE
I	208 (40%)	838	605	-27.8	88.7	506	499	-1.4	1.7	1.2	SE
I	223 (55%)	37	206	456.8	754.8	14	79	464.3	2.6	2.6	SE
I	228 (10%)	157	145	-7.6	17.4	81	20	-75.3	1.9	7.3	SE
I	229 (90%)	222	288	29.7	266.7	79	647	719.0	2.8	0.4	SE
I	230	384	434	13.0	308.4	223	244	9.4	1.7	1.8	SE
I	231	1,347	1,293	-4.0	210.0	566	556	-1.8	2.4	2.3	SE
I	232	690	870	26.1	193.7	316	343	8.5	2.2	2.5	SE
I	233	3,644	3,243	-11.0	147.5	1,512	1,443	-4.6	2.4	2.2	SE
I	234	631	574	-9.0	200.2	221	221	0.0	2.9	2.6	SE
I	235	1,367	1,182	-13.5	196.4	603	498	-17.4	2.3	2.4	SE
I	236	3,016	2,636	-12.6	241.7	1,390	1,362	-2.0	2.2	1.9	SE
I	237 (60%)	3,310	3,209	-3.1	160.4	1,474	1,466	-0.5	2.2	2.2	SE
I	238 (75%)	3,706	3,487	-5.9	146.2	1,876	1,847	-1.5	2.0	1.9	SE
I	239	1,913	1,702	-11.0	121.1	1,369	1,345	-1.8	1.4	1.3	SE
I	240 (70%)	2,852	2,935	2.9	107.1	1,577	1,623	2.9	1.8	1.8	SE
I	241 (25%)	366	374	2.2	25.3	211	182	-13.7	1.7	2.1	SE
I	255 (5%)	153	145	-5.2	9.6	61	66	8.2	2.5	2.2	SE
I	256 (80%)	2,457	2,377	-3.3	171.8	954	1,008	5.7	2.6	2.4	SE
I	257	3,691	3,448	-6.6	183.4	1,921	1,909	-0.6	1.9	1.8	SE
J	258 (45%)	948	827	-12.8	64.9	342	350	2.3	2.8	2.4	SE
J	259 (35%)	2,052	1,929	-6.0	47.3	778	750	-3.6	2.6	2.6	SE
Subtotal:		**373,021**	**338,873**	**-9.2**	**15,202.6**	**163,589**	**158,023**	**-3.4**	**2.3**	**2.1**	
A	3	2,160	2,427	12.4	139.1	1,388	1,638	18.0	1.6	1.5	SW
A	4 (65%)	2,946	2,084	-29.3	84.0	2,187	1,772	-19.0	1.3	1.2	SW
A	7 (50%)	1,224	1,534	25.3	31.0	955	1,167	22.2	1.3	1.3	SW
A	8 (50%)	4,055	3,818	-5.8	49.5	3,083	3,205	4.0	1.3	1.2	SW
A	12 (55%)	4,575	4,649	1.6	87.2	2,984	3,184	6.7	1.5	1.5	SW
B	13	5,152	4,520	-12.3	177.7	2,701	2,363	-12.5	1.9	1.9	SW
B	14 (70%)	2,428	2,634	8.5	55.5	1,569	1,504	-4.1	1.5	1.8	SW
B	19 (65%)	2,462	1,572	-36.1	53.0	1,415	835	-41.0	1.7	1.9	SW
B	20	2,681	2,516	-6.2	71.9	1,265	1,105	-12.6	2.1	2.3	SW

B	21 (20%)	563	527	-6.4	11.8	271	241	-11.1	2.1	2.2	SW
B	22 (10%)	226	219	-3.1	5.9	114	110	-3.5	2.0	2.0	SW
B	30 (60%)	4,854	5,018	3.4	70.6	2,066	2,042	-1.2	2.3	2.5	SW
B	31	6,422	5,902	-8.1	97.6	3,007	2,712	-9.8	2.1	2.2	SW
B	32	6,926	6,147	-11.2	122.3	2,672	2,403	-10.1	2.6	2.6	SW
B	33	7,271	6,128	-15.7	185.6	2,770	2,521	-9.0	2.6	2.4	SW
B	34	557	466	-16.3	146.5	246	200	-18.7	2.3	2.3	SW
B	35	123	95	-22.8	406.7	67	58	-13.4	1.8	1.6	SW
B	36	7,813	7,429	-4.9	220.4	3,248	3,057	-5.9	2.4	2.4	SW
B	37	11,021	10,373	-5.9	151.7	4,218	4,253	0.8	2.6	2.4	SW
B	38.99	4,640	4,092	-11.8	171.7	1,753	1,707	-2.6	2.6	2.4	SW
B	39 (95%)	12,897	11,260	-12.7	211.0	5,147	5,166	0.4	2.5	2.2	SW
B	46	3,072	2,391	-22.2	923.4	1,014	799	-21.2	3.0	3.0	SW
B	47.98	4,663	4,370	-6.3	205.6	1,473	1,458	-1.0	3.2	3.0	SW
B	50 (40%)	1,208	892	-26.2	444.0	209	186	-11.0	5.8	4.8	SW
B	50.99(40%)	341	915	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SW
B	51	592	1,165	96.8	596.3	397	555	39.8	1.5	2.1	SW
C	52	31	53	71.0	2,140.7	13	24	84.6	2.4	2.2	SW
C	54	935	1,271	35.9	436.6	598	707	18.2	1.6	1.8	SW
C	55	6,274	6,293	0.3	296.5	2,384	2,565	7.6	2.6	2.5	SW
C	56	1,259	1,217	-3.3	207.6	572	553	-3.3	2.2	2.2	SW
C	57	81	3	-96.3	318.5	32	4	-87.5	2.5	0.8	SW
C	58	0	32	100.0	838.9	0	37	100.0	0.0	0.9	SW
C	59	0	0	0.0	96.4	0	0	0.0	0.0	0.0	SW
C	60	6,848	6,554	-4.3	268.6	2,660	2,768	4.1	2.6	2.4	SW
C	61	3,548	3,146	-11.3	132.0	1,220	1,193	-2.2	2.9	2.6	SW
C	62	4,292	4,038	-5.9	124.8	1,608	1,581	-1.7	2.7	2.6	SW
C	63	4,468	4,709	5.4	137.1	1,847	1,775	-3.9	2.4	2.7	SW
C	64	4,861	4,512	-7.2	163.8	1,737	1,680	-3.3	2.8	2.7	SW
C	65	6,716	6,283	-6.4	286.4	2,433	2,295	-5.7	2.8	2.7	SW
C	66	4,253	4,218	-0.8	162.1	1,605	1,574	-1.9	2.6	2.7	SW
C	67	7,118	6,431	-9.7	248.3	2,808	2,743	-2.3	2.5	2.3	SW
C	68	0	0	0.0	225.4	0	0	0.0	0.0	0.0	SW
C	69	2,974	2,520	-15.3	150.2	1,130	1,092	-3.4	2.6	2.3	SW

C	70	5,633	5,374	-4.6	115.9	2,005	1,924	-4.0	2.8	2.8	SW
C	71	10,371	9,952	-4.0	165.6	3,495	3,317	-5.1	3.0	3.0	SW
C	72	6,476	6,112	-5.6	120.8	2,244	2,093	-6.7	2.9	2.9	SW
C	73	4,227	3,722	-11.9	96.6	1,478	1,355	-8.3	2.9	2.7	SW
C	74	5,963	5,445	-8.7	167.0	2,287	2,153	-5.9	2.6	2.5	SW
C	75	0	0	0.0	123.1	0	0	0.0	0.0	0.0	SW
D	76	1,774	416	-76.6	248.3	2	0	-100.0	887.0	0.0	SW
D	77	1,898	2,253	18.7	80.3	1,023	931	-9.0	1.9	2.4	SW
D	78	5,319	4,776	-10.2	107.2	2,870	2,448	-14.7	1.9	2.0	SW
D	79	5,147	4,729	-8.1	93.2	2,398	2,427	1.2	2.1	1.9	SW
D	80	5,508	5,031	-8.7	105.8	2,118	1,934	-8.7	2.6	2.6	SW
D	81	10,325	9,314	-9.8	152.0	3,459	3,334	-3.6	3.0	2.8	SW
D	82	9,140	8,020	-12.3	206.1	3,067	2,962	-3.4	3.0	2.7	SW
D	83	11,136	10,336	-7.2	232.8	4,303	4,433	3.0	2.6	2.3	SW
D	84	5,624	5,286	-6.0	122.8	2,165	2,080	-3.9	2.6	2.5	SW
D	85	8,170	7,761	-5.0	154.2	3,632	3,332	-8.3	2.2	2.3	SW
D	86	6,559	6,685	1.9	154.9	3,476	3,186	-8.3	1.9	2.1	SW
D	87	7,210	7,249	0.5	133.2	4,087	4,273	4.6	1.8	1.7	SW
D	88	8,440	9,190	8.9	140.6	2,296	2,600	13.2	3.7	3.5	SW
D	89	2,246	2,786	24.0	216.0	366	702	91.8	6.1	4.0	SW
D	90	3,805	4,473	17.6	110.2	1,396	1,774	27.1	2.7	2.5	SW
D	91	2,722	2,968	9.0	103.5	1,769	1,935	9.4	1.5	1.5	SW
D	92	3,440	3,197	-7.1	127.3	1,640	1,458	-11.1	2.1	2.2	SW
D	93	5,286	4,922	-6.9	99.6	2,453	2,436	-0.7	2.2	2.0	SW
D	94	4,235	4,226	-0.2	92.2	1,754	1,929	10.0	2.4	2.2	SW
D	95	4,214	3,877	-8.0	80.1	1,826	1,743	-4.5	2.3	2.2	SW
D	96	5,230	4,915	-6.0	101.3	2,198	2,111	-4.0	2.4	2.3	SW
D	97	42	89	111.9	527.1	19	46	142.1	2.2	1.9	SW
D	98	7,677	7,271	-5.3	223.4	3,241	3,269	0.9	2.4	2.2	SW
D	99	380	366	-3.7	50.9	134	139	3.7	2.8	2.6	SW
D	100	4,455	3,882	-12.9	136.6	1,747	1,686	-3.5	2.6	2.3	SW
D	101	6,867	6,389	-7.0	149.0	2,778	2,659	-4.3	2.5	2.4	SW
D	102	3,256	3,231	-0.8	88.5	1,514	1,433	-5.4	2.2	2.3	SW
D	103	3,168	2,933	-7.4	71.2	1,382	1,239	-10.3	2.3	2.4	SW

D	104	4,421	4,251	-3.8	116.6	1,601	1,606	0.3	2.8	2.6	SW
D	105	5,297	4,535	-14.4	165.1	2,015	1,796	-10.9	2.6	2.5	SW
D	106	2,132	1,622	-23.9	64.0	1,071	950	-11.3	2.0	1.7	SW
D	107	4,718	4,166	-11.7	114.4	2,186	1,857	-15.1	2.2	2.2	SW
D	108	5,969	4,727	-20.8	132.7	2,601	1,925	-26.0	2.3	2.5	SW
D	109	3,143	2,503	-20.4	63.8	1,289	1,157	-10.2	2.4	2.2	SW
D	110	4,767	4,591	-3.7	119.8	2,366	2,162	-8.6	2.0	2.1	SW
D	111	5,727	5,333	-6.9	325.9	2,390	2,321	-2.9	2.4	2.3	SW
D	112	6,672	6,547	-1.9	125.0	2,663	2,542	-4.5	2.5	2.6	SW
D	113	3,802	3,545	-6.8	85.3	1,545	1,413	-8.5	2.5	2.5	SW
D	114	7,537	7,232	-4.0	240.7	2,999	3,029	1.0	2.5	2.4	SW
D	115	4,364	3,776	-13.5	88.5	1,717	1,682	-2.0	2.5	2.2	SW
D	116	3,433	2,997	-12.7	185.1	1,491	1,442	-3.3	2.3	2.1	SW
D	117	1,942	2,088	7.5	164.1	420	404	-3.8	4.6	5.2	SW
D	118	7,529	7,059	-6.2	232.3	2,388	2,330	-2.4	3.2	3.0	SW
D	119	6,183	6,302	1.9	172.5	2,532	2,488	-1.7	2.4	2.5	SW
D	120	1,747	1,781	1.9	148.0	838	783	-6.6	2.1	2.3	SW
D	121	2,989	3,007	0.6	221.2	1,262	1,283	1.7	2.4	2.3	SW
D	122	7,249	6,955	-4.1	353.4	4,713	5,219	10.7	1.5	1.3	SW
D	123	85	117	37.6	1,362.5	26	52	100.0	3.3	2.3	SW
D	124	0	8	100.0	298.7	0	0	0.0	0.0	0.0	SW
E	125 (60%)	2,035	2,167	6.5	124.4	1,436	1,815	26.4	1.4	1.2	SW
E	134 (50%)	2,847	2,700	-5.2	52.9	1,613	1,676	3.9	1.8	1.6	SW
E	135 (5%)	176	186	5.7	5.0	79	78	-1.3	2.2	2.4	SW
E	136 (90%)	5,879	5,294	-10.0	89.8	2,855	3,144	10.1	2.1	1.7	SW
E	137 (50%)	3,610	3,286	-9.0	75.0	1,476	1,381	-6.4	2.4	2.4	SW
E	138 (10%)	373	294	-21.2	8.7	162	144	-11.1	2.3	2.0	SW
E	150	10	97	870.0	588.8	4	41	925.0	2.5	2.4	SW
E	151 (25%)	2,686	2,304	-14.2	46.8	999	982	-1.7	2.7	2.3	SW
E	169 (60%)	8,762	7,367	-15.9	160.0	3,652	3,198	-12.4	2.4	2.3	SW
F	170 (55%)	2,493	2,160	-13.4	215.8	832	809	-2.8	3.0	2.7	SW
F	171 (75%)	4,557	3,957	-13.2	212.3	1,458	1,425	-2.3	3.1	2.8	SW
F	172 (70%)	7,921	6,983	-11.8	96.9	2,740	2,636	-3.8	2.9	2.6	SW
F	202 (10%)	736	611	-17.0	18.8	335	273	-18.5	2.2	2.2	SW

Philadelphia Land Use

Planning Area A

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant		
46	4A-2	45	270	25	90	20		
47	3A-4	75	5		10	10		
60	4B-1	160	200		360	80		
61	3B-3	110	20	5	45			
Measured Total		**390**	**495**	**30**	**505**	**110**	=	**1530**
Adjusted Total		**406**	**516**	**31**	**526**	**115**	=	**1594**

Planning Area B

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant		
32	3A-3	25	15	90	5	15		
33	3A-1	10		25	250	15		
34	2A-3			60		10		
47	3A-4	370	115	75	115	75		
48	3A-2	600	100	50	200	50		
49	2A-4	300	100	270	300	30		
50	2A-2			300	600			
51	1A-4				250			
61	3B-3	480	40		185	35		
62	3B-1	550	100	150	150	50		
63	2B-3	250	250	100	280	20		
64	2B-1		150	50	737	50		
65	1B-3				120			
76	3B-2		10		95	10		
77	2B-4		125		125	60		
	2B-4 sub-plan				90	60		
Measured Total		**2585**	**1005**	**1170**	**3502**	**480**	=	**8742**
Adjusted Total		**2570**	**999**	**1163**	**3482**	**477**	=	**8691**

Planning Area C

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant
16	3-4	110	15	10	25	
17	3-2	180	20	20	175	5

18	2-4	310	25	50	70	25		
19	2-2	300			50	150		
20	1-4	35		35	70	530		
21	1-2				390	260		
32	3A-3	155	10	10	65	10		
33	3A-1	340	30	100	120	60		
34	2A-3	210	130	255	85	170		
35	2A-1	30	60	210		300		
36	1A-3				260	730		
37	1A-1		55	30	250	215		
51	1A-4				50	200		
52	1A-2				60			
Measured Total		**1670**	**345**	**720**	**1670**	**2655**	=	**7060**
Adjusted Total		**1661**	**343**	**716**	**1661**	**2641**	=	**7023**

Planning Area D

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant		
4	4-3	290	60		240			
5	4-1	120			280			
12	5-4	140	50		280			
	5-4 sub-plan	30	5		10	5		
13	5-2	460	40		350	20		
14	4-4	650	150		180	30		
15	4-2	510	180		150	90		
16	3-4	510	120		150			
27	6A-1				25			
28	5A-3	130	30		370			
29	5A-1				450			
30	4A-3	350	40		470	10		
31	4A-1	400	200		250	150		
32	3A-3	250	30	30	220	100		
45	4A-4	20			30			
46	4A-2	50	20		245	35		
47	3A-4		5		95			
Measured Total		**3910**	**930**	**30**	**3795**	**440**	=	**9105**
Adjusted Total		**3817**	**908**	**29**	**3705**	**430**	=	**8888**

Planning Area E

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant
28	5A-3	60			115	5

29	5A-1	25			425			
30	4A-3				90			
43	5A-4	260	40	20	60	20		
44	5A-2	650	100		150	100		
45	4A-4	315	135	90	270	90		
46	4A-2	20	10		50	20		
57	5B-3	215	35	15	35	50		
58	5B-1	320	40	40	240	160		
59	4B-3	300	90	85	205	120		
60	4B-1	35	10		35	20		
75	4B-4		2		13			
Measured Total		**2200**	**462**	**250**	**1688**	**585**	=	**5185**
Adjusted Total		**2166**	**455**	**246**	**1662**	**576**	=	**5104**

Planning Area F

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant		
27	6A-1	9		34	55	1		
28	5A-3	30	10	20	115	5		
41	6A-4	75	20	15	30	10		
42	6A-2	405	90	135	180	90		
43	5A-4	270	60	60	195	15		
55	6B-3	110	75	45	210	10		
56	6B-1	460	145	100	235	10		
57	5B-3	360	55	55	65	15		
71	6B-4	8	6					
Measured Total		**1727**	**461**	**464**	**1085**	**156**	=	**3893**
Adjusted Total		**1698**	**453**	**456**	**1067**	**153**	=	**3827**

Planning Area G

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant
56	6B-1	6	14	20	10	
57	5B-3	70	10	10	5	5
58	5B-1	140	10	10	25	15
59	4B-3	30	10	5	5	10
71	6B-4	135	60	30	65	10
72	6B-2	400	40	400	100	40
73	5B-4	550	150	150	105	45
74	5B-2	270	80	40	340	50
75	4B-4	20	10	5	40	10
	4B-4 sub-plan		63		2	

85	6C-3			6	6	18		
86	6C-1	280	120	120	110	170		
87	5C-3	75	110	150	225	190		
	5C-3 sub-plan			7				
Measured Total		**1976**	**677**	**953**	**1038**	**563**	=	**5207**
Adjusted Total		**1909**	**654**	**921**	**1003**	**544**	=	**5030**

Planning Area H

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant		
1	8-1	80	35		50	225		
2	7-3	445	70		190	335		
3	7-1	245			105	280		
7	8-2					85		
8	7-4	110			35	75		
9	7-2	375	25		75	25		
10	6-4	630	45	45	55	125		
11	6-2		25	20	15	75		
	6-2 sub-plan	115	20	20	10	10		
26	6A-3	85	5			10		
27	6A-1	50	5	10	10	5		
Measured Total		**2135**	**230**	**95**	**545**	**1250**	=	**4255**
Adjusted Total		**2008**	**216**	**89**	**513**	**1176**	=	**4002**

Planning Area I

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant
1	8-1				17	9
	8-1 sub-plan				49	5
6	8-4	200	8	1	96	57
7	8-2	547	40		302	26
8	7-4	311	2		461	25
9	7-2	112			336	32
10	6-4				24	
23	8A-1	403	25		66	5
24	7A-3	698	52	3	216	31
25	7A-1	738	35		207	20
26	6A-3	285	32		558	25
27	6A-1	361	23	3	258	26
39	7A-4	224	19	1	131	17
40	7A-2	244	46	28	109	26
41	6A-4	360	30	30	150	30

42	6A-2	10	25	5	30	30		
Measured Total		**4493**	**337**	**71**	**3010**	**364**	=	**8275**
Adjusted Total		**4543**	**341**	**72**	**3043**	**368**	=	**8367**

Planning Area J

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant		
22	8-3	150	20		40			
	8-3 sub-plan	20	5		20			
23	8A-1	265	30		130	5		
38	8A-2	480	120		195	5		
39	7A-4	420	60	30	70	20		
40	7A-2	230	20		185	15		
41	6A-4	115	15	50	60	10		
53	7B-3	530	130		225			
54	7B-1	500	125	100	200	75		
55	6B-3	355	55	30	80	30		
68	8B-2 sub-plan	81	10		10	5		
69	7B-4				10			
70	7B-2	36			39			
71	6B-4	130	10	10	80			
Measured Total		**3182**	**600**	**220**	**1344**	**165**	=	**5511**
Adjusted Total		**3224**	**608**	**223**	**1362**	**167**	=	**5584**

Planning Area K

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant
66	9B-2	100			50	10
67	8B-4	275	25	25	150	25
68	8B-2	325	50	25	50	50
69	7B-4	495	180	45	140	40
70	7B-2	420	185	90	225	5
71	6B-4	160	45	45	195	5
72	6B-2	2	6	8	4	
80	9C-1	125			125	
81	8C-3	520	90	45	180	45
82	8C-1	650	150		150	50
83	7C-3	700	150		100	50
84	7C-1	700	50		240	10
85	6C-3	430	100	195	150	95
86	6C-1	70	20	70	20	20
93	8C-4	50	10		40	

94	8C-2	260	20		80	40		
95	7C-4	570	95	95	140	50		
96	7C-2	350	90	180	230	30		
97	6C-4	40	85	25	50	75		
	6C-4 sub-plan		25	5	65	5		
105	7D-3				15	20		
Measured Total		**6242**	**1376**	**853**	**2399**	**625**	=	**11495**
Adjusted Total		**6164**	**1359**	**842**	**2369**	**617**	=	**11352**

Planning Area L

Page #	Plan #	Residential	Commercial	Industrial	Institutional	Vacant		
66	9B-2				40			
78	10C-1	200		225	25	50		
	10C-1 sub-plan	65	5	10				
79	9C-3	660			90	130		
80	9C-1	225	75		450			
81	8C-3				100			
88	11C-2	375	25		75	25		
89	10C-4	625	45		245	45		
90	10C-2	500	100	100	100	200		
91	9C-4	400	100	150	300	50		
92	9C-2	350	150	100	370	30		
93	8C-4	495		135	225	45		
94	8C-2	210			390			
95	7C-4		10		30	10		
98	11D-1	105			45	25		
99	10D-3	100	100	145	135	385		
100	10D-1	300	200	50	300	150		
101	9D-3	150	50	50	640	110		
102	9D-1	350	50		410	190		
103	8D-3	450	50		450	50		
104	8D-1	295	150	100	345	100		
105	7D-3	85		115	330	50		
106	10D-4	45	45		60	150		
107	10D-2	250	80		170	50		
108	9D-4	210	180		120	90		
109		150	10		20	20		
110	8D-4	50	15		30	55		
	8D-4 sub-plan	90			5	5		
Measured Total		**6735**	**1440**	**1180**	**5500**	**2015**	=	**16870**
Adjusted Total		**6795**	**1453**	**1191**	**5549**	**2033**	=	**17021**

lutp.xls

Philadephia Act 537
Land Use in the Treatment Plant Service Areas

lutp.xls

Philadephia Act 537
Land Use in the Treatment Plant Service Areas

Northeast WWTP

Planning Analysis Section	Total Acreage	Residential	Commercial	Industrial	Institutional	Vacant
E	6	2	2	0	2	1
F	2,500	1,109	296	298	697	100
G	4,043	1,534	526	740	806	437
I	2,566	1,393	105	22	933	113
J	5,472	3,159	596	219	1,335	164
K	11,353	6,165	1,359	842	2,369	617
L	17,021	6,795	1,453	1,191	5,549	2,033
Total	**42,960**	**20,157**	**4,336**	**3,312**	**11,691**	**3,464**
		46.9%	**10.1%**	**7.7%**	**27.2%**	**8.1%**

Southeast WWTP

Planning Analysis Section	Total Acreage	Residential	Commercial	Industrial	Institutional	Vacant
A	1,203	307	390	23	397	87
B	4,362	1,290	501	584	1,747	239
E	3,947	1,675	352	190	1,285	445
F	784	348	93	93	219	31
G	987	375	128	181	197	107
I	3,808	2,068	155	33	1,385	167
J	112	65	12	4	27	3
Total	**15,203**	**6,126**	**1,631**	**1,109**	**5,257**	**1,081**
		40.3%	**10.7%**	**7.3%**	**34.6%**	**7.1%**

Philadephia Act 537
Land Use in the Treatment Plant Service Areas

Southwest WWTP

Planning Analysis Section	Total Acreage	Residential	Commercial	Industrial	Institutional	Vacant
A	391	100	127	8	129	28
B	4,329	1,280	498	579	1,734	238
C	7,023	1,661	343	716	1,661	2,641
D	8,888	3,817	908	29	3,705	430
E	1,151	489	103	55	375	130
F	544	241	64	65	152	22
H	4,002	2,008	216	89	513	1,176
I	1,994	1,083	81	17	725	88
Total	**28,322**	**10,678**	**2,339**	**1,558**	**8,994**	**4,752**
		37.7%	**8.3%**	**5.5%**	**31.8%**	**16.8%**

Area and Density of Philadelphia Census Tracts - 1990

Source of Data

These tables are derived from the Census Bureau's 1990 Public Law 94-171 file which provides data for legislative redistricting purposes. In addition to population data, the file includes measurements of land and water area which originate in the Census Bureau's automated mapping file known as TIGER. This file contains digitized boundary data for the Bureau's maps.

Definitions

Acres Land
: The total land area including any intermittent water. Measurements may be converted to square miles by dividing acres by 640.

Acres Water
: Total water area including lakes, reservoirs, ponds, rivers and streams.

Persons per Acre
: Total population in 1990 divided by land area. This is blank for census tracts with less than 200 persons.

Summary

The total land area of the City of Philadelphia is 135.1 square miles (86,483 acres). There is an additional 7.5 square miles of water area (4,829 acres). The average population density for the city, as a whole, is 11,712 persons per square mile, or 18.3 persons per acre.

Area, Population and Density by Planning Analysis Section - 1990

P.A.S.	Acres Land	Acres Water	Popu-lation	Persons /Acre	Persons /Sq.Mile
A	1,594.3	351.4	45,645	28.6	18,323
B	8,690.9	1,415.7	170,944	19.7	12,588
C	7,022.9	725.0	81,885	11.7	7,462
D	8,887.6	197.2	219,713	24.7	15,822
E	5,103.9	275.3	146,491	28.7	18,369
F	3,827.4	17.5	106,045	27.7	17,732
G	5,029.8	750.5	94,715	18.8	12,052
H	4,001.9	94.1	45,525	11.4	7,281
I	8,367.2	41.5	103,266	12.3	7,899
J	5,583.8	6.2	176,550	31.6	20,236
K	11,352.2	456.4	237,251	20.9	13,375
L	17,021.3	498.4	160,547	9.4	6,037
City	86,483.3	4,829.2	1,588,577	18.3	11,712

SECTION H IS INCORRECT
42,525

AREA AND POPULATION BY CENSUS TRACT - 1990

TRACT	ACRES LAND	ACRES WATER	PERSONS /ACRE
1.00	175.2	0.0	11.8
2.00	100.6	0.0	14.0
3.00	139.1	0.5	17.4
4.00	129.2	3.7	24.8
5.00	106.5	0.0	9.9
6.00	42.3	0.0	8.3
7.00	62.0	1.7	49.5
8.00	99.1	3.0	77.1
9.00	64.7	0.0	65.4
10.00	174.2	0.0	32.8
11.00	91.9	0.0	60.9
12.00	158.6	6.9	53.3
13.00	177.7	12.8	25.4
14.00	79.3	0.0	47.4
15.00	58.6	0.0	43.3
16.00	49.4	0.0	39.3
17.00	50.7	0.0	49.2
18.00	59.3	0.0	54.8
19.00	81.5	0.0	29.7
20.00	71.9	0.0	35.0
21.00	58.8	0.0	44.8
22.00	59.1	0.0	37.2
23.00	52.6	0.0	48.0
24.00	132.0	0.0	32.7
25.00	98.6	0.0	34.8
26.00	113.7	81.1	.
27.00	146.5	0.0	50.3
28.00	146.0	0.0	61.4
29.00	89.7	0.0	44.8
30.00	117.6	0.0	71.1
31.00	97.6	0.0	60.5
32.00	122.3	0.0	50.3
33.00	185.6	7.9	33.0
34.00	146.5	12.4	3.2
35.00	406.7	52.4	.
36.00	220.4	0.0	33.7
37.00	151.7	0.0	68.4
38.98	171.7	0.0	23.8
39.00	222.1	0.0	53.4
40.00	160.1	0.0	59.0
41.00	191.8	0.0	69.5
42.00	198.4	0.0	55.8
43.00	466.5	198.4	.
44.00	142.6	0.0	7.6
45.00	123.3	0.0	26.4
46.00	923.4	68.7	2.6
47.98	205.6	0.0	21.3
48.00	112.2	0.0	4.7
49.00	1,092.9	115.9	.
50.00	1,110.0	792.0	2.0
50.99	0.0	0.0	.
51	596.3	74.1	2.0
52	2,140.7	456.9	.
54	436.6	131.5	2.9
55	296.5	0.0	21.2
56	207.6	0.0	5.9
57	318.5	0.0	.
58	838.9	55.6	.
59	96.4	0.0	.
60	268.6	0.0	24.4
61	132.0	0.0	23.8
62	124.8	0.0	32.4
63	137.1	0.0	34.3
64	183.8	0.0	27.5
65	286.4	0.0	21.9
66	162.1	0.0	26.0
67	248.3	0.0	25.9
68	225.4	26.2	.
69	150.2	19.5	16.8
70	115.9	0.0	46.4
71	165.6	0.0	80.1
72	120.8	0.0	50.6
73	96.6	0.0	38.5
74	167.0	0.0	32.6
75	123.1	35.3	.
76	248.3	35.3	1.7
77	80.3	0.0	28.1
78	107.2	0.0	44.5
79	93.2	0.0	50.8
80	105.8	0.0	47.8
81	152.0	0.0	61.3
82	206.1	0.0	38.9
83	232.8	0.0	44.4
84	122.8	0.0	43.0
85	154.2	0.0	50.3
86	154.9	0.0	43.1
87	133.2	0.0	54.4
88	140.6	0.0	65.4
89	216.0	12.4	12.9
90	110.2	0.0	40.6
91	103.5	0.0	28.7
92	127.3	0.0	25.1
93	99.6	0.0	49.4
94	92.2	0.0	45.9
95	80.1	0.0	48.4
96	101.3	0.0	48.5
97	527.1	0.0	.
98	223.4	0.0	32.5
99	50.9	0.0	7.2
100	136.6	0.0	28.4
101	149.0	0.0	42.9
102	88.5	0.0	36.5
103	71.2	0.0	41.2
104	116.6	0.0	36.4
105	165.1	0.0	27.5
106	64.0	0.0	25.3
107	114.4	0.0	36.4
108	132.7	0.0	35.8
109	83.8	0.0	39.3
110	119.8	0.0	38.3
111	325.9	0.0	18.4
112	125.0	0.0	52.4
113	85.3	0.0	41.6
114	240.7	0.0	30.0
115	88.5	0.0	42.7
116	185.1	0.0	16.2
117	164.1	0.0	12.7
118	232.3	0.0	30.4
119	172.5	0.0	36.5
120	148.0	0.0	12.0
121	221.2	0.0	13.8
122	353.4	12.1	19.7
123	1,362.5	102.1	.
124	298.7	35.3	.
125	207.3	13.3	17.4
126	90.7	0.0	7.0
127	83.3	0.0	4.8
128	63.5	0.0	.
129	89.5	0.0	4.8
130	51.4	0.0	19.6
131	79.1	0.0	27.8
132	107.0	0.0	38.9
133	88.7	0.0	25.5
134	105.8	0.0	51.1
135	100.3	0.0	37.1
136	99.8	0.0	58.9
137	150.0	0.0	43.8
138	87.0	0.0	33.8
139	140.1	0.0	34.2
140	105.5	0.0	34.1
141	141.3	0.0	19.6
142	196.2	81.5	11.2
143	136.9	67.2	10.7
144	154.2	0.0	21.6
145	80.1	0.0	25.1
146	112.7	0.0	29.5
147	85.5	0.0	28.5
148	47.2	0.0	27.1
149	110.0	0.0	53.1
150	588.8	200.4	.
151	187.1	0.0	49.3
152	161.9	0.0	50.3
153	113.7	0.0	31.9
154	76.8	0.0	23.7
155	104.0	0.0	32.8
156	106.0	0.0	22.5
157	122.3	0.0	22.6
158	147.0	0.0	41.2
159	171.5	0.0	10.3
160	176.4	0.0	45.2
161	172.0	0.0	35.1
162	86.2	0.0	33.1
163	139.6	0.0	29.7
164	118.4	0.0	47.2
165	99.1	0.0	39.1
166	63.3	0.0	23.3
167	151.2	0.0	56.3
168	142.8	0.0	37.6
169	266.6	0.0	46.0
170	392.4	12.6	10.0
171	282.9	0.0	18.6
172	138.4	0.0	72.1
173	217.0	0.0	17.6
174	86.0	0.0	39.6
175	176.7	1.7	51.0
176	243.6	0.0	47.1
177	176.4	0.0	48.7
178	167.5	0.0	37.3
179	167.8	0.0	38.4
180	201.1	0.0	41.9
181	170.7	0.0	.
182	581.7	424.5	0.6
183	520.6	97.4	6.1
184	282.4	161.4	8.2
185	163.6	0.0	.
186	176.2	0.0	27.4
187	198.9	0.0	8.9
188	166.3	0.0	43.1
189	252.5	0.0	4.0
190	196.9	0.0	32.6
191	359.5	0.0	16.9
192	162.8	0.0	43.5
193	280.7	0.0	.
194	332.6	0.0	1.1
195	193.7	0.0	44.9
196	185.3	0.0	14.2
197	210.8	3.2	36.7
198	133.4	0.0	52.2
199	164.6	0.0	32.6
200	79.6	0.0	27.3
201	215.7	0.0	37.3
202	188.8	0.0	32.3
203	130.0	0.0	29.1
204	101.8	0.0	37.4

Research Unit - City Planning Commission

AREA AND POPULATION BY CENSUS TRACT - 1990

TRACT	ACRES LAND	ACRES WATER	PERSONS /ACRE
205	354.1	0.0	9.8
206	317.8	19.3	5.1
207	352.4	21.5	19.3
208	221.7	0.0	6.8
209	131.5	9.4	23.4
210	210.5	6.4	26.1
211	134.9	0.0	19.3
212	122.3	0.0	20.2
213	134.4	0.0	28.5
214	157.2	6.4	24.6
215	270.1	4.9	13.1
216	432.9	13.6	3.4
217	388.7	0.0	16.4
218	250.8	0.0	16.2
219	382.3	29.4	3.7
220	719.1	23.7	2.2
221	161.9	0.0	7.2
222	505.3	0.0	3.1
223	1,372.4	0.7	0.3
224	160.4	0.0	2.1
225	221.7	0.0	2.3
226	152.5	0.0	3.1
227	141.6	0.0	10.1
228	174.2	0.0	8.3
229	296.3	0.0	1.1
230	308.4	0.0	1.4
231	210.0	0.0	6.2
232	193.7	0.0	4.5
233	147.5	0.0	22.0
234	200.2	0.0	2.9
235	196.4	0.0	6.0
236	241.7	0.0	10.9
237	267.4	0.0	20.0
238	195.0	0.0	23.9
239	121.1	0.0	14.1
240	153.0	0.0	27.4
241	101.3	0.0	14.8
242	132.7	0.0	32.5
243	167.0	0.0	25.7
244	103.8	0.0	35.4
245	199.4	0.0	22.7
246	153.2	0.0	21.6
247	231.8	0.0	24.3
248	80.6	0.0	27.4
249	80.3	0.0	51.6
250	184.1	0.0	5.0
251	132.2	0.0	17.2
252	233.5	0.0	31.6
253	141.3	0.0	30.5
254	191.0	0.0	23.8
255	191.8	0.0	15.1
256	214.7	0.0	13.8
257	183.4	0.0	18.8
258	144.3	0.0	12.7
259	135.2	0.0	40.8
260	133.9	0.0	26.1
261	164.3	0.0	22.1
262	137.1	0.0	37.7
263	272.8	0.0	40.4
264	196.9	0.0	32.7
265	136.4	0.0	39.3
266	222.4	0.0	33.7
267	158.9	0.0	49.3
268	189.5	0.0	24.5
269	154.2	0.0	14.9
270	158.4	0.0	14.4
271	93.2	6.2	26.4
272	162.8	0.0	27.3
273	230.5	0.0	24.0
274	207.6	0.0	46.3
275	152.5	0.0	30.5
276	163.8	0.0	25.9
277	135.7	0.0	39.5
278	180.4	0.0	29.2
279	319.5	0.0	24.7
280	176.7	0.0	29.5
281	125.3	0.0	34.9
282	213.5	0.0	28.2
283	167.8	0.0	52.1
284	117.6	0.0	49.9
285	70.7	0.0	32.0
286	168.8	0.0	42.2
287	87.5	0.0	28.2
288	114.9	0.0	33.5
289	292.1	0.0	29.0
290	198.7	0.0	28.5
291	334.8	0.0	13.3
292	421.1	0.0	9.4
293	172.2	0.0	16.7
294	164.6	0.0	19.5
295	156.9	0.0	6.8
296	58.3	0.0	20.1
297	176.2	41.8	2.6
298	160.4	0.0	26.3
299	147.8	0.0	29.3
300	225.4	0.0	30.5
301	160.4	0.0	31.1
302	220.9	0.0	29.5
303	208.3	0.0	33.3
304	307.4	0.0	2.1
305	264.2	0.0	36.2
306	247.1	0.0	26.4
307	158.6	0.0	16.5
308	195.2	0.0	22.6
309	158.9	0.0	20.6
310	266.4	0.0	21.2
311	185.1	0.0	42.9
312	102.3	0.0	37.7
313	176.2	0.0	30.3
314	260.5	0.0	34.1
315	293.3	0.0	32.0
318	180.9	0.0	30.6
317	217.0	0.0	25.7
318	117.9	0.0	29.3
319	188.8	0.0	25.5
320	171.0	0.0	37.7
321	136.4	0.0	26.6
322	136.4	118.9	.
323	150.2	0.0	23.9
324	166.3	141.1	.
325	207.6	0.0	27.7
326	199.9	0.0	33.7
327	340.8	154.7	0.9
328	662.2	385.0	8.1
329	233.0	0.0	18.1
330	184.1	0.0	40.2
331	294.3	0.0	30.9
332	207.1	0.0	12.5
333	257.2	0.0	15.6
334	291.1	0.0	15.3
335	226.6	0.0	15.0
336	279.5	0.0	22.0
337	504.3	0.0	17.9
338	344.5	0.0	15.9
339	281.7	0.0	10.2
340	187.1	0.0	13.5
341	333.8	0.0	16.7
342	245.1	0.0	13.7
343	1,336.3	0.0	.
344	852.0	0.0	9.1
345	355.6	0.0	22.3
346	453.7	0.0	3.1
347	530.8	0.0	19.9
348	967.7	0.0	15.4
349	483.3	0.0	14.5
351	243.6	113.4	15.6
352	461.8	0.0	9.9
353	757.1	0.0	14.2
354	1,889.9	0.0	.
355	576.0	0.0	12.1
356	850.0	0.0	9.9
357	530.3	0.0	16.3
358	434.7	0.0	14.1
359	558.5	0.0	9.8
360	575.3	0.0	5.3
361	300.0	0.0	13.5
362	904.6	0.0	19.9
363	1,336.8	0.0	11.8
364	1,072.7	0.0	0.5
365	888.3	0.0	10.5
366	250.8	335.6	1.8
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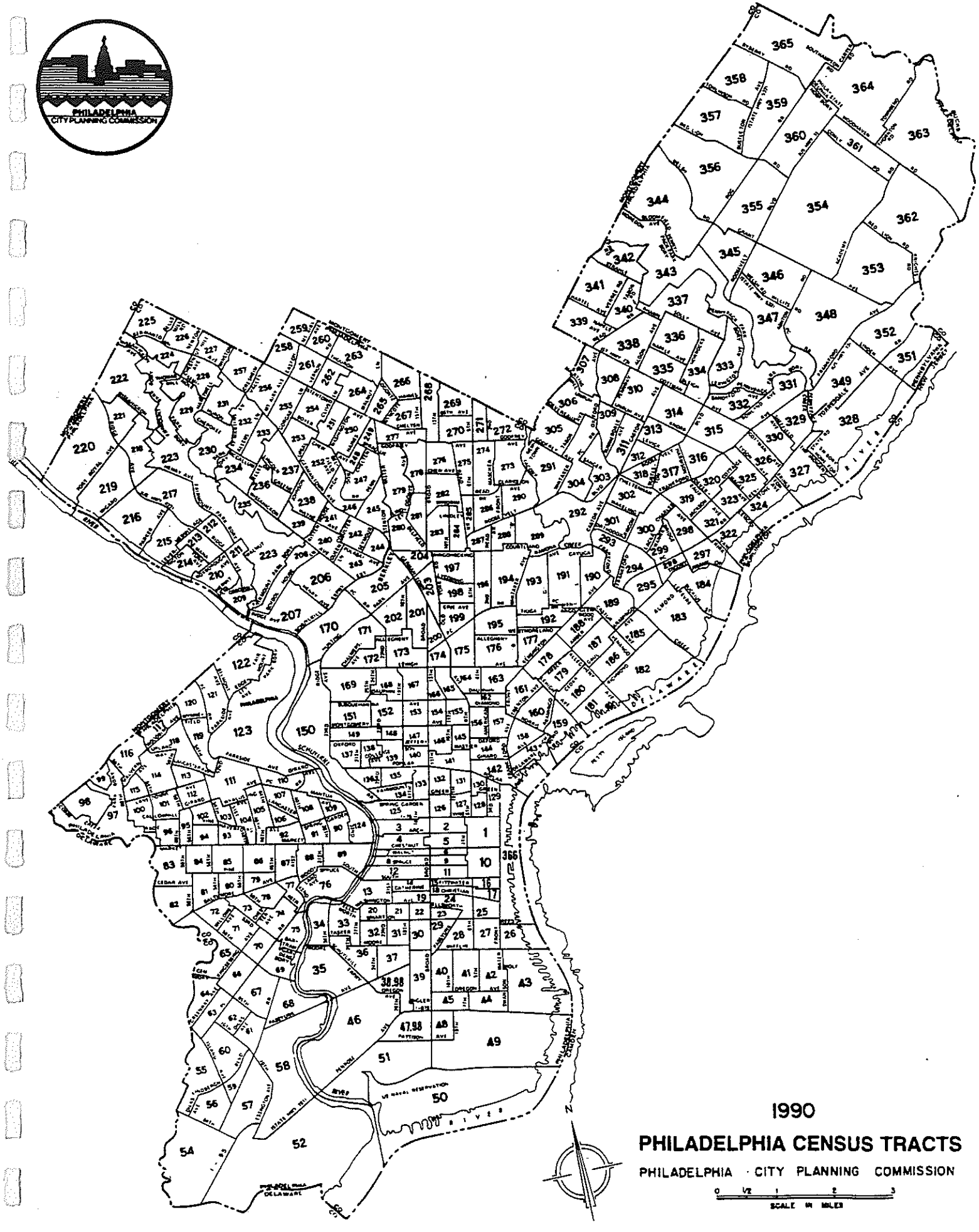
Research Unit - City Planning Commission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CITY PLANNING COMMISSION
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PHILADELPHIA · CITY PLANNING COMMISSION
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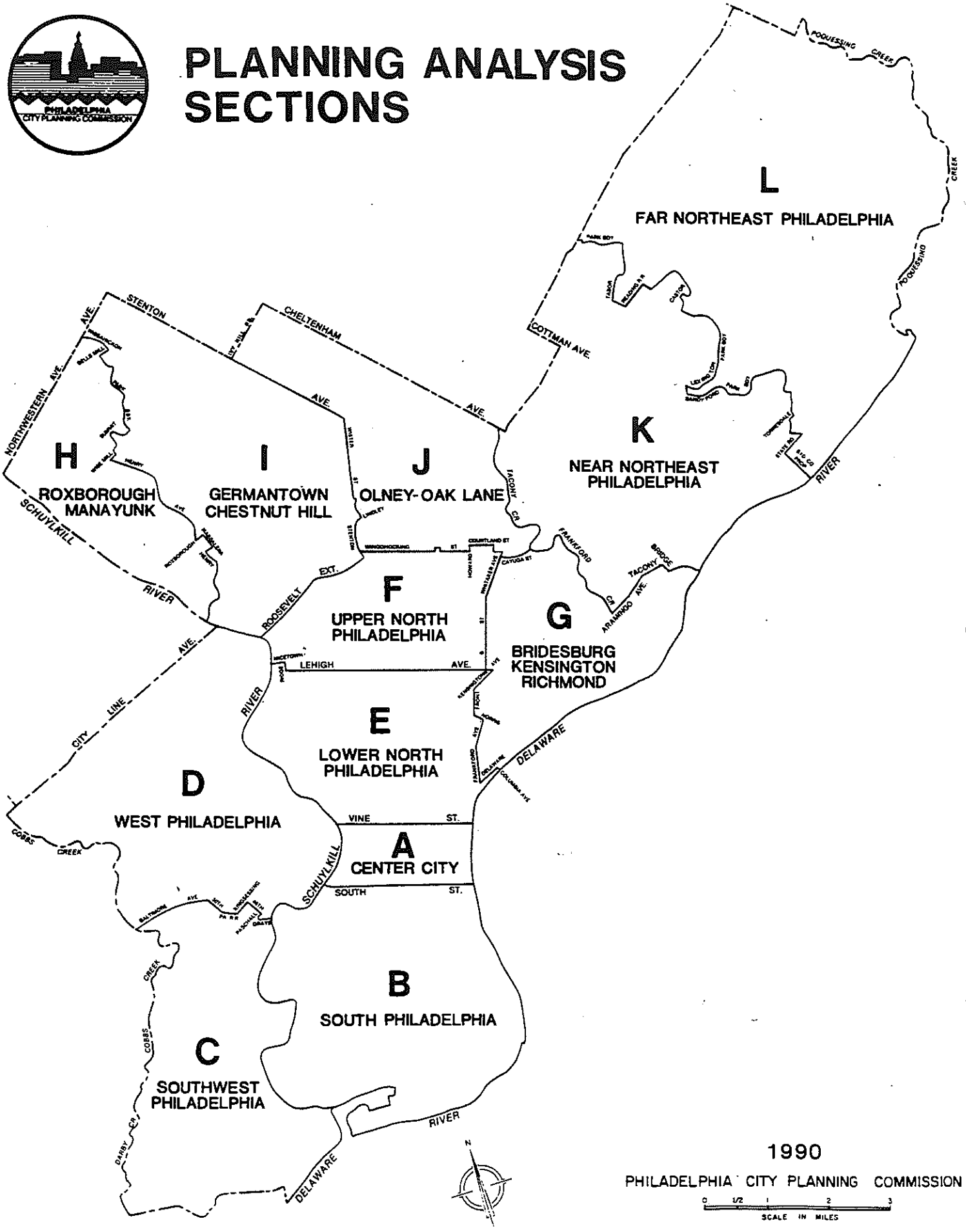
SCALE IN MILES

PLANNING ANALYSIS SECTIONS



APPENDIX E

"Water Only" Accounts, List Of Streets In Each Section, New Septic Permit Listings, Information On Those Properties With On-Lot Malfunctions, And Regulations Pertaining To Septic Systems.

Water Use Only Accounts

WATER DEPARTMENT
WATER ONLY STOMERS

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
001	14180 03613 001	RYAN MARK P & M	03613		AVALON ST	42R
001	57060 61980 D01	RICHARD FLINN	61980		MORRELL+OUTLOOK	42R
001	57060 61980 D02	PACITTI VINCENT & M	61980		MORRELL+OUTLOOK	42R
001	65540 03500 001	GONZALEZ CARLOS JR	03500		PRESIDENT ST	42R
002	63200 00099 D01	CHELTENHAM TOWNSHIP	00099		PASSMORE ST	42R
005	88760 00600 001	EL LAFAYETTE D	00600	N	49TH ST	42R
006	20180 03003 D01	TRUSTEES BYBERRY MONTHLY	03003		BYBERRY RD	42R
006	20160 03120 001	D R HOWELL ETAL	03120		BYBERRY RD	42R
006	20160 03320 D01	BYBERRY BAP CHAPEL CH	03320		BYBERRY RD	42R
006	20160 03344 001	PRW MANAGEMENT & CONSULTG	03344		BYBERRY RD	42R
006	20160 03374 001	RHODES FLORENCE	03374		BYBERRY RD	42R
006	20160 03380 001	STEELE F M & R	03380		BYBERRY RD	42R
008	11200 09559 001	ANN M STAUFENBERG	09559		ACADEMY RD	42R
014	48040 00099 D01	CHELTENHAM TWP COMM	00099		KNORR ST	42R
014	68780 03267 001	WOLFE DONALD	03267		RIVER RD	42R
014	87990 03509 001	L H INDUSTRIES INC	03509	N	10TH ST	42R
015	24480 00099 D01	CHELTENHAM TOWNSHIP	00099		COMLY ST	42R
015	28320 00099 D01	CHELTENHAM TOWNSHIP	00099		DEVEREAUX AVE	42R
017	23640 01901 001	EUGENE SUKONICK ETAL	01901	W	CLEARFIELD ST	42R
024	49680 03503 001	MAXIM MARINE COMP INC	03503	N	LAWRENCE ST	42Z
025	12820 04023 001	ELEANOR P BARLOW	04023		APALOGEN RD	42R
025	12820 04024 001	LAURENCE BROWNE	04024		APALOGEN RD	42Z
025	12820 04029 001	TISHGART PERRY & J	04029		APALOGEN RD	42R
025	12820 04101 001	HALPERN CHARLES	04101		APALOGEN RD	42R
025	12820 04107 001	GREENFIELD MARJORIE	04107		APALOGEN RD	42R
025	12820 04112 001	ROSE MERVES	04112		APALOGEN RD	42R
025	12820 04113 001	TUCKER SAMUEL H	04113		APALOGEN RD	42R
025	12820 04118 001	MELVIN & G CHISUM	04118		APALOGEN RD	42R
025	12820 04119 001	NEWBOLD JOSEPH & VIVIEN	04119		APALOGEN RD	42R
025	12820 04145 001	DE BENEDICTIS NICHOLAS	04145		APALOGEN RD	42R
025	12820 04151 001	WEISENBERG RICHARD	04151		APALOGEN RD	42R
025	12820 04157 001	ADAMS JOHN M	04157		APALOGEN RD	42R
025	22730 04130 001	HENRY W & G S SAWYER 3RD	04130		CHERRY LA	42R
025	34845 03000 001	THAIN JOHN H	03000		FOXX LA	42R
025	34845 03001 001	CADES DANIEL	03001		FOXX LA	42R
025	34845 03002 001	T SAUERMAN ETUX	03002		FOXX LA	42R
025	34845 03003 001	HALL BOBLE & J	03003		FOXX LA	42R
025	34845 03004 001	RINALDI A & C	03004		FOXX LA	42R
025	34845 03005 001	HAND ADELAIDE	03005		FOXX LA	42R
025	34845 03006 001	A & N ADAMS	03006		FOXX LA	42R
025	34845 03009 001	R L BAZELON	03009		FOXX LA	42R
025	34845 03010 001	R POPPER & S	03010		FOXX LA	42R
025	34845 03011 001	LORD JOSEPH III	03011		FOXX LA	42R
025	62000 05038 001	M & M FINKEL	05038		OVERBROOK AVE	42R
025	71280 03031 001	SILVER LOUIS E	03031	W	SCHOOL HOUSE LA	42Z
025	71280 03101 003	PHILA CLLG OF TEX & SCI	03101	W	SCHOOL HOUSE LA	C2Z
025	71280 03201 003	PHILA COLL OF TEX & SCI	03201	W	SCHOOL HOUSE LA	42Z
025	71280 03401 001	HASS SHAFIA ETUX	03401	W	SCHOOL HOUSE LA	42R
025	71280 03407 001	PASQUARIELLO PATRICK	03407	W	SCHOOL HOUSE LA	42R
025	71280 03413 001	E J TAYLOR	03413	W	SCHOOL HOUSE LA	42R
025	71280 03419 001	LA BOCCETTA ALFRED	03419	W	SCHOOL HOUSE LA	42R
025	71280 03425 001	HELEN E FOX	03425	W	SCHOOL HOUSE LA	42R

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PHASE 01 END, NO TERMINAL ERRORS DETECTED
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DAY	ACCOUNT	OWNER	ADDRESS			SERVICE	
025	71280 03437 001	STAFFORD JANIE	03437 W	SCHOOL HOUSE	LA	42R	
025	71280 03443 001	G C NICASTRO & R P	03443 W	SCHOOL HOUSE	LA	42R	
025	71280 03449 001	EDMUND PAWELEC	03449 W	SCHOOL HOUSE	LA	42Z	
025	71280 03455 001	KISH STEPHEN & L	03455 W	SCHOOL HOUSE	LA	42Z	
025	71280 03461 001	W L RAFSKY & S C	03461 W	SCHOOL HOUSE	LA	42R	
025	77340 04024 001	STONE ANTDINETTE	04024	TIMBER	LA	42R	
025	77340 04100 001	DR GEORGE E WOODY	04100	TIMBER	LA	42Z	
025	77340 04133 001	L WALKER JR & M C	04133	TIMBER	LA	42R	
025	77340 04141 001	CHEEK THEODORE G	04141	TIMBER	LA	42R	
026	42140 00530 001	COYNE DORIS F	00530	HERMIT	ST	42R	
026	42140 00562 001	SMITH JOSEPH & EVA	00562	HERMIT	ST	42R	
026	42140 00562 002	SMITH EVA	00562	HERMIT	ST	42R	
026	48000 01007 001	J WALLACE	01007	KITCHENS	LA	42R	
026	48000 01025 001	P C HARBESON & J S	01025	KITCHENS	LA	42R	
026	51220 01001 001	LEVY ROBERT JR	01001	LIVEZEY	ST	42R	
026	51220 01003 001	GLOSSER DAVID D & GUILA	01003	LIVEZEY	ST	42R	
026	51220 01005 001	KELLER JOHN C	01005	LIVEZEY	ST	42R	
026	51220 01040 001	DAVID LEAK ETUX	01040	LIVEZEY	ST	42R	
026	51220 01050 001	WILLIAMS ROBERT JR & J	01050	LIVEZEY	ST	42R	
026	69600 00542 A01	TROPIANO ANNA MAY	00542	ROXBOROUGH	AVE	42R	
026	73840 06513 D01	CATHERS DANIEL & J	06513	SPRINGBANK	ST	42Z	
026	73840 06701 001	WERTHAN ELIZABETH	06701	SPRINGBANK	ST	42R	
026	73840 06703 001	KOTLIKOFF M & MCDANIEL C	06703	SPRINGBANK	ST	42R	
026	73840 06705 001	MARGARET B BOSTWICK	06705	SPRINGBANK	ST	42Z	
026	82620 01006 001	RUSSELL VAN SCIVER	01006	WESTVIEW	AVE	42R	
026	82620 01009 001	P & H DILKS	01009	WESTVIEW	AVE	42Z	
026	82620 01012 001	J & C STOKES JR	01012	WESTVIEW	AVE	42Z	
026	82620 01013 001	MARRAZZO WILLIAM & RANDI	01013	WESTVIEW	AVE	42Z	
026	82620 01020 001	DEAN MICHAEL & S	01020	WESTVIEW	AVE	42R	
026	84060 06540 001	TIDWELL OTTO & DOUGHERTY	06540	WISSAHICKON	AVE	42Z	
026	84060 06640 001	M & R SILVER	06640	WISSAHICKON	AVE	42R	
026	84060 06701 A01	BRUTON D	06701	WISSAHICKON	AVE	42Z	
026	84060 06701 002	GERALD W CORPREW	06701	WISSAHICKON	AVE	42R	
026	84060 06703 001	GRAHAM EDWARD & D	06703	WISSAHICKON	AVE	42R	
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026	84060 06707 001	WRIGHT CHARLES & A	06707	WISSAHICKON	AVE	42Z	
026	84060 06714 001	PRESSMAN ARTHUR & D	06714	WISSAHICKON	AVE	42R	
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026	84060 06723 001	GENERLIS ALEXANDER ETUX	06723	WISSAHICKON	AVE	42R	
026	84060 06825 001	CELENTANO AMY DUPUY*	06825	WISSAHICKON	AVE	42R	
026	84060 06829 001	BDGERT PETER H & C	06829	WISSAHICKON	AVE	42R	
026	84060 06950 001	WILKES REGINALD	06950	WISSAHICKON	AVE	42Z	
026	84060 07030 001	S H PUTMAN ETUX	07030	WISSAHICKON	AVE	42Z	
026	84060 07030 002	S H PUTMAN ETUX	07030	WISSAHICKON	AVE	42R	
026	84060 07125 001	M L & M B DRATMAN	07125	WISSAHICKON	AVE	42Z	
026	84083 00001 001	FORD ISIAH & M	00001	WISSAHICKON	LA	42R	
026	84083 00002 001	CLARKE EUGENE JR	00002	WISSAHICKON	LA	42R	
026	84083 00003 001	BARTON JAMES & SOLOMON G	00003	WISSAHICKON	LA	42R	
026	84083 00004 001	DRAPER G C	00004	WISSAHICKON	LA	42R	
026	84083 00005 001	BALLARD CLIFFORD	00005	WISSAHICKON	LA	42R	
026	84083 00006 001	JACKSON M	00006	WISSAHICKON	LA	42R	

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
026	84083 00007 001	VENTURI ROBERT & D	00007	WISSAHICKON	LA	42Z
026	87830 03900 001	KASSER RAYMOND & VICTOR	03900 N	02ND	ST	42R
027	25840 03620 001	HANCHAK PETER & G	03620	CRESSON	ST	42R
027	42120 00701 001	STRAIN E	00701	HERMIT	LA	42R
027	42140 05280 001	NICHOLAS ELMER	05280	HERMIT	ST	42R
027	46220 00645 001	LAPWORTH GEORGE R	00645 W	JOHNSON	ST	42R
027	61860 00017 001	REYNOLDS WILLIE & S	00017	OSBORN	ST	42R
027	61860 00019 001	STANLEY J SWIDER	00019	OSBORN	ST	42R
027	61860 00021 001	MILLER MORTON D	00021	OSBORN	ST	42R
027	61860 00023 001	LABIK THELMA	00023	OSBORN	ST	42R
027	61860 00025 001	E ESBENSEN	00025	OSBORN	ST	42R
027	61860 00027 001	BULLOCK WILLIAM	00027	OSBORN	ST	42R
027	61860 00029 001	ANNA O KIRKER	00029	OSBORN	ST	42R
027	61860 00289 001	KREIDER KRISTEN	00289	OSBORN	ST	42R
028	28440 05320 001	DIXON ROBERT E	05320	DIAMOND	ST	42R
029	71960 00416 001	DI ORIO HENRY	00416	SEVILLE	ST	42R
030	43700 04256 001	BASS MARK	04256	HOUGHTON	ST	42R
031	18300 04209 001	E MARRITS	04209	BOONE	ST	42R
031	18300 04215 001	J BORIS	04215	BOONE	ST	42R
031	34380 04579 001	FERENCHEK MICHELLE	04579	FLEMING	ST	42R
034	18300 04489 001	M SAUVAGEOT	04489	BOONE	ST	42R
034	21640 00326 001	A & S DROZDOWSKI	00326	CARSON	ST	42R
034	38380 00115 001	WHITEHEAD HENRIETTA	00115	GREEN	LA	42R
034	73120 04510 001	A W & E M SEGLETES	04510	SMICK	ST	42R
035	29580 00639 R01	A SPINELLI & J KROHN	00639	DUPONT	ST	42R
035	29580 00639 R02	NACE HARRISON	00639	DUPONT	ST	42R
035	29580 00641 001	LOUIS J LEECH	00641	DUPONT	ST	42R
035	49640 06815 001	V & H OTSKIVI	06815	LAWNTON	ST	42R
035	49640 06820 001	BUCCIERO VINCENT	06820	LAWNTON	ST	42R
035	49640 06825 001	WILLIAMS LUCIA ANNE	06825	LAWNTON	ST	42R
035	78840 04862 001	STEEL WORKS ASSOC	04862	UMBRIA	ST	42R
035	78840 05001 001	MIRABILE MARIE	05001	UMBRIA	ST	42R
036	28000 01143 001	BATEMAN BROS LUMBER CO IN	01143 N	DELAWARE	AVE	42R
036	42180 00659 001	GLINSKI MARK ANTHONY	00659	HERMITAGE	ST	42R
036	50480 00606 001	WILLIAM F ELLINGER ETUX	00606	LEVERINGTON	AVE	42R
036	50480 00616 001	ROSENBERG DAVID	00616	LEVERINGTON	AVE	42Z
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036	50480 00624 001	BURNETTE MICHAEL	00624	LEVERINGTON	AVE	42R
037	70780 02554 002	SCHIAVO ANTHONY & V	02554	SALMON	ST	42R
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037	84760 00314 001	BROWN ROBERT	00314	WRIGHT	ST	42R
037	84760 00316 001	DUGGAN MOIRAY C	00316	WRIGHT	ST	42R
038	23220 00259 001	LEONARD ELEANOR ETAL	00259	CINNAMINSON	ST	42R
038	23220 00338 001	ELIZABETH DAVIS	00338	CINNAMINSON	ST	42R
038	23220 00345 001	SPRATT JOHN & D	00345	CINNAMINSON	ST	42R
038	23220 00355 001	BIDDLE RAY	00355	CINNAMINSON	ST	42R
038	23220 00360 001	EMILY M ONEILL	00360	CINNAMINSON	ST	42R
038	23220 00372 001	G FERRARO ETUX	00372	CINNAMINSON	ST	42R
038	23220 00389 001	BALTZ FRANCES V	00389	CINNAMINSON	ST	42R
038	23220 00448 001	TICKNER MARIE C	00448	CINNAMINSON	ST	42R
038	23220 00450 001	SARRO ANNA	00450	CINNAMINSON	ST	42R
038	23220 00452 001	BOHLEMAN MARY E	00452	CINNAMINSON	ST	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
038	23220 00459 001	HETTEL BARBARA	00459	CINNAMINSON	ST	42R
038	23220 00460 001	HARRY WHITCOMB	00460	CINNAMINSON	ST	42R
038	23220 00463 001	MC INERNEY KEVIN & P	00463	CINNAMINSON	ST	42R
038	23220 00465 001	OWENS EDWARD & E	00465	CINNAMINSON	ST	42R
038	23800 06910 001	E RAUCH ETUX	06910	CLIFF	RD	42R
038	23800 06918 001	J A SALDUTTI	06918	CLIFF	RD	42R
038	23800 06950 001	PERILLO JOSEPH A	06950	CLIFF	RD	42R
038	28120 00211 001	A E & A M DREW	00211	DELMAR	ST	42R
038	34820 06951 001	W & C BROWN	06951	FOWLER	ST	42R
038	34820 06957 001	T E & H MEACHAM	06957	FOWLER	ST	42R
038	34820 06959 001	MAYER SCOTT ETAL	06959	FOWLER	ST	42R
038	50180 00203 001	EBNER STEPHEN	00203	LEMONTE	ST	42R
038	50180 00210 001	SHAPIRO M ETAL	00210	LEMONTE	ST	42R
038	50180 00211 001	GAUL HELEN	00211	LEMONTE	ST	42R
038	50180 00214 001	WASSERMAN FREDERICK E JR	00214	LEMONTE	ST	42R
038	50180 00216 001	M J KREPPEL & M	00216	LEMONTE	ST	42R
038	50180 00218 001	JDS C & M GARTNER	00218	LEMONTE	ST	42R
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038	50180 00224 001	W & R KOBIE	00224	LEMONTE	ST	42R
038	50180 00226 001	JONES PATRICIA ANNE	00226	LEMONTE	ST	42R
038	50180 00227 001	HADE JOHN DUANE	00227	LEMONTE	ST	42R
038	50180 00229 001	LENHOFF RONALD F	00229	LEMONTE	ST	42R
038	50180 00232 001	BROWN ADAM ETAL	00232	LEMONTE	ST	42R
038	50180 00240 001	ROGERS ROBERT R	00240	LEMONTE	ST	42R
038	50180 00243 001	SWIFT FLORENCE & J	00243	LEMONTE	ST	42R
038	50180 00244 001	OWNER/OCCUPANT	00244	LEMONTE	ST	42R
038	50180 00247 001	A & P CASSELLI	00247	LEMONTE	ST	42R
038	50180 00248 001	ROSENBERGER EDWARD L JR	00248	LEMONTE	ST	42R
038	50180 00249 001	A CASSELLI	00249	LEMONTE	ST	42R
038	50180 00252 001	J E & E B POLLOCK	00252	LEMONTE	ST	42R
038	50180 00253 001	FORSTER DAVID & SYLVIA	00253	LEMONTE	ST	42R
038	50180 00254 001	JOHN F POLLACK	00254	LEMONTE	ST	42R
038	50180 00258 001	MITSCH RALPH	00258	LEMONTE	ST	42R
038	50180 00273 001	J A REPASH	00273	LEMONTE	ST	42R
038	50180 00406 001	DUDLEY DONNA ETAL	00406	LEMONTE	ST	42Z
038	50180 00406 002	LOUGHLIN MICHAEL ETAL	00406	LEMONTE	ST	42R
038	50360 00376 001	MONDIMORE PAUL A	00376	LEROY	ST	42R
038	50360 00388 001	VECCHIONE ANDREW & K	00388	LEROY	ST	42R
038	50360 00392 001	F & E FAHS	00392	LEROY	ST	42R
038	51220 00382 001	TORRANCE R C	00382	LIVEZEY	ST	42R
038	51220 00364 001	BELLINA ANTHONY	00364	LIVEZEY	ST	42R
038	51220 00365 001	J E & D PORTER	00365	LIVEZEY	ST	42R
038	51220 00367 001	TORRES ALBERT & D	00367	LIVEZEY	ST	42R
038	51220 00403 001	J R BALLARD & O M	00403	LIVEZEY	ST	42R
038	51220 00409 001	WM J DOWNEY ETUX	00409	LIVEZEY	ST	42R
038	51220 00410 001	C & T BATEMAN	00410	LIVEZEY	ST	42R
038	51220 00411 001	GOLTZ PAUL & G	00411	LIVEZEY	ST	42R
038	51220 00413 001	N & F HOLLAND	00413	LIVEZEY	ST	42R
038	51220 00550 001	ZALESKI FRANK & R	00550	LIVEZEY	ST	42R
038	56480 06700 001	PARKINSON CHARLES	06700	MITCHELL	ST	42R
038	56480 06707 001	HANDZUS JAMES M & SHARON	06707	MITCHELL	ST	42R
038	56480 06721 001	THE SALVATION ARMY	06721	MITCHELL	ST	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
038	56480 06746 001	STEIN MICHAEL C	06746	MITCHELL	ST	42R
038	56480 06803 001	YOST REGINA M	06803	MITCHELL	ST	42R
038	56480 06805 001	DUCA NICK	06805	MITCHELL	ST	42R
038	62900 00271 002	IANNUZZI G	00271	PAOLI	AVE	42R
038	62900 00273 001	VASSALLO CURT & C	00273	PAOLI	AVE	42R
038	62900 00281 001	DOMINICK AVATO ETUX	00281	PAOLI	AVE	42R
038	62900 00329 001	A & D BILSTEIN	00329	PAOLI	AVE	42R
038	62900 00374 001	ANTINUCCI CARL	00374	PAOLI	AVE	42R
038	62900 00378 001	DENNIS VOLK	00378	PAOLI	AVE	42R
038	62900 00409 001	CAPECE DOMINIC	00409	PAOLI	AVE	42R
038	62900 00420 001	OWENS GERALD R	00420	PAOLI	AVE	42R
038	62900 00421 001	NYGREN EDITH	00421	PAOLI	AVE	42R
038	62900 00451 001	HILL WILLIAM E	00451	PAOLI	AVE	42R
038	62900 00464 001	J & J LOSCHIAVO	00464	PAOLI	AVE	42R
038	62900 00465 001	ULMER CLAIRE	00465	PAOLI	AVE	42R
038	62900 00466 001	SPECCHIALO ANDREW M	00466	PAOLI	AVE	42R
038	62900 00468 001	HARRY & ELIZ RUGGIERO	00468	PAOLI	AVE	42R
038	62900 00469 001	GARVEY WALTER	00469	PAOLI	AVE	42R
038	62900 00479 001	MC GEE EUGENE	00479	PAOLI	AVE	42R
038	62900 00481 001	HEISER JOHN	00481	PAOLI	AVE	42R
038	62900 00484 001	CARNEY JAMES & J	00484	PAOLI	AVE	42R
038	63020 00563 001	M J MILLER ETUX	00563	PARKER	AVE	42R
038	63020 00565 001	KINGKINER ELMER E	00565	PARKER	AVE	42R
038	63020 00584 001	KEEHN LAWRENCE C	00584	PARKER	AVE	42R
038	63420 06944 001	PROCACCINO LINDA ETAL	06944	PAWLING	ST	42R
038	63620 06714 001	J & B SZELIGA	06714	PECHIN	ST	42R
038	63620 06820 001	F & R FERRIS	06820	PECHIN	ST	42R
038	63620 06980 001	SNYDER THOMAS F & JANET	06980	PECHIN	ST	42R
038	68780 00001 A01	JONES ROBERT DAVID & B	00001	RIVER	RD	42R
038	68780 00001 B01	A & B DE VUONO ETUX	00001	RIVER	RD	42R
038	68780 00001 001	PARKER KEN	00001	RIVER	RD	42R
038	68780 00002 A01	PALMER ROSSI	00002	RIVER	RD	42R
038	68780 00002 B01	REDCAY PAUL B	00002	RIVER	RD	42R
038	68780 00002 C01	ROSSI P	00002	RIVER	RD	42R
038	68780 00002 001	KOBIE GARY	00002	RIVER	RD	42R
038	68780 00003 A03	FOYLE ROBERT	00003	RIVER	RD	42R
038	68780 00003 A04	MACHAN CONANT K & DAVID S	00003	RIVER	RD	42R
038	68780 00003 001	PHILA RAMBLERS INC	00003	RIVER	RD	42R
038	68780 00005 001	MIELCAREK JOHN	00005	RIVER	RD	42R
038	68780 00008 C01	NATALO ROSE	00008	RIVER	RD	42R
038	68780 00006 001	OMLOR SARA	00006	RIVER	RD	42R
038	68780 00007 001	SZAJNA WALTER	00007	RIVER	RD	42R
038	68780 00010 001	STOTESBURY EDWARD	00010	RIVER	RD	42R
038	68780 00011 001	STOTESBURY EDWARD T JR	00011	RIVER	RD	42R
038	68780 00014 001	MODZIANOWSKI FRANK	00014	RIVER	RD	42Z
038	68780 00016 A01	MACKELL BERNARD	00016	RIVER	RD	42R
038	68780 00016 001	SINGER JOHN	00016	RIVER	RD	42R
038	68780 00017 001	KASE JOSEPH	00017	RIVER	RD	42R
038	68780 00018 A01	TINNENY HELEN M	00018	RIVER	RD	42R
038	68780 00020 001	SMALL ROBERT & ANNE	00020	RIVER	RD	42R
038	68780 00021 A01	OSADA BARBARA & GEORGE	00021	RIVER	RD	42Z
038	68780 00022 D02	WASHKO JOSEPHINE	00022	RIVER	RD	42R

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038	68780 00022 001	SPONHEIMER HILDEGARD	00022	RIVER	RD	42R
038	68780 00023 001	VANDERGRIFT	00023	RIVER	RD	42R
038	68780 00023 002	RYAN DONALD J	00023	RIVER	RD	42Z
038	68780 00024 A01	MELLOR JACQULINE	00024	RIVER	RD	42R
038	68780 00025 001	OSADA BRINGHURST BARBARA	00025	RIVER	RD	42Z
038	68780 00025 002	FEIGEL HARRY	00025	RIVER	RD	42R
038	68780 00027 001	PHILA SWIM CLUB INC	00027	RIVER	RD	42R
038	71500 01140 001	SCHULTZ MARY	01140 E	SEDGLEY	AVE	42R
038	72880 06975 001	A LO POPOLO & M E	06975	SILVERWOOD	ST	42R
038	72880 06985 001	CAPECE THOMAS	06985	SILVERWOOD	ST	42R
038	72880 07017 001	DRAMIS AUGUSTUS	07017	SILVERWOOD	ST	42R
038	72880 07019 001	HOJABR-KIANI FARIVAR	07019	SILVERWOOD	ST	42R
039	26300 07500 001	MILLER FRANK & MILDRED	07500	CULP	ST	42R
039	26300 07501 001	DOLAN PATRICIA A	07501	CULP	ST	42R
039	26300 07502 001	AUGENBRAUN DAVID & L	07502	CULP	ST	42R
039	26300 07503 001	VINCENT L HUGHES	07503	CULP	ST	42R
039	26300 07504 001	FRANCIS V PETRELLIS	07504	CULP	ST	42R
039	26300 07507 001	C & B MC ANALLY	07507	CULP	ST	42R
039	26300 07508 001	SNYDER ELIZABETH A	07508	CULP	ST	42R
039	26300 07509 001	ZURAKOWSKI WALLACE	07509	CULP	ST	42R
039	26300 07514 001	FIORAVANTI E & M	07514	CULP	ST	42R
039	26300 07515 001	FRANK CIOCARI	07515	CULP	ST	42R
039	26300 07517 001	LUDOVICI GIUSTINO	07517	CULP	ST	42R
039	26300 07518 001	JUERGEN KAUFMANN	07518	CULP	ST	42R
039	27840 00280 001	J BILINSKI	00280	DEARNLEY	ST	42R
039	27840 00300 001	BETTERIDGE JEFFREY & K	00300	DEARNLEY	ST	42R
039	27840 00389 001	MARTELLI GIUSEPPE&D	00389	DEARNLEY	ST	42R
039	27840 00401 001	SOMOGYI ROBERT	00401	DEARNLEY	ST	42R
039	27840 00403 001	BOWEN JOHN	00403	DEARNLEY	ST	42R
039	27840 00409 001	DEVINE JAMES J & VIOLET A	00409	DEARNLEY	ST	42R
039	27840 00411 001	FLORENCE T HANSEN	00411	DEARNLEY	ST	42R
039	27840 00415 001	M F & D BATEMAN	00415	DEARNLEY	ST	42R
039	27840 00417 001	R & T SULIK	00417	DEARNLEY	ST	42R
039	27840 00423 001	V MICHNIEWICZ	00423	DEARNLEY	ST	42R
039	27840 00425 001	G & C LITTEL	00425	DEARNLEY	ST	42R
039	27840 00431 001	CAVANNAUGH DANIEL & C	00431	DEARNLEY	ST	42R
039	27840 00448 001	WM & RUTH FOX	00448	DEARNLEY	ST	42R
039	33320 00543 001	KIRSTEIER THOMAS & D	00543	FAIRTHORNE	AVE	42Z
039	34320 00195 001	WILLIAM W WEISSMAN	00195	FLAMINGO	ST	42R
039	34320 00201 001	GUYER WARREN &J	00201	FLAMINGO	ST	42R
039	34320 00354 001	SCHOFIELD RUTH	00354	FLAMINGO	ST	42R
039	34320 00358 001	PETYK ROMAN	00358	FLAMINGO	ST	42R
039	34320 00362 001	TORRES CESAR	00362	FLAMINGO	ST	42R
039	34320 00368 001	DURCIO KENNETH GLENN	00368	FLAMINGO	ST	42R
039	34320 00380 001	FACCHIARO ALBERT & E	00380	FLAMINGO	ST	42R
039	34320 00384 001	KAUFFMANN RICHARD	00384	FLAMINGO	ST	42R
039	34320 00390 001	BUSCHMANN MARK	00390	FLAMINGO	ST	42R
039	34320 00394 001	GREENE HOWARD & D	00394	FLAMINGO	ST	42R
039	34320 00398 001	BIANCO SALVATORE & D	00398	FLAMINGO	ST	42R
039	34320 00414 001	HAYES MARY F	00414	FLAMINGO	ST	42R
039	34320 00416 001	WM E DONNELLY	00416	FLAMINGO	ST	42R
039	34320 00418 001	H MC COY & J	00418	FLAMINGO	ST	42R

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039	34320 00422 001	KOCH FERDINAND	00422	FLAMINGO	ST	42R
039	34320 00426 001	A S PAILLARD	00426	FLAMINGO	ST	42R
039	34320 00427 001	MORRIS L & J CARROW	00427	FLAMINGO	ST	42R
039	34320 00428 001	HERMAN W JAMES & K	00428	FLAMINGO	ST	42R
039	34320 00432 001	J F STEWART JR & J T	00432	FLAMINGO	ST	42R
039	34320 00436 001	T J MOWER & A T	00436	FLAMINGO	ST	42R
039	34320 00438 001	J H ROWLEY & D	00438	FLAMINGO	ST	42R
039	34320 00440 001	FRANK P RIGHTER	00440	FLAMINGO	ST	42R
039	34320 00441 001	LE BLANC RONALD J	00441	FLAMINGO	ST	42R
039	34320 00442 001	DI GIOVANNI ANGELO G	00442	FLAMINGO	ST	42R
039	34320 00444 001	BAILEY J	00444	FLAMINGO	ST	42R
039	34320 00446 001	D SPANGLER ETUX	00446	FLAMINGO	ST	42R
039	34320 00447 001	CARL KANDRA	00447	FLAMINGO	ST	42R
039	34320 00448 001	R A SHIELDS 3RD ETUX	00448	FLAMINGO	ST	42R
039	34320 00449 001	H E & E W FITCH JR	00449	FLAMINGO	ST	42R
039	34320 00450 001	LUTSKY JULIA	00450	FLAMINGO	ST	42R
039	34320 00451 001	WONDERLY CHARLES	00451	FLAMINGO	ST	42R
039	34320 00452 001	GOLBESKI ROBERT M & H	00452	FLAMINGO	ST	42R
039	34320 00453 001	BEAN NORMAN C	00453	FLAMINGO	ST	42R
039	34320 00454 001	DEVITT SARA	00454	FLAMINGO	ST	42R
039	34320 00455 001	MURPHY STEVEN	00455	FLAMINGO	ST	42R
039	34320 00456 001	LAMBERT WILLIAM	00456	FLAMINGO	ST	42R
039	34320 00457 001	LOVELL MARIAM E ETAL	00457	FLAMINGO	ST	42R
039	34320 00458 001	KACH DOROTHY	00458	FLAMINGO	ST	42R
039	34320 00459 001	GEORGE M CHERNIS	00459	FLAMINGO	ST	42R
039	34320 00461 001	PAPIRO GERARDO & J	00461	FLAMINGO	ST	42R
039	34320 00465 001	WILSON JOHN & E	00465	FLAMINGO	ST	42R
039	34320 00468 001	MORRISON MARTIN R	00468	FLAMINGO	ST	42R
039	34320 00474 001	SCARLETT JOSEPH	00474	FLAMINGO	ST	42R
039	34820 07500 001	J A MC CONNELL & B	07500	FOWLER	ST	42R
039	34820 07508 001	BELTZ R & DICICCO A	07508	FOWLER	ST	42R
039	34820 07512 001	EUKENS EARL	07512	FOWLER	ST	42R
039	41960 07002 001	PANNELLA JOSEPHINE	07002	HENRY	AVE	42R
039	41960 07368 001	P N GALLAGHER	07368	HENRY	AVE	42R
039	41960 07400 001	J & E MICHEL	07400	HENRY	AVE	42R
039	41960 07706 001	FRANCIS V LAWLOR ETUX	07706	HENRY	AVE	42R
039	47160 07701 001	MC MENAMIN SHARON	07701	KEIFFER	ST	42R
039	49560 07500 001	KELLEY CHARLES & J	07500	LAWN	ST	42R
039	49560 07501 001	WASSERMAN FREDERICK	07501	LAWN	ST	42R
039	49560 07502 001	STANLEY WILLIAM	07502	LAWN	ST	42R
039	49560 07504 001	ERNEST J NOLASCO	07504	LAWN	ST	42R
039	49560 07506 001	BROWN CHARLES & D	07506	LAWN	ST	42R
039	49560 07508 001	KENNY E & ROBERT L	07508	LAWN	ST	42R
039	49560 07509 001	R & B LEES	07509	LAWN	ST	42R
039	49560 07510 001	PAUL A & P ROSSI	07510	LAWN	ST	42R
039	49560 07515 001	JOHN H DAVISON ETUX	07515	LAWN	ST	42R
039	49560 07524 001	GILL TIMOTHY P	07524	LAWN	ST	42R
039	49640 07701 001	W H SIMPSON	07701	LAWNTON	ST	42R
039	53260 07500 001	BUSCHMANN WERNER & G	07500	MANTI	ST	42R
039	53260 07501 001	GROSS HARRY W	07501	MANTI	ST	42R
039	53260 07504 001	C & D STEFANOWICZ	07504	MANTI	ST	42R
039	53260 07505 001	DONAHUE WALTER 3RD ETUX	07505	MANTI	ST	42R

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039	53260 07508 001	BUDRONI MICHAEL	07508	MANTI	ST	42R
039	53260 07509 001	COHEN ANN	07509	MANTI	ST	42R
039	53260 07510 001	C H & D GROOM JR	07510	MANTI	ST	42R
039	53260 07512 001	BRANSFIELD PAUL J	07512	MANTI	ST	42R
039	53260 07513 001	ROBIN K GRAY ETUX	07513	MANTI	ST	42R
039	53260 07516 001	WHITE MARILYN B	07516	MANTI	ST	42R
039	53260 07517 001	POSTELL ROBERT A	07517	MANTI	ST	42R
039	59680 07501 001	D & J BROWN	07501	NEWLAND	ST	42R
039	59680 07504 001	GEORGE W KINDON	07504	NEWLAND	ST	42R
039	59680 07505 001	H M & H J MORROW	07505	NEWLAND	ST	42R
039	59680 07506 001	FELIX ELIZABETH	07506	NEWLAND	ST	42R
039	59680 07508 001	MC GONIGLE HELEN	07508	NEWLAND	ST	42R
039	59680 07509 001	BOOTH THOMAS & M	07509	NEWLAND	ST	42R
039	59680 07513 001	JOHN R STAUFFENBERG	07513	NEWLAND	ST	42R
039	59680 07514 001	D & B WHITE	07514	NEWLAND	ST	42R
039	59680 07516 001	BYRNE DAVID J	07516	NEWLAND	ST	42R
039	59680 07517 001	E E HADIK ETUX	07517	NEWLAND	ST	42R
039	59680 07518 001	LOFFELHARDT W	07518	NEWLAND	ST	42R
039	61620 00450 001	KURTZ DENNIS & R	00450	ORIOLE	ST	42R
039	61620 00454 001	YAHN NAOMI	00454	ORIOLE	ST	42R
039	61620 00455 001	DEGOVANNI T & L	00455	ORIOLE	ST	42R
039	61620 00457 001	MC CABE BERNARD & A	00457	ORIOLE	ST	42Z
039	63420 07500 001	BOLGER, ARTHUR & E	07500	PAWLING	ST	42R
039	63420 07501 001	LING WILLIAM D	07501	PAWLING	ST	42R
039	63420 07506 001	J & E CARR	07506	PAWLING	ST	42R
039	63420 07515 001	JONES TERRY	07515	PAWLING	ST	42R
039	63420 07517 001	SADO JOSEPH G	07517	PAWLING	ST	42R
039	63420 07518 001	WILLIAM T MORRIS ETUX	07518	PAWLING	ST	42R
039	68280 06783 001	BATEMAN ROY	06783	RIDGE	AVE	42R
039	68280 06918 001	JANZANO HENRY	06918	RIDGE	AVE	42R
039	68280 07014 001	FAMILY PARTNERS	07014	RIDGE	AVE	42R
039	68280 07226 001	MILLER WARREN F	07226	RIDGE	AVE	42R
039	68280 07257 001	FORCE FARHAD	07257	RIDGE	AVE	42R
039	68280 07300 A01	E & J STASUL	07300	RIDGE	AVE	42R
039	68280 07303 001	J & L VIZZARD	07303	RIDGE	AVE	42R
039	68280 07370 001	FALCONE OTTAVIO	07370	RIDGE	AVE	42R
039	68280 07515 001	CASELLI ANGELO & D	07515	RIDGE	AVE	42R
039	68280 07535 001	W R & I K CLARK	07535	RIDGE	AVE	42R
039	68280 07537 001	M V STANZIANI & J	07537	RIDGE	AVE	42R
039	68280 07551 001	HERBERT ROBERT G	07551	RIDGE	AVE	42R
039	68280 07552 001	BENJAMIN HEILBRON	07552	RIDGE	AVE	42R
039	68280 07558 001	REDMOND ELEANOR	07558	RIDGE	AVE	42R
039	68280 07563 001	COLANTONIO ANTHONY	07563	RIDGE	AVE	42R
039	68280 07571 001	PUBLIC STORAGE PROP XVII	07571	RIDGE	AVE	42R
039	69220 06410 001	ZANONI LINO G	06410 E	ROOSEVELT	BLV	42R
039	72280 07501 001	CORNELL JOSEPH P	07501	SHAW	ST	42R
039	72280 07505 001	MASSELLA ROBERT & M	07505	SHAW	ST	42R
039	72280 07509 002	ALBERT CASTELLANI	07509	SHAW	ST	42R
039	72280 07515 001	MATTEO ERNEST	07515	SHAW	ST	42R
039	72280 07516 001	ROBERT H WILKINSON ETAL	07516	SHAW	ST	42R
039	72280 07532 001	A & J PROZACK	07532	SHAW	ST	42R
039	72280 07538 001	BARILE ERNEST & G	07538	SHAW	ST	42R

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039	72280 07540 001	FORST VERA	07540	SHAW	ST	42R
039	72280 07542 001	GOURLEY EDWARD	07542	SHAW	ST	42R
039	72300 00700 001	RANDALL CYNTHIA	00700	SHAWMONT	AVE	42R
039	72300 00712 001	W E BOWDEN ETUX	00712	SHAWMONT	AVE	42R
039	72300 00714 001	ARENTZEN EDWARD A & M	00714	SHAWMONT	AVE	42R
039	72300 00716 001	DURANTE LOUIS	00716	SHAWMONT	AVE	42R
039	72300 00720 001	SEGAL RONALD	00720	SHAWMONT	AVE	42R
039	72300 00747 001	LALLY FRANCIS J	00747	SHAWMONT	AVE	42R
039	72300 00765 001	FOELSTER STEPHEN	00765	SHAWMONT	AVE	42R
039	83080 00343 001	BORGHESI COLUMBUS	00343	WIGARD	AVE	42R
039	83080 00347 001	DI ORIO ANTHONY & P	00347	WIGARD	AVE	42R
039	83080 00351 001	COYNE ELEANOR M	00351	WIGARD	AVE	42R
039	83080 00361 001	MAXEIN EUGENE J	00361	WIGARD	AVE	42R
039	83080 00385 001	W B & M JANUSZ	00385	WIGARD	AVE	42R
039	83080 00407 001	HEMMANN BEATE	00407	WIGARD	AVE	42R
039	83080 00428 001	GOLASA ALBERT & L	00428	WIGARD	AVE	42R
039	83080 00434 001	THOS C DUFFEY	00434	WIGARD	AVE	42R
039	83080 00437 001	CHRISTOPHER MOWER ETUX	00437	WIGARD	AVE	42R
039	83080 00439 001	WASSERMAN FREDERICK JR	00439	WIGARD	AVE	42R
039	83080 00440 001	CLAIRE K ALLEN	00440	WIGARD	AVE	42R
039	83080 00443 001	B & R PALKO	00443	WIGARD	AVE	42R
039	83080 00446 001	PETRUCCI JERRY	00446	WIGARD	AVE	42R
039	83080 00449 001	WM & LILY MC MONAGLE	00449	WIGARD	AVE	42R
039	83080 00475 001	J & M MYERS	00475	WIGARD	AVE	42R
039	83080 00485 001	GALLAGHER WILLIAM A	00485	WIGARD	AVE	42R
039	83080 00576 001	DEVENNEY JOHN P	00576	WIGARD	AVE	42R
039	83080 00609 001	J P & E B FUGELO	00609	WIGARD	AVE	42R
039	83080 00610 001	MC GEEHAN J & F	00610	WIGARD	AVE	42R
039	83080 00611 001	A MACCHIONE	00611	WIGARD	AVE	42R
039	83080 00613 001	L & J BLASETTI	00613	WIGARD	AVE	42R
039	83080 00615 001	OTELLO ALESSIO	00615	WIGARD	AVE	42R
039	83080 00620 001	HARKER ALBERT	00620	WIGARD	AVE	42R
039	83080 00625 005	KELLY T & H	00625	WIGARD	AVE	42Z
039	83080 00642 001	WENK MARYJANE S	00642	WIGARD	AVE	42R
039	83080 00645 006	H & A STONE	00645	WIGARD	AVE	42Z
039	83080 00646 001	E OLEKSIAK	00646	WIGARD	AVE	42R
039	83080 00648 001	HUTCHINSON WILLIAM	00648	WIGARD	AVE	42R
039	83080 00650 001	BURRINGTON HELEN	00650	WIGARD	AVE	42R
039	84000 00615 001	SZASTYNSKI HELEN	00615	WISES MILL	RD	42R
039	84000 00617 001	D & L DELL AGUZZO	00617	WISES MILL	RD	42R
039	84000 00627 001	CODY BETH ANNE	00627	WISES MILL	RD	42R
039	84000 00631 001	CARMEN R HANTZ	00631	WISES MILL	RD	42R
040	14120 00461 001	HEFFERN DOROTHEA E	00461	AURANIA	ST	42R
040	14120 00464 001	MILLER CLIFFORD	00464	AURANIA	ST	42R
040	14120 00467 001	G B T P P ESTERHELD	00467	AURANIA	ST	42R
040	14120 00470 001	WASILIWSKI LORETTA	00470	AURANIA	ST	42R
040	14120 00471 001	ROGERS HARRY & H	00471	AURANIA	ST	42R
040	14120 00472 001	E R & R E WHITESEL	00472	AURANIA	ST	42R
040	14120 00473 001	HUDICK JANET S	00473	AURANIA	ST	42R
040	14120 00474 001	PRESENT ELIOT	00474	AURANIA	ST	42R
040	14120 00475 001	W F CONNOLLY JR & M B	00475	AURANIA	ST	42R
040	18900 08604 001	VOLPE STEPHEN E	08604	BRIERDALE	RD	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
040	18900 08605 001	VECCHIO SEBASTIAN & C	08605	BRIERDALE	RD	42R
040	18900 08606 001	COOGAN WILLIAM	08606	BRIERDALE	RD	42R
040	18900 08607 001	BUCKLEY BERDELL & R	08607	BRIERDALE	RD	42R
040	18900 08609 001	J & J WRIGHT	08609	BRIERDALE	RD	42R
040	20780 07900 001	EOW DONOVAN ETUX	07900	CADILLAC	LA	42R
040	20780 07901 001	CALLAHAN BEVERLY	07901	CADILLAC	LA	42R
040	20780 07902 001	ENRICO CIMINI ETUX	07902	CADILLAC	LA	42R
040	20780 07904 001	BARILE ERNEST J III	07904	CADILLAC	LA	42R
040	20780 07908 001	W J RAMBO ETUX	07908	CADILLAC	LA	42R
040	20780 07920 001	DAVIS HELEN	07920	CADILLAC	LA	42R
040	20780 07924 001	R H STRAHLENDORF	07924	CADILLAC	LA	42R
040	22900 00620 001	FILANDWSKI ANTHONY & M	00620	CHESWICK	RD	42R
040	25940 00600 001	RODGERS ELLA MAE	00600	CRESTVIEW	RD	42R
040	25940 00608 001	A LOWNES	00608	CRESTVIEW	RD	42R
040	25940 00610 001	RUTH M HILBERG	00610	CRESTVIEW	RD	42R
040	25940 00705 001	PETRELLIS GEORGE	00705	CRESTVIEW	RD	42R
040	25940 00706 001	CHILICKI JEANNE	00706	CRESTVIEW	RD	42R
040	25940 00708 001	MAC FARLAND-KOEHLER JEANN	00708	CRESTVIEW	RD	42R
040	25940 00709 001	KAYSER JERRY	00709	CRESTVIEW	RD	42R
040	25940 00711 001	LUGARA JOSEPH & P	00711	CRESTVIEW	RD	42R
040	25940 00712 001	BRATTON EDITH M	00712	CRESTVIEW	RD	42R
040	25940 00722 001	DYMSZO DENNIS & J	00722	CRESTVIEW	RD	42R
040	25940 00725 001	J MAIR ETUX	00725	CRESTVIEW	RD	42R
040	25940 00726 001	ROWLEY PAUL	00726	CRESTVIEW	RD	42R
040	25940 00727 001	ROOP JAMES JR	00727	CRESTVIEW	RD	42R
040	25940 00731 001	TAYLOR MARGUERITE	00731	CRESTVIEW	RD	42R
040	25940 00800 001	CANNON KEVIN & RICKS J	00800	CRESTVIEW	RD	42R
040	32400 07802 001	J & D FRIEL	07802	EVA	ST	42R
040	32400 07806 001	HADDEN ANNE E	07806	EVA	ST	42R
040	32400 07810 001	SULIK STEVE	07810	EVA	ST	42R
040	32400 07814 001	WEISS WILLIAM & A	07814	EVA	ST	42R
040	32400 07820 001	MARSHALL ELLEN	07820	EVA	ST	42R
040	32400 07822 001	KEARNS ROSEMARY W	07822	EVA	ST	42R
040	32400 07824 001	C E WESTWOOD	07824	EVA	ST	42R
040	32400 07826 001	ROBINSON JAMES	07826	EVA	ST	42R
040	32400 07832 001	SORBELLO DOLORES	07832	EVA	ST	42R
040	32400 07939 001	SPOSATO VINCENT	07939	EVA	ST	42R
040	32400 07941 001	BERTIG HARRY & T	07941	EVA	ST	42R
040	32500 00444 001	BRONCA GEORGE C	00444	EVERGREEN	AVE	42R
040	32500 00446 001	MARKHAM W	00446	EVERGREEN	AVE	42R
040	32500 00448 001	PETRELLIS V	00448	EVERGREEN	AVE	42R
040	32500 00449 001	CODPER L & T	00449	EVERGREEN	AVE	42R
040	32500 00450 001	SEREPY SIGMUND J	00450	EVERGREEN	AVE	42R
040	32500 00456 001	ROBINSON WARREN	00456	EVERGREEN	AVE	42R
040	32500 00458 001	PIANELLI C	00458	EVERGREEN	AVE	42R
040	32500 00461 001	SUDELL FRANCIS X	00461	EVERGREEN	AVE	42R
040	32500 00464 001	DEVITT GEORGE & ANNA	00464	EVERGREEN	AVE	42R
040	32500 00465 001	ROBINSON LESLIE L	00465	EVERGREEN	AVE	42R
040	32500 00466 001	OMLOR DAVID & P	00466	EVERGREEN	AVE	42R
040	32500 00467 001	MC CLUSKEY J E	00467	EVERGREEN	AVE	42R
040	32500 00468 001	BONGARD STEPHEN	00468	EVERGREEN	AVE	42R
040	32500 00469 001	LEVIN JAY S	00469	EVERGREEN	AVE	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
040	32500 00470 001	RAUSCHER FRANCIS & G	00470	EVERGREEN	AVE	42R
040	32500 00471 001	THOMAS JOSEPH & D	00471	EVERGREEN	AVE	42R
040	32500 00472 001	KISCADEN HARRY	00472	EVERGREEN	AVE	42R
040	32500 00473 001	KOST V F & P A	00473	EVERGREEN	AVE	42R
040	32500 00474 001	MC ENTEE GERARD & DONNA	00474	EVERGREEN	AVE	42R
040	32500 00475 001	HEMPLE ELLEN	00475	EVERGREEN	AVE	42R
040	32500 00476 001	PERACCO PATRICK & BARBARA	00476	EVERGREEN	AVE	42R
040	32500 00477 001	HEMPLE JAMES	00477	EVERGREEN	AVE	42R
040	32500 00478 001	MULLER W & A	00478	EVERGREEN	AVE	42R
040	32500 00480 001	VETTER HARRY M	00480	EVERGREEN	AVE	42R
040	32500 00482 001	FORSTER STEPHAN III	00482	EVERGREEN	AVE	42R
040	32540 00483 001	SNYDER GEORGE & SANDRA	00463 W	EVERGREEN	AVE	42R
040	36740 07717 D03	OWNER/OCCUPANT	07717	GETTYSBURG	AVE	42R
040	36740 07824 001	W & A CONDIT	07824	GETTYSBURG	AVE	42R
040	36740 07830 001	WILBY RUTH & M	07830	GETTYSBURG	AVE	42R
040	36740 07844 001	L & J CROWE	07844	GETTYSBURG	AVE	42R
040	37960 00708 001	J FIORAVANTI ETUX	00708	GRAKYN	LA	42R
040	37960 00712 001	GUNNING DAVID & DONNA	00712	GRAKYN	LA	42R
040	37960 00716 001	SPANGENBERG EARL & C	00716	GRAKYN	LA	42R
040	37960 00720 001	WILLIAM J CUTE	00720	GRAKYN	LA	42R
040	37960 00807 001	BEATRICE K EATON	00807	GRAKYN	LA	42R
040	37960 00811 001	WATERLOO FRANK	00811	GRAKYN	LA	42R
040	37960 00820 001	A & M GOLDBECK	00820	GRAKYN	LA	42R
040	38140 07800 001	HARRITY CHARLES & S	07800	GRANVILLE	RD	42R
040	38140 07804 001	MILLER ELLIOTT	07804	GRANVILLE	RD	42R
040	38140 07805 001	CIESIEKA STANLEY & C	07805	GRANVILLE	RD	42R
040	38140 07809 001	RAUSCHER CHARLES	07809	GRANVILLE	RD	42R
040	38140 07810 001	JOAN E HURLOCK MD LTD	07810	GRANVILLE	RD	42R
040	38140 07830 001	JOHNSON KEITH & ROSEMARY	07830	GRANVILLE	RD	42R
040	39840 08325 D02	FITZPATRICK JOHN	08325	HAGYS MILL	RD	42R
040	40680 08415 001	R B SEARLE & M L	08415	HARNER	ST	42R
040	40680 08419 001	J L & M M SOWDEN	08419	HARNER	ST	42R
040	40680 08423 001	KOBSAR JOSEPH & WISE E	08423	HARNER	ST	42R
040	40680 08427 001	A W TORRE JR ETUX	08427	HARNER	ST	42R
040	40680 08431 001	W MICHAELDINDA & M L	08431	HARNER	ST	42R
040	40680 08435 001	D ANGELO JOSEPH & P	08435	HARNER	ST	42R
040	40680 08439 001	R R & M J CUNNINGHAM	08439	HARNER	ST	42R
040	40680 08501 001	OAKES ROSEMARIE & E	08501	HARNER	ST	42R
040	40680 08503 001	STEPHEN BURK	08503	HARNER	ST	42R
040	40680 08505 001	G & S BURK	08505	HARNER	ST	42R
040	41860 00604 001	HARTY FRANCES	00604	HENDREN	ST	42R
040	41860 00610 001	GALLAGHER CHARLES F III	00610	HENDREN	ST	42R
040	41860 00620 001	KEELY WALTER	00620	HENDREN	ST	42R
040	41860 00630 001	E V & J CARUSO	00630	HENDREN	ST	42R
040	41860 00640 001	L DI MUZIO	00640	HENDREN	ST	42R
040	41860 00641 001	R & H HAMILTON	00641	HENDREN	ST	42R
040	41860 00643 001	JOSEPH J MC CABE	00643	HENDREN	ST	42R
040	41860 00645 001	KENNEY ELIZABETH	00645	HENDREN	ST	42R
040	41860 00647 001	MC MENAMIN JOHN	00647	HENDREN	ST	42R
040	41860 00649 001	S SALERNO ETUX	00649	HENDREN	ST	42R
040	41860 00650 001	TRAVALINE JOHN & M	00650	HENDREN	ST	42R
040	41860 00700 001	VEIRS BARBA LETITIA BARBA	00700	HENDREN	ST	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
040	41860 00702 001	ASZTALOS ALBERT J	00702	HENDREN	ST	42R
040	41860 00704 001	E NEUMAN	00704	HENDREN	ST	42R
040	41860 00708 001	N & G WOOD	00706	HENDREN	ST	42R
040	41860 00708 001	RUANE MICHAEL E	00708	HENDREN	ST	42R
040	41860 00710 001	ALAN S BARRETT	00710	HENDREN	ST	42R
040	41860 00712 001	CALHOUN MARY	00712	HENDREN	ST	42R
040	41860 00714 001	SIMON JOHN & S	00714	HENDREN	ST	42R
040	41860 00716 001	A J & M E HILANBRAND	00716	HENDREN	ST	42R
040	41860 00718 001	S BECKETT	00718	HENDREN	ST	42R
040	41860 00720 001	PHYLLIS SIMPSON	00720	HENDREN	ST	42R
040	41860 00722 001	RUTH LOIS S	00722	HENDREN	ST	42R
040	41860 00724 001	ALVIN HAMBURG ETUX	00724	HENDREN	ST	42R
040	41860 00726 001	E FISHER	00726	HENDREN	ST	42R
040	41860 00741 001	LONGSTRETH THACHER	00741	HENDREN	ST	42R
040	41860 00745 001	K E FEESS	00745	HENDREN	ST	42R
040	41860 00749 001	F AMEYE ETUX	00749	HENDREN	ST	42R
040	47120 00735 001	ANTHONY VERDE ETUX	00735	KEELY	ST	42R
040	49180 08001 001	JOSEPH P HENKEL ETUX	08001	LARE	ST	42R
040	49180 08003 001	E SOWA ETUX	08003	LARE	ST	42R
040	49180 08005 001	J & R VERICA	08005	LARE	ST	42R
040	49180 08107 001	WH AM SMITH	08107	LARE	ST	42R
040	49180 08125 001	COYNE DORIS F	08125	LARE	ST	42R
040	49180 08135 001	TURINO ROBERT	08135	LARE	ST	42R
040	51720 00001 001	KAMINSKI JANET	00001	LOTHIAN	PL	42R
040	51720 00002 001	SORENSON JOHN H	00002	LOTHIAN	PL	42R
040	51720 00003 001	R F MOOREHEAD & M G	00003	LOTHIAN	PL	42R
040	51720 00004 001	WHEELER CHRISTOPHER	00004	LOTHIAN	PL	42R
040	51720 00005 001	FRED REINITZ	00005	LOTHIAN	PL	42R
040	51720 00006 001	JOSEPH & J CDOGAN	00006	LOTHIAN	PL	42R
040	51720 00007 001	HOWARD FIELD	00007	LOTHIAN	PL	42R
040	51720 00008 001	MAY D FLANAGAN	00008	LOTHIAN	PL	42R
040	53100 00718 001	J A KOLTES & N H	00718	MANATAWNA	AVE	42R
040	53100 00720 001	BENJAMIN E NEWMAN	00720	MANATAWNA	AVE	42R
040	53100 00726 001	T & M CUNNANE	00726	MANATAWNA	AVE	42R
040	53100 00728 001	C CAPOBIANCO	00728	MANATAWNA	AVE	42R
040	53100 00730 001	J J & I M FRIERI	00730	MANATAWNA	AVE	42R
040	53100 00732 001	ENDRIKAT FRED R	00732	MANATAWNA	AVE	42R
040	53100 00734 001	DANGELO J D ETUX	00734	MANATAWNA	AVE	42R
040	53100 00740 001	DILLER FRIEDA	00740	MANATAWNA	AVE	42R
040	53100 00742 001	COWAN JOHN R & KATHRYN	00742	MANATAWNA	AVE	42R
040	53100 00743 001	WM VON BUCKWALD ETUX	00743	MANATAWNA	AVE	42R
040	53100 00758 001	PENSABENE STEVEN & D	00758	MANATAWNA	AVE	42R
040	53100 00810 001	GEO & JOAN A OTT	00810	MANATAWNA	AVE	42R
040	53100 00830 001	MAYALL NOBLE B	00830	MANATAWNA	AVE	42R
040	53100 00844 001	LEDERER THOMAS JR	00844	MANATAWNA	AVE	42Z
040	53100 00847 001	FLYNN MICHAEL & A	00847	MANATAWNA	AVE	42R
040	53100 00851 001	W J STEWART ETUX	00851	MANATAWNA	AVE	42R
040	53100 00855 001	TITTERTON EDWARD G III	00855	MANATAWNA	AVE	42R
040	53100 00859 001	W & K BRESCIA	00859	MANATAWNA	AVE	42R
040	53100 00860 001	HUBBARD CORTLANDT	00860	MANATAWNA	AVE	42Z
040	53100 00863 001	ROBERT BLASI ETUX	00863	MANATAWNA	AVE	42R
040	53100 00867 001	SHELDON JAMES	00867	MANATAWNA	AVE	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
040	53100 00871 001	NUMEC GEORGE	00871	MANATAWNA	AVE	42R
040	56380 00464 001	E A WADDSKY	00464	MINERVA	ST	42R
040	56380 00466 001	MULLEN GERALD J	00466	MINERVA	ST	42R
040	56380 00468 001	CELLUCCI PHILIP	00468	MINERVA	ST	42R
040	56380 00470 001	G W & M A SWAINCOTT	00470	MINERVA	ST	42R
040	56380 00472 001	WEISS JEFFREY C ETUX ETAL	00472	MINERVA	ST	42R
040	56380 00473 001	W & P KROSKY	00473	MINERVA	ST	42R
040	56380 00475 001	CINIRONE JOHN & E	00475	MINERVA	ST	42R
040	56380 00477 001	BARRY W & B RAMBO	00477	MINERVA	ST	42R
040	56380 00478 001	JAMES C & D E WILLIAMS	00478	MINERVA	ST	42R
040	56380 00479 001	POTOCZNY ELSIE	00479	MINERVA	ST	42R
040	56380 00480 001	BORNE JEANNE	00480	MINERVA	ST	42R
040	56380 00481 001	WOLASA MARY E	00481	MINERVA	ST	42R
040	56380 00483 001	J & M WOOD	00483	MINERVA	ST	42R
040	56380 00484 001	CLEGG RICHARD & S	00484	MINERVA	ST	42R
040	56380 00485 001	WIGAND RONALD E	00485	MINERVA	ST	42R
040	56380 00486 001	DOROTHY STANERUCK	00486	MINERVA	ST	42R
040	59920 07816 001	DEL MONTE LOUIS	07816	NIXON	ST	42R
040	60200 00005 D01	TRIGGIAN LEONARD	00005	NORTHWESTERN	AVE	42R
040	61220 08550 001	MASTROIENI M	08550	OLD LINE	RD	42R
040	61220 08576 001	SUMMIT PARK EAST	08576	OLD LINE	RD	42Z
040	63740 08500 001	J & B BASILE	08500	PEMBROOK	RD	42R
040	63740 08501 001	ROY G RANGNOW	08501	PEMBROOK	RD	42R
040	63740 08506 001	IRWIN ESTHER	08506	PEMBROOK	RD	42R
040	63740 08509 001	KIDDER JOSEPH	08509	PEMBROOK	RD	42R
040	68280 07610 001	J & F CONINE	07610	RIDGE	AVE	42R
040	68280 07612 001	W & N JOHNSTON	07612	RIDGE	AVE	42R
040	68280 07616 001	ARTHUR J SLOOK	07616	RIDGE	AVE	42R
040	68280 07700 001	TRAVALINE JOHN & M	07700	RIDGE	AVE	42R
040	68280 07701 001	NARDONE ANTHONY JR & B	07701	RIDGE	AVE	42R
040	68280 07707 001	NARDONE ANTHONY	07707	RIDGE	AVE	42R
040	68280 07709 001	WARTMAN NELLIE	07709	RIDGE	AVE	42R
040	68280 07728 001	CARUSO ENRICO & J	07728	RIDGE	AVE	42R
040	68280 07932 001	BRESLIN DANIEL	07932	RIDGE	AVE	42R
040	68280 08029 001	EVANS & LEWIS INC	08029	RIDGE	AVE	42R
040	68280 08238 002	MC MANUS G	08238	RIDGE	AVE	42R
040	68280 08238 003	MC MANUS G	08238	RIDGE	AVE	42R
040	68280 08727 001	PETRUCCI JAMES L	08727	RIDGE	AVE	42R
040	68280 08739 001	FRUZZETTI ANDREW J JR	08739	RIDGE	AVE	42R
040	68280 08816 001	ROGERS KENNETH & I	08816	RIDGE	AVE	42R
040	68280 08816 013	FISHMAN ROGER &J	08816	RIDGE	AVE	42R
040	68280 08819 001	MESSING JOHN & F	08819	RIDGE	AVE	42R
040	68280 08835 001	U & A GLEARY	08835	RIDGE	AVE	42R
040	68280 08948 001	FRIEDLAND SUE E	08948	RIDGE	AVE	42R
040	68280 08962 001	FRIEDLAND SUEETAL	08962	RIDGE	AVE	42Z
040	68280 08965 001	KIRSCHNER BROS OIL CO	08965	RIDGE	AVE	42R
040	68280 09040 001	ESPOSITO A	09040	RIDGE	AVE	42R
040	71580 00721 001	CARL A UNRUH	00721	SEFFERT	ST	42R
040	72300 00003 R01	MAHR P & R	00003	SHAWMONT	AVE	42R
040	72300 00020 001	CELLINI DAVID S	00020	SHAWMONT	AVE	42R
040	72300 00446 R01	MC NICHOLS JOHN & JONES	00446	SHAWMONT	AVE	42R
040	72300 00446 001	CYBULSKI JOHN & LINDA	00446	SHAWMONT	AVE	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
040	72300 00448 R01	MARTIN JAMES	00448	SHAWMONT	AVE	42R
040	72300 00548 001	ANGELO JOSEPH & E	00548	SHAWMONT	AVE	42R
040	72300 00580 001	WILLIAM J MILLER ETUX	00580	SHAWMONT	AVE	42R
040	73720 00224 001	STAUFENBERG R	00224	SPRING	LA	42R
040	73720 00224 002	STAUFENBERG R	00224	SPRING	LA	42R
040	73720 00540 001	DOUGHERTY JAMES E	00540	SPRING	LA	42R
040	73720 00550 001	RUCH MARIE	00550	SPRING	LA	42R
040	73720 00570 001	F & I HENDRY	00570	SPRING	LA	42R
040	73720 00644 001	SMITH ROBERT	00644	SPRING	LA	42R
040	73720 00646 001	E & F JACOB	00646	SPRING	LA	42R
040	73720 00648 001	MANUOLA FRANCES C	00648	SPRING	LA	42R
040	73720 00650 001	EDWARD WALSACK	00650	SPRING	LA	42R
040	73720 00706 001	R FERGUSON ETAL	00706	SPRING	LA	42R
040	73720 00712 001	W M & M L BARNES	00712	SPRING	LA	42Z
040	73720 00730 001	F & E BLAIR	00730	SPRING	LA	42Z
040	73720 00732 001	H & M HARTLEBEN	00732	SPRING	LA	42R
040	75440 00109 001	VITELLI PETER	00109	SUMMIT	AVE	42R
040	75460 00445 001	M NOVAK	00445	SUMMIT	AVE	42R
040	75460 00447 001	WHEELER WILLIAM & J	00447	SUMMIT	AVE	42R
040	75460 00449 001	W GATES ETUX	00449	SUMMIT	AVE	42R
040	75460 00451 001	MONAHAN DAVID & ANNA	00451	SUMMIT	AVE	42R
040	75460 00453 001	E & F SORENSEN	00453	SUMMIT	AVE	42R
040	75460 00455 001	WASHLICK JOSEPH	00455	SUMMIT	AVE	42R
040	75460 00459 001	W & B OTTINGER	00459	SUMMIT	AVE	42R
040	75460 00461 001	MC GILL JOSEPH	00461	SUMMIT	AVE	42R
040	75460 00463 001	SMITH ELEANOR	00463	SUMMIT	AVE	42R
040	75460 00465 001	VINCENT G GRECO	00465	SUMMIT	AVE	42R
040	75460 00467 001	ZYSK FRANCIS & LORRAINE	00467	SUMMIT	AVE	42R
040	75460 00469 001	BROMMER JOYCE	00469	SUMMIT	AVE	42R
040	75460 00479 001	ALGIERI VINCENT	00479	SUMMIT	AVE	42R
040	75460 00493 001	G & M DALICANDRO	00493	SUMMIT	AVE	42R
040	75460 00495 001	KOBIE WILLIAM F	00495	SUMMIT	AVE	42R
040	75460 00496 001	WERTZ MARTHA	00496	SUMMIT	AVE	42R
040	75460 00497 001	BEAR RUTH	00497	SUMMIT	AVE	42R
040	75460 00630 001	TIERNEY MILTON C	00630	SUMMIT	AVE	42R
040	75460 00635 001	F A GIOVANNI ETUX	00635	SUMMIT	AVE	42R
040	75460 00637 001	G W & H MORLEY	00637	SUMMIT	AVE	42R
040	75460 00638 001	R M CARTER ETUX	00638	SUMMIT	AVE	42R
040	75460 00653 001	HUDAK GEORGE	00653	SUMMIT	AVE	42Z
040	75460 00662 001	TIERNEY KEVIN	00662	SUMMIT	AVE	42R
040	75460 00670 001	D AMORE JOSEPH & J	00670	SUMMIT	AVE	42R
040	75460 00680 001	RICHARD MANGINE	00680	SUMMIT	AVE	42R
040	75460 00682 001	MANGINE RICHARD A	00682	SUMMIT	AVE	42R
040	75460 00683 001	CARNEY HUGH	00683	SUMMIT	AVE	42R
040	75460 00686 001	J & M MANCINI	00686	SUMMIT	AVE	42R
040	75460 00689 001	S D CAPECE & M	00689	SUMMIT	AVE	42R
040	75460 00696 001	RAVERT CHESTER & C	00696	SUMMIT	AVE	42R
040	75460 00717 001	BESSO SAMUEL A ETUX	00717	SUMMIT	AVE	42R
040	75460 00719 001	C J MC MEANS & B	00719	SUMMIT	AVE	42R
040	75460 00721 001	CARNEY MARK B	00721	SUMMIT	AVE	42R
040	75460 00723 001	RICHARD R & M R BURKE	00723	SUMMIT	AVE	42R
040	75460 00727 001	CLAYTON NORMAN & M	00727	SUMMIT	AVE	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
040	75470 00001 001	CHARLES G SIMPSON	00001		SUMMIT PL	42R
040	75470 00002 001	MISSIMER MARGARET	00002		SUMMIT PL	42R
040	75470 00006 001	OTTO REICHERT FACILITIES	00006		SUMMIT PL	42R
040	75470 00010 001	ANDERSON ADD & D	00010		SUMMIT PL	42R
040	75540 00721 001	ATKINSON CHARLES	00721		SUNSET AVE	42R
040	75540 00760 001	LOVETT RAYMOND & V	00760		SUNSET AVE	42R
040	75540 00764 001	KENT LESTER & L	00764		SUNSET AVE	42R
040	84060 08735 001	DECKER JOHN	08735		WISSAHICKON AVE	42R
040	84060 08801 001	GILL JOHN & T	08801		WISSAHICKON AVE	42R
041	38460 07103 001	S HEINEMAN	07103		GREENE ST	42Z
041	38460 07125 001	B K ZERN ETAL	07125		GREENE ST	42Z
041	38460 07203 001	WAGNER DANIEL	07203		GREENE ST	42Z
041	41240 07504 001	CUTLER ERNEST & J	07504		HAVERFORD AVE	42R
041	41240 07508 001	C B L ASSOCIATES	07508		HAVERFORD AVE	42R
042	11080 00479 001	GRUVER CHARLES	00479	W	ABBOTTSFORD AVE	42R
049	38340 03349 001	CSX TRANS 23616	03349		GRAYS FERRY AVE	42Z
049	81180 00423 001	NOPPER CARLTON GENE	00423	W	WALNUT LA	42R
049	81180 00431 001	TEBBEL JANET	00431	W	WALNUT LA	42R
050	21560 00854 001	BANNAN JOHN 3RD	00854		CARPENTER LA	42R
050	22040 03541 001	M SLABEK & E	03541		CEDAR ST	42R
050	23920 00331 001	F A & K L MC CORD	00331	W	CLIVEDEN ST	42R
050	23920 00333 001	DERRICUTT CYNTHIA	00333	W	CLIVEDEN ST	42R
050	23920 00339 001	KEARNS MARTHA	00339	W	CLIVEDEN ST	42R
050	64480 00647 001	FRENKEL DDUGLAS N & M	00647	W	PHIL ELLENA ST	42Z
050	82620 00606 001	KROMER JOHN	00606		WESTVIEW AVE	42R
051	28640 02809 001	G J MONTANARO ETUX	02809		DISSTON ST	42R
051	28640 02811 001	SILVERMAN BETTY	02811		DISSTON ST	42R
051	63680 00315 001	D & E WILSON	00315		PELHAM RD	42R
052	21560 00139 001	MOGUL S STACY	00139		CARPENTER LA	42R
052	37100 00630 001	BERG JODY L	00630		GLEN ECHO RD	42R
052	54640 07329 001	FRUMKIN HOWARD ETUX	07329		MC CALLUM ST	42Z
052	57480 00633 001	TIETZ GERALD & P	00633	N	MT PLEASANT RD	42R
052	57480 00645 001	BROWNSTEIN KENNETH & L	00645	N	MT PLEASANT RD	42R
052	57480 00701 001	S FEINBERG & H R	00701	N	MT PLEASANT RD	42Z
052	57480 00707 001	NIXON JOHN & DEBORAH	00707	N	MT PLEASANT RD	42Z
052	57480 00725 001	G & A GREENE	00725	N	MT PLEASANT RD	42R
052	57480 00827 001	KOZART DAVID	00827	N	MT PLEASANT RD	42R
053	12160 00447 001	BRAUM HELEN B	00447	W	ALLENS LA	42Z
053	12160 00508 001	R & M MAC GREGOR	00508	W	ALLENS LA	42Z
053	12160 00624 001	W & M HANGLEY	00624	W	ALLENS LA	42Z
053	12160 00701 001	YANOFF MYRON	00701	W	ALLENS LA	42Z
053	12160 00714 001	W H MILLAR & A GLENNA	00714	W	ALLENS LA	42Z
053	12160 00747 001	I MELVILLE STEIN	00747	W	ALLENS LA	42R
053	12160 00749 001	WALTER E GILBERT	00749	W	ALLENS LA	42R
053	12160 00755 001	MALONE DANIEL & E	00755	W	ALLENS LA	42R
053	12160 00777 001	WARNER MARY A	00777	W	ALLENS LA	42R
053	12160 00801 001	LIVEZEY JOSEPH & B	00801	W	ALLENS LA	42R
053	22700 07713 001	JAMES MC SWEENEY ETUX	07713		CHEROKEE ST	42R
053	57420 00618 001	SYIEK JOSEPH A	00618	W	MT AIRY AVE	42Z
053	57420 00619 001	DANNENBERG JAMES	00619	W	MT AIRY AVE	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
053	57420 00706 001	S & E MORRIS	00706 W	MT AIRY	AVE	42Z
053	57420 00707 001	J D WILSON ETUX	00707 W	MT AIRY	AVE	42R
053	57420 00714 001	DONALD SCOTT	00714 W	MT AIRY	AVE	42Z
053	72580 07201 001	DUFFY THOMAS HUNT	07201	SHERMAN	ST	42Z
053	74080 00600 001	JOHN & S WILSON	00600	ST GEORGES	RD	42R
053	74080 00615 001	LOUIS HILL	00615	ST GEORGES	RD	42Z
053	74080 00620 001	RANDAL KAREN	00620	ST GEORGES	RD	42R
053	74080 00626 001	WELLENBACH BURTON &S	00626	ST GEORGES	RD	42Z
053	74080 00627 001	ROHRER E WARREN	00627	ST GEORGES	RD	42Z
053	74080 00701 001	BINSWANGER F G 3RD & S	00701	ST GEORGES	RD	42R
053	74080 00702 001	C L ROBINSON	00702	ST GEORGES	RD	42R
053	74080 00707 001	CUSTER RICHARD D	00707	ST GEORGES	RD	42R
053	74080 00713 001	JOHN R PADUA ESQ	00713	ST GEORGES	RD	42R
053	74080 00715 001	ATKINSON BARBARA & G	00715	ST GEORGES	RD	42R
053	74080 00740 001	D & V PEARCY	00740	ST GEORGES	RD	42R
053	74080 00742 001	DEWART DOROTHY	00742	ST GEORGES	RD	42R
053	74080 00752 001	MANDEL RICHARD & P	00752	ST GEORGES	RD	42R
053	74080 00756 001	LELAND WILSON	00756	ST GEORGES	RD	42R
053	74080 00758 001	ARDIETA LEONARD & A	00758	ST GEORGES	RD	42R
053	81880 07101 001	WENDELL & C BAKER	07101	WAYNE	AVE	42Z
053	81880 07219 001	B & H GOODHEART	07219	WAYNE	AVE	42R
054	22700 07701 001	BROGAN ROBERT	07701	CHEROKEE	ST	42R
054	22700 07705 001	MARTIN RICHARD	07705	CHEROKEE	ST	42R
054	22700 07940 001	P FARNUM	07940	CHEROKEE	ST	42Z
054	55680 00050 001	ARAI KAZUKUHIKO & YOKO	00050 W	MERMAID	LA	42R
054	55680 00413 001	SHEPPARD WINSTON C & OLIV	00413 W	MERMAID	LA	42R
054	55680 00415 001	B SCHUYLER BRIGGS DEMING	00415 W	MERMAID	LA	42R
054	55680 00504 001	GLICKSTEIN D & L	00504 W	MERMAID	LA	42R
054	55680 00510 001	MALTA S VICTOR & S	00510 W	MERMAID	LA	42R
054	55680 00517 001	E ACHENBACH	00517 W	MERMAID	LA	42R
054	55680 00525 001	KERMAN MYER	00525 W	MERMAID	LA	42R
054	55680 00540 001	SCANLAN ANN E	00540 W	MERMAID	LA	42R
054	55680 00545 001	ALESSANDRONI EUGENE V	00545 W	MERMAID	LA	42R
054	55680 00560 001	UELAND MARK & E	00560 W	MERMAID	LA	42R
054	56980 00430 001	E SAWIN JR ETUX	00430 W	MORELAND	AVE	42R
054	56980 00500 001	BURTON A FLEMING	00500 W	MORELAND	AVE	42R
054	56980 00516 002	BARTON THOMAS III	00516 W	MORELAND	AVE	42R
054	56980 00520 001	SCHMITT CHARLES R	00520 W	MORELAND	AVE	42R
054	56980 00525 001	BUTTERWORTH JANET	00525 W	MORELAND	AVE	42R
054	56980 00528 001	EAST ELLA	00528 W	MORELAND	AVE	42R
054	56980 00530 001	J B VAN DUSEN ETUX	00530 W	MORELAND	AVE	42R
054	56980 00539 001	WILLIAMS GEORGE 3RD	00539 W	MORELAND	AVE	42R
054	56980 00541 001	BUCHHEIT WILLIAM	00541 W	MORELAND	AVE	42R
054	56980 00542 001	JASMINE A L WOODS	00542 W	MORELAND	AVE	42R
054	71740 08319 001	AMROM GEORGE J	08319	SEMINOLE	AVE	42Z
054	71740 08320 001	T & A MORRIS JR	08320	SEMINOLE	AVE	42Z
054	71740 08401 001	G & J FORDE	08401	SEMINOLE	AVE	42Z
054	71740 08415 001	SCHELTER G CRAIG	08415	SEMINOLE	AVE	42Z
054	71740 08515 001	TYSON ANNA	08515	SEMINOLE	AVE	42R
054	71740 08525 001	ENDE JACK & P	08525	SEMINOLE	AVE	42R
054	71740 08605 001	P H WARD 3RD	08605	SEMINOLE	AVE	42R
054	71740 08616 001	OWNER/OCCUPANT	08616	SEMINOLE	AVE	42R

DAY	ACCOUNT	OWNER	ADDRESS	SERVICE
054	71740 08635 001	MC CARTHY FRANCIS	08635 SEMINOLE AVE	42R
054	77400 02545 001	REDEMPTORIST FATHERS	02545 E TIOGA ST	42R
055	36240 00511 001	WEST HARRY & MAI	00511 W GRAVERS LA	42R
055	38240 00605 001	OILKS PARK JR	00605 W GRAVERS LA	42Z
055	42540 00035 001	LIVESAY KEVEN M & K ETAL	00035 W HIGHLAND AVE	42R
055	42540 00309 001	BAUER ROBERT G	00309 W HIGHLAND AVE	42R
055	54980 00118 001	WETHERILL FREDERICK & R	00118 W MEADE ST	42R
055	59100 08707 001	CARTER WILLIAM	08707 NAVAJO RD	42R
055	59100 08709 001	CAVENY WILLIAM	08709 NAVAJO RD	42R
055	59100 08711 001	STEVENS MARY ELLEN	08711 NAVAJO RD	42R
055	68120 00035 001	P RICHARD & L	00035 REX AVE	42R
055	68120 00124 001	J & J SCHAEFER	00124 REX AVE	42R
055	68120 00126 001	D TOOLE JOHN & J	00126 REX AVE	42R
055	68120 00203 001	B C REX	00203 REX AVE	42Z
055	68120 00226 001	TAYLOR LANE	00226 REX AVE	42R
055	68120 00234 001	RETTEW GORDON	00234 REX AVE	42R
055	68120 00239 001	DIVER COLIN S & JOAN M	00239 REX AVE	42R
055	68820 07922 001	A L SALEMMO	07922 ROANOKE ST	42R
055	68820 07924 001	J MC FADDEN	07924 ROANOKE ST	42R
055	72320 08512 001	S & N WILMOT	08512 SHAWNEE ST	42R
055	72320 08514 001	MARTIN CONNORS	08514 SHAWNEE ST	42R
055	72320 08516 001	GOUAK BARRY	08516 SHAWNEE ST	42R
055	72320 08518 001	GALLAGHER ELLEN F	08518 SHAWNEE ST	42R
055	73520 00012 001	RESOVSKY EDWARD M	00012 W SOUTHAMPTON AVE	42R
055	73520 00016 001	C W IRONS & B W	00016 W SOUTHAMPTON AVE	42R
055	73520 00030 001	GALE STEPHEN & B	00030 W SOUTHAMPTON AVE	42R
055	73520 00048 001	B C BROWN	00048 W SOUTHAMPTON AVE	42R
055	73940 00500 001	HALLORAN THOMAS	00500 W SPRINGFIELD AVE	42R
055	73940 00532 001	C & C FRANKLIN	00532 W SPRINGFIELD AVE	42R
055	73940 00540 001	VON MEDIUS SUSAN E	00540 W SPRINGFIELD AVE	42R
055	73940 00544 001	GRATWICK HENRY & ANITA	00544 W SPRINGFIELD AVE	42R
055	73940 00546 001	R BARCLAY KNIGHT	00546 W SPRINGFIELD AVE	42R
055	77620 08807 001	REINSTEIN ROBERT & M	08807 TOWANDA AVE	42R
055	79660 00801 U27	DORAN WILLIAM	00801 VALLEY GREEN RD	42R
055	83480 00055 001	G R & A WALKER	00055 W WILLOW GROVE AVE	42R
056	11160 00400 001	E IRENE REYMANN	00400 E ABINGTON AVE	42R
056	11160 00408 001	STEVENS RICHARD K JR	00408 E ABINGTON AVE	42Z
056	11160 00445 001	FELIX CLAIRE S	00445 E ABINGTON AVE	42R
056	16580 04300 001	HOLY REDEEMER CEMETERY	04300 BELGRADE ST	42R
056	16700 00024 001	V & T CROWN	00024 E BELLS MILL RD	42Z
056	16700 00063 001	JOHN K DOSMOND	00063 E BELLS MILL RD	42R
056	16700 00091 001	ALLISON CRAWFORD & M	00091 E BELLS MILL RD	42R
056	16700 00097 001	LEITZ EDWARD	00097 E BELLS MILL RD	42Z
056	16700 00102 001	J KENNEDY JR ETUX	00102 E BELLS MILL RD	42R
056	16700 00107 001	J L & R FREY	00107 E BELLS MILL RD	42R
056	16720 00030 001	KITTREDGE THOMAS & AMELIA	00030 W BELLS MILL RD	42R
056	17360 00059 001	SEWELL C	00059 BETHLEHEM PK	42R
056	17360 00060 001	SWIACKI W & J	00060 BETHLEHEM PK	42R
056	17360 00071 001	THEODORE G ANDERSON	00071 BETHLEHEM PK	42R
056	17360 00079 001	CARR GEORGE & R	00079 BETHLEHEM PK	42Z
056	17360 00082 001	PERKINS HOLMES	00082 BETHLEHEM PK	42R
056	17360 00084 001	BAXTER JUSTIN M	00084 BETHLEHEM PK	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
056	17360 00085 001	ROBERT M RYAN ETAL	00085	BETHLEHEM	PK	42R
056	17360 00086 001	BRAY ROBERT	00086	BETHLEHEM	PK	42Z
056	17360 00087 001	SWEENEY HELEN C	00087	BETHLEHEM	PK	42R
056	17360 00089 001	G & C APPEL	00089	BETHLEHEM	PK	42R
056	17360 00092 001	BRENNAN ARTHUR JR	00092	BETHLEHEM	PK	42R
056	17360 00094 001	M G FERRINO ETAL	00094	BETHLEHEM	PK	42Z
056	17360 00097 001	EICHLER & MOFFLY INC	00097	BETHLEHEM	PK	42R
056	17360 00105 001	DUBIEL EDWARD A	00105	BETHLEHEM	PK	42R
056	17360 00107 001	EDITH H M WATSON	00107	BETHLEHEM	PK	42R
056	17360 00111 001	PEEK JOHN & M	00111	BETHLEHEM	PK	42R
056	17360 00113 001	H & J ANSEL	00113	BETHLEHEM	PK	42R
056	17360 00115 001	STERN JOHN J	00115	BETHLEHEM	PK	42R
056	17360 00117 001	J ANSEL TR	00117	BETHLEHEM	PK	42R
056	17360 00119 001	MC FADDEN J & M	00119	BETHLEHEM	PK	42R
056	17360 00122 001	JARON DOV & B	00122	BETHLEHEM	PK	42R
056	17360 00123 001	DWYER TIMOTHY F	00123	BETHLEHEM	PK	42R
056	17360 00142 001	STRAWBRIDGE DAVID R	00142	BETHLEHEM	PK	42R
056	17360 00159 001	WORRALL MAE	00159	BETHLEHEM	PK	42R
056	21770 00002 001	LOUIS MARTINI	00002	CARYL	LA	42R
056	22860 00002 001	GALLAGHER ROBERT F & L	00002 E	CHESTNUT HILL	AVE	42Z
056	22860 00018 001	ST PAULS EPISCOPAL CHURCH	00018 E	CHESTNUT HILL	AVE	42R
056	22860 00034 001	MR HUGHES	00034 E	CHESTNUT HILL	AVE	42R
056	22860 00036 001	P HUGHES	00036 E	CHESTNUT HILL	AVE	42R
056	22860 00042 001	WILLIAMS C HARRISON & H	00042 E	CHESTNUT HILL	AVE	42R
056	22860 00043 002	BARRY BLUM ETAL	00043 E	CHESTNUT HILL	AVE	42R
056	22860 00120 001	FOLEY TERRENCE & R	00120 E	CHESTNUT HILL	AVE	42R
056	22860 00122 001	BAUMBACH CLIFFORD 3RD & B	00122 E	CHESTNUT HILL	AVE	42R
056	22860 00124 001	RITTENHOUSE EDWARD JR & L	00124 E	CHESTNUT HILL	AVE	42Z
056	22880 00003 001	PATRICK J CRIMMINS	00003 W	CHESTNUT HILL	AVE	42R
056	22880 00005 001	STERNBERG JONATHAN ETUX	00005 W	CHESTNUT HILL	AVE	42R
056	22880 00007 001	R RECKO	00007 W	CHESTNUT HILL	AVE	42R
056	22880 00117 001	MC GINNIS AGNES	00117 W	CHESTNUT HILL	AVE	42R
056	22880 00121 001	R & R PRICE	00121 W	CHESTNUT HILL	AVE	42R
056	22880 00140 001	GADSDEN CHRISTOPHER H	00140 W	CHESTNUT HILL	AVE	42Z
056	22880 00201 001	PAUL ANTHONY & M	00201 W	CHESTNUT HILL	AVE	42R
056	22880 00202 001	J & C FRIEDMAN	00202 W	CHESTNUT HILL	AVE	42R
056	22880 00204 001	HIESINGER ULRICH & K	00204 W	CHESTNUT HILL	AVE	42R
056	22880 00240 001	MACEACHERN J ETUX	00240 W	CHESTNUT HILL	AVE	42R
056	22880 00422 001	LORD G CRAIG	00422 W	CHESTNUT HILL	AVE	42Z
056	22880 00440 002	HOWE ARTHUR W IV	00440 W	CHESTNUT HILL	AVE	42R
056	22880 00463 001	TISOT ROBERT J	00463 W	CHESTNUT HILL	AVE	42R
056	25680 08838 001	CULP THOMAS C JR	08838	CREFELD	ST	42R
056	25680 08923 001	ANGELO A GUERRINA	08923	CREFELD	ST	42R
056	25680 08925 001	A & M DELLA PORTA	08926	CREFELD	ST	42R
056	25680 09000 001	SOSIN ALLAN	09000	CREFELD	ST	42Z
056	25680 09001 001	W A & S I BRECHT	09001	CREFELD	ST	42R
056	25680 09011 001	LOM FRANK	09011	CREFELD	ST	42R
056	25680 09100 001	DIMELING WILLIAM R	09100	CREFELD	ST	42Z
056	25680 09110 001	ROGERS HILDA	09110	CREFELD	ST	42R
056	25680 09111 001	B MENIN	09111	CREFELD	ST	42R
056	25680 09119 001	WEAVER EUGENE & D	09119	CREFELD	ST	42R
056	36660 09225 001	GAST BEVERLY S	09225	GERMANTOWN	AVE	42R

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056	36660 09253 001	W & L GOOD	09253 GERMANTOWN AVE	42Z
056	36660 09501 001	LOEB JOHN GORDON	09501 GERMANTOWN AVE	42R
056	36660 09517 001	DENNING CHARLES & JULIA	09517 GERMANTOWN AVE	42Z
056	36660 09521 001	CONNOR JOHN & MARY	09521 GERMANTOWN AVE	42R
056	38220 00319 001	LEHR MICHAEL	00319 E GRAVERS LA	42R
056	38425 09135 001	BALDRIDGE BENJAMIN & C	09135 GREEN TREE RD	42R
056	38425 09147 001	GREENBERG LON & B	09147 GREEN TREE RD	42R
056	40300 00015 001	MARTIN JOHN	00015 E HAMPTON RD	42R
056	40320 00004 001	CONRAN JOSEPH	00004 W HAMPTON RD	42R
056	40320 00012 001	SUSANIN JOHN A & N	00012 W HAMPTON RD	42R
056	40320 00015 002	JAMES CAMPBELL	00015 W HAMPTON RD	42R
056	40320 00017 001	LEVINE BEVERLY G	00017 W HAMPTON RD	42R
056	40320 00024 001	HYNDMAN THOMAS M JR	00024 W HAMPTON RD	42R
056	40320 00035 001	POWELL KENNETH J JR & R	00035 W HAMPTON RD	42Z
056	40320 00054 001	COLLINS CARVILLE B & M	00054 W HAMPTON RD	42R
056	40320 00060 001	WEITH G JAMES & JANET	00060 W HAMPTON RD	42R
056	40320 00080 001	BOERICKE CATHERINE C	00080 W HAMPTON RD	42R
056	40320 00095 001	REAL ALBERT R	00095 W HAMPTON RD	42Z
056	40320 00099 001	MC NELIS GEORGE & J	00099 W HAMPTON RD	42R
056	40320 00100 001	U E HEARST ETUX	00100 W HAMPTON RD	42Z
056	42680 00006 001	WOODRUFF CHARLES L	00006 HILLCREST AVE	42Z
056	42680 00044 001	GRIFFIN THOMAS & PATRICIA	00044 HILLCREST AVE	42Z
056	42680 00100 001	B C WATSON ETUX	00100 HILLCREST AVE	42R
056	42680 00154 001	F D & A DU PONT WETHERILL	00154 HILLCREST AVE	42Z
056	42680 00174 001	BINSWANGER DAVID R	00174 HILLCREST AVE	42Z
056	42680 00183 001	WILSON JOHN F III	00183 HILLCREST AVE	42R
056	42680 00185 001	WOOD THEODORE & B	00185 HILLCREST AVE	42R
056	42680 00187 001	POE JOSEPH & FERN	00187 HILLCREST AVE	42R
056	42680 00189 001	R & E MACKOWIAK	00189 HILLCREST AVE	42R
056	47520 02718 001	JOSEPH BUTLER	02718 KERBAUGH ST	42R
056	49340 00011 001	BAXTER JOSEPH	00011 LAUGHLIN LA	42R
056	49340 00014 001	BARBARA DUNCOMBE LANG	00014 LAUGHLIN LA	42R
056	49340 00015 001	DR GEORGE & A SPAETH	00015 LAUGHLIN LA	42Z
056	49340 00019 001	IRWIN HENRY & C	00019 LAUGHLIN LA	42R
056	52180 00194 001	BRIOGER MARY A	00194 LYNNEBROOK LA	42R
056	52180 00197 001	ROSS RICHARD S JR	00197 LYNNEBROOK LA	42R
056	52180 00200 001	STEEG JAMES	00200 LYNNEBROOK LA	42Z
056	52180 00201 001	KORMAN JOHN P	00201 LYNNEBROOK LA	42R
056	52180 00209 001	YOUNG ROBERT & B	00209 LYNNEBROOK LA	42Z
056	52180 00210 001	CAROLYN HAYWOOD	00210 LYNNEBROOK LA	42R
056	52180 00211 001	S W PEARSON JR	00211 LYNNEBROOK LA	42R
056	52180 00213 001	BENNETT EUGENIA	00213 LYNNEBROOK LA	42R
056	53920 09500 001	OSWALD JOHN & R	09500 MARSTAN RD	42R
056	53920 09506 001	CLEMENT U CLARKE	09506 MARSTAN RD	42R
056	55060 09402 001	MURRAY & F DOLFMAN	09402 MEADOWBROOK AVE	42R
056	55060 09410 001	KELLY WILLIS	09410 MEADOWBROOK AVE	42Z
056	55060 09419 001	JOHN E FLETCHER	09419 MEADOWBROOK AVE	42R
056	55060 09421 001	P & D UTSINGER	09421 MEADOWBROOK AVE	42R
056	55060 09423 001	P C SHEPARD ETUX	09423 MEADOWBROOK AVE	42R
056	55060 09425 001	SLIVKA WILLIAM A	09425 MEADOWBROOK AVE	42Z
056	55060 09501 001	SWOPE C	09501 MEADOWBROOK AVE	42Z
056	55060 09503 001	F G LASSNER ETUX	09503 MEADOWBROOK AVE	42Z

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
056	59700 00016 001	WALTER T DWYER JR ETAL	00016	NEWTON	ST	42R
056	59700 00051 001	DYER RANDALL ALAN	00051	NEWTON	ST	42R
056	59700 00100 001	SHULDINER R & FRANK C	00100	NEWTON	ST	42Z
056	60060 00001 001	EIGHLER DAVID	00001	NORMAN	LA	42R
056	60060 00002 001	MEIGS JOHN F ETAL	00002	NORMAN	LA	42Z
056	60060 00008 001	JAMES G SCHMIDT	00008	NORMAN	LA	42R
056	60240 08813 001	LEEGARD DONNA F	08813	NORWOOD	AVE	42R
056	60240 08819 002	JAVERS RONALD	08819	NORWOOD	AVE	42Z
056	60240 08827 001	KRIEDMAN TERRY F ETUX	08827	NORWOOD	AVE	42R
056	60240 08833 001	COHEE ELIZABETH	08833	NORWOOD	AVE	42R
056	60240 08839 001	P J & V H SMITH	08839	NORWOOD	AVE	42R
056	60240 08843 001	E M DAVID ETUX	08843	NORWOOD	AVE	42R
056	60240 08845 001	T & L SHANNON	08845	NORWOOD	AVE	42R
056	60240 08862 001	LEE BARBARA K	08862	NORWOOD	AVE	42R
056	60240 08864 001	BOLAND MARY M	08864	NORWOOD	AVE	42R
056	60240 08866 001	RYAN DAVID & RISE	08866	NORWOOD	AVE	42R
056	60240 08874 001	ROBERT O LEES ETUX	08874	NORWOOD	AVE	42R
056	60240 08878 001	MORROW ROBERT	08878	NORWOOD	AVE	42R
056	60240 08882 001	LEE CHARLES & C	08882	NORWOOD	AVE	42R
056	65820 08431 001	DAVID N & S H GOODNER	08431	PROSPECT	AVE	42R
056	65820 08610 001	L R MAYER JR	08610	PROSPECT	AVE	42R
056	65820 08711 001	DAY JOHN B & S	08711	PROSPECT	AVE	42R
056	65820 08714 001	BROWN THOMAS & M	08714	PROSPECT	AVE	42R
056	65820 08718 001	BULLITT RUSSELL THAYER	08718	PROSPECT	AVE	42R
056	74660 08414 001	OROURKE T B ETUX	08414	STENTON	AVE	42R
056	74660 08512 001	G & M RAYBORN	08512	STENTON	AVE	42R
056	74660 08720 001	MC MONAGLE WILLIAM & M	08720	STENTON	AVE	42R
056	74660 08730 001	HALE DAVID A	08730	STENTON	AVE	42R
056	74660 08740 001	ANDERSON GEORGE	08740	STENTON	AVE	42R
056	74660 08840 001	GIUFFRIDA MATTHEW A	08840	STENTON	AVE	42Z
056	74680 09200 001	DINAN JOHN E	09200	STENTON	AVE	42R
056	74660 09300 001	DORISS DAVID	09300	STENTON	AVE	42R
056	74660 09312 001	F S CLAGHORN & K T	09312	STENTON	AVE	42Z
056	75440 00008 001	PIE M & BRUNO J	00008	SUMMIT	AVE	42R
056	75440 00031 001	MC DERMOTT JAMES	00031	SUMMIT	AVE	42R
056	75440 00035 001	MC DERMOTT JAMES	00035	SUMMIT	AVE	42R
056	75440 00037 001	JULES & HELEN H RIND	00037	SUMMIT	AVE	42R
056	75440 00039 001	WALLIN FRANKLIN BOGUE	00039	SUMMIT	AVE	42Z
056	75440 00046 001	SMART ROBERT B	00046	SUMMIT	AVE	42Z
056	75440 00049 001	TUTEIN DEXTER	00049	SUMMIT	AVE	42R
056	75440 00052 001	R T DOYLE JR	00052	SUMMIT	AVE	42R
056	75440 00054 001	ALMSTEAD KARL F	00054	SUMMIT	AVE	42R
056	75440 00100 001	RUSSELL H SHAFFER	00100	SUMMIT	AVE	42Z
056	75440 00101 001	SABOL PAUL	00101	SUMMIT	AVE	42R
056	75440 00105 001	FLYNN D & F	00105	SUMMIT	AVE	42R
056	75560 00004 R01	RUTHRAUFF WILBUR	00004 E	SUNSET	AVE	42R
056	75560 00004 001	MILLER KENT	00004 E	SUNSET	AVE	42R
056	75560 00020 001	C HAUSSERMAN	00020 E	SUNSET	AVE	42R
056	75580 00025 001	LOWRY WILLIAM C IV	00025 W	SUNSET	AVE	42Z
056	75580 00029 001	WILLIAMS LOUISE	00029 W	SUNSET	AVE	42R
056	75580 00075 001	POPKY GEORGE L ETUX ETAL	00075 W	SUNSET	AVE	42R
056	79680 00011 001	O MALLEY MICHAEL & G	00011	VALLEY VIEW	RD	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
056	79680 00013 001	CLAIR JAMES HENRY	00013		VALLEY VIEW RD	42R
056	81760 00002 001	HAINES ANNA MARIA	00002		WATERMAN AVE	42R
056	82780 09500 001	RESNIK ALAN M	09500		WHEEL PUMP LA	42Z
056	82780 09501 001	DEVENNEY JOHN E	09501		WHEEL PUMP LA	42Z
056	82780 09502 001	MC CALL J BARTOW & L	09502		WHEEL PUMP LA	42Z
056	82780 09505 001	M L & M H BREIDEN	09505		WHEEL PUMP LA	42Z
056	82780 09506 001	HARBISON JEFFREY T	09506		WHEEL PUMP LA	42R
056	82780 09507 001	RAMBO JOSEPH	09507		WHEEL PUMP LA	42Z
056	82780 09508 001	DR DONALD RHOADS ETUX	09508		WHEEL PUMP LA	42R
056	82780 09509 001	GREENWOOD THOMAS S JR	09509		WHEEL PUMP LA	42Z
056	82780 09511 001	HANKIN ARTHUR W	09511		WHEEL PUMP LA	42Z
056	82920 00206 001	R L & A LEININGER	00206		WHITEMARSH ST	42Z
056	82920 00210 001	DAVID G DAVIS ETUX	00210		WHITEMARSH ST	42Z
056	82920 00214 001	INGRAHAM N	00214		WHITEMARSH ST	42Z
057	51440 00062 001	M ROBIN	00062	E	LOGAN ST	42R
058	41560 02901 001	DOLKIEWICZ LEONARD G JR	02901		HEDLEY ST	42R
060	11280 04619 001	THELMA M EASTERBROOK	04619		ADAMS AVE	42R
060	16300 05602 001	JOHN W PATTERSON	05602		BAYNTON ST	42R
060	81880 05522 001	PAULMIER LOUIS ETAL	05522		OSCEOLA ST	42R
061	28660 06400 001	MAGNOLIA CEMETERY CO	06400		DITMAN ST	42Z
061	51360 00724 001	MYERS HUGH & VIRGINIA	00724		LOCUST AVE	42R
063	88410 01105 001	BELL FUEL CORP	01105	S	31ST ST	42R
066	39920 00826 001	R & R DEHAAN	00826	E	HAINES ST	42R
067	46160 01913 001	B CONDRAN	01913		JOHN ST	42R
067	78060 00800 001	JONES ALEXANDER	00800	E	TULPEHOCKEN ST	42R
068	45820 07326 001	KOROLISHIN THEODORE & D	07326		JAMES ST	42R
068	60240 02016 001	IANNELLI RONALD	02016	W	PASSYUNK AVE	42R
068	65360 02737 001	J ZHIMECK	02737		PORTER ST	42R
068	84100 06832 001	HLADCZUK JOHN	06832		WISSINOMING ST	42R
069	16920 04806 001	CARSON MARY	04806		BENNER ST	42R
069	28320 05130 001	NEWMAN & CO	05130		DEVEREAUX AVE	42R
069	36460 02127 001	PARTRIDGE WILLIAM ETUX	02127		GEARY ST	42R
069	43420 02128 001	MC CULLOUGH JOSEPH M	02128		HOMESTEAD ST	42R
070	13080 06118 001	FARMER SHARON	06118		ARDLEIGH ST	42R
070	13080 06130 001	SAND RICHARD & K	06130		ARDLEIGH ST	42Z
070	18620 06119 001	COXE SPENCER	06119		BOYER ST	42Z
070	18620 06121 001	SCATTERGOOD T & FLYNN J	06121		BOYER ST	42Z
070	18620 06123 001	CHRISTOPHER EVANS	06123		BOYER ST	42R
070	64080 03313 001	PRZYUEMSKI STANLEY & E	03313		PENROSE AVE	42R
070	64080 03315 001	WESTENBERGER WILLIAM ETAL	03315		PENROSE AVE	42R
071	29720 01204 001	NELSON BARBARA J	01204	E	DUVAL ST	42R
072	88220 03215 001	FAITH UNITED METH CHURCH	03215	S	22ND ST	42R
072	88220 03225 001	R & L WESTENBERGER	03225	S	22ND ST	42R
074	88180 03319 001	CALVARY TEMPLE OF PHILA	03319	S	20TH ST	42R
075	18620 07129 001	WESTED WILLIAM	07129		BOYER ST	42R
075	54900 04415 001	VENEZIALE GEORGE	04415		MC MENAMY ST	42R
076	12560 06919 001	HART CHARLES I & D	06919		ANDERSON ST	42R
076	12560 06919 002	HART CHARLES I & D	06919		ANDERSON ST	42R
076	74660 06910 001	F G YEISER ETUX	06910		STENTON AVE	42R
077	31960 08167 001	D V COOK	08167		ERDRICK ST	42R
077	31960 08163 001	SYLVIA AYCOX ETUX	08163		ERDRICK ST	42R
077	43280 04357 002	BROWNING EVELYN	04357		HOLMESBURG AVE	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
077	43280 04357 003	BROWNING EVELYN	04357		HOLMESBURG AVE	42R
077	81020 08235 001	CARMAN WILLIAM & D	08235		WALKER ST	42R
077	81020 08236 001	MARZULLI VINCENT	08236		WALKER ST	42R
077	81020 08337 001	COLOSIMO JOSEPH	08337		WALKER ST	42R
077	81020 08339 001	SENBERTRANO RONALO & V	08339		WALKER ST	42R
078	13080 07430 001	ROBINSON JAMES	07430		AROLEIGH ST	42R
078	13100 04606 001	LALLY EILEEN	04606		ARENDELL AVE	42R
078	13100 05203 001	J & A KELLY	05203		ARENDELL AVE	42R
078	13500 04829 001	GAROFALO JOSEPH	04829		ASHBURNER ST	42R
078	25260 08300 001	MARKS JOHN	08300		COTTAGE ST	42R
078	25260 08330 001	BOYO GARY	08330		COTTAGE ST	42R
078	37860 00419 001	THOMPSON JOHN JR	00419	E	GOWEN AVE	42Z
078	41580 09232 001	ANTHONY J CARBONE	09232		HEGERMAN ST	42R
078	56180 04622 002	CARR ARLENE	04622		MILLETT ST	42R
078	77600 09424 001	ZOLTEK S N	09424		TORRESDALE AVE	42R
078	78020 09407 001	FAGAN JAMES JR	09407		TULIP ST	42R
078	78020 09501 001	THEUER JOHN H	09501		TULIP ST	42R
078	78020 09543 001	RAYMOND J KEOUGH	09543		TULIP ST	42R
079	13080 07801 R01	O GIACOMELLI & E	07801		ARDLEIGH ST	42R
079	14000 04721 001	FIEDLER JEFFREY	04721		AUBREY AVE	42R
079	14000 04724 001	RUSSELL TUCCI	04724		AUBREY AVE	42R
079	14000 04803 001	H A & M MOYER	04803		AUBREY AVE	42R
079	14000 04810 001	T R FISHER & F S	04810		AUBREY AVE	42R
079	24900 04740 001	HARTMAN WAYNE	04740		CONVENT AVE	42R
079	26020 08019 001	WOLFE JOSEPH	08019		CRITTENDEN ST	42R
079	26020 08036 001	DI PIETRO PAUL & E	08036		CRITTENDEN ST	42R
079	26020 08038 001	GUNN WALTER & B	08038		CRITTENDEN ST	42R
079	30320 09201 001	ENGLISH INC	09201		EADOM ST	42R
079	38120 04914 001	HORCHLER DORA	04914		GRANT AVE	42R
079	45820 09307 001	STEINER HERMAN	09307		JAMES ST	42R
079	50840 04993 001	F A DAVIES	04993		LINDEN AVE	42R
079	50840 04995 001	W F BRINKMAN ETUX	04995		LINDEN AVE	42R
079	55340 09217 001	MILLER MARYANN & S	09217		MELROSE ST	42R
079	55340 09227 001	SAUCHAK SAMUEL & C	09227		MELROSE ST	42R
079	63580 04708 001	THOMPSON WILLIAM	04708		PEARSON AVE	42R
079	63580 04721 001	SEKOLA E	04721		PEARSON AVE	42R
079	76600 09304 001	MC GOWAN WILLIAM	09304		TACONY ST	42R
079	76600 09306 001	MC GOWAN WILLIAM	09306		TACONY ST	42R
079	76600 09334 001	WILLIAM & L LEUPOLD	09334		TACONY ST	42R
079	76600 09340 001	RUFF MARTIN & RUTHANNE	09340		TACONY ST	42R
079	76600 09416 R01	JOWITT & ROGERS CO	09416		TACONY ST	42R
079	76600 09416 001	KENNETH L YOUNG	09416		TACONY ST	42R
079	76600 09515 001	L KOLODZIEJSKI	09515		TACONY ST	42R
079	76600 09528 001	DITROIA FREDERICK	09528		TACONY ST	42R
079	76600 09616 001	LISOWSKI WALTER	09616		TACONY ST	42R
079	76600 09620 001	APICE ANTHONY & MARY	09620		TACONY ST	42R
079	79820 09236 001	JAMES J MC KAY	09236		VANDIKE ST	42R
079	83460 00198 001	UPRIGHT CARMELLA	00198	E	WILLOW GROVE AVE	42R
079	83460 00401 001	BROSS WALTER & L	00401	E	WILLOW GROVE AVE	42R
079	83880 07727 001	TERRINO J & A	07727		WINSTON RD	42R
079	83880 07733 001	MARCOLINA BASIL & C	07733		WINSTON RD	42R
079	84100 09630 001	APICE JOSEPH & JULIA	09630		WISSINOMING ST	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
079	84100 09640 001	FINAN A T ETUX	09640		WISSINOMING ST	42R
080	25780 08043 001	B & G PLIZAK	08043		CRESCO AVE	42R
080	36280 03321 001	ADOMAITIS JOHN & R	03321		FULLER ST	42R
080	68180 03213 001	CLIFT GLORIA ANN	03213		RHAWN ST	42R
080	68180 03221 001	FLEMING DAVID K JR	03221		RHAWN ST	42R
080	68180 03235 001	GRIEGEL EDWARD TR	03235		RHAWN ST	42R
082	50820 08720 D01	LUBRICATION ENGINEERS INC	08720		LINDBERGH BLV	42R
083	11240 00402 001	HANNON MALLY F	00402		ACKER ST	42R
083	12440 06618 001	PAUL A LADDEN	06618	N	AMERICAN ST	42R
083	33240 06301 001	SCHEIDER NORMAN E	06301	N	FAIRHILL ST	42R
083	33240 06316 001	NGHAT KHAI	06316	N	FAIRHILL ST	42R
083	87830 05324 001	BROWN BARBARA	05324	N	02ND ST	42R
083	87830 06600 001	G & D BEZPALKO	06600	N	02ND ST	42R
083	87870 06601 001	JONES VIVIANT W	06601	N	04TH ST	42R
083	87890 06302 001	BEZUBIAK WILLIAM T	06302	N	05TH ST	42R
084	34980 06808 001	PHILA EXTRACT CO INC	06808	N	FRANKLIN ST	42R
084	34980 06809 001	GILBERT DRUMHEISER	06809	N	FRANKLIN ST	42R
084	34980 06811 001	SOMERS JOHN & MARGARET	06811	N	FRANKLIN ST	42R
084	34980 06814 001	WRIGHT EDMUND M JR ETAL	06814	N	FRANKLIN ST	42R
084	34980 06819 001	WIDMAN ALBERT	06819	N	FRANKLIN ST	42R
084	34980 06823 001	ARSTE K & V	06823	N	FRANKLIN ST	42R
084	34980 06827 001	KING MORRIS M	06827	N	FRANKLIN ST	42R
084	79940 06832 001	DAVID FREEMAN	06832		VERBENA AVE	42R
084	87870 05215 001	COHEN JERRY	05215	N	04TH ST	42R
084	87870 05223 001	TARTAGLIONE ANTHONY	05223	N	04TH ST	42R
084	87910 06329 001	PROCTOR RICHARD	06329	N	06TH ST	42Z
084	87970 06838 001	ELI WEISMAN	06838	N	09TH ST	42Z
084	88010 06712 001	SCHAFFER JOHN C.	06712	N	11TH ST	42Z
085	39900 01307 001	MC CALL BARRY & R	01307		HAINES ST	42R
085	39900 01309 001	BAKER ANTHONY & D	01309		HAINES ST	42R
085	39900 01311 001	KEIPER VIOLET	01311		HAINES ST	42R
085	88070 06898 D02	NORTHWOOD CEMETERY CO	06898	N	15TH ST	42Z
085	88070 06898 D03	NORTHWOOD CEMETARY CO	06898	N	15TH ST	42R
087	31200 00633 001	BARBER FRANCES	00633		ELKINS AVE	42R
087	35240 07907 001	CHIFFENS DANIEL	07907		FRONTENAC ST	42R
087	53860 05025 001	MASLUK MICHAEL & J	05025	N	MARSHALL ST	42R
087	53860 05029 001	GREGORY A	05029	N	MARSHALL ST	42R
087	53860 05041 001	JAKUBISZYN JOSEPH	05041	N	MARSHALL ST	42R
089	33860 08359 001	J C & H V SHAFER	08359		FERNDALE ST	42R
090	62080 07844 002	FOX ROBERT & BRAD	07844		OXFORD AVE	42R
092	35280 01740 001	LEHOTSKY PAUL	01740		FULLER ST	42R
094	23520 00201 001	FRANK RIEPEN ETAL	00201	E	CLARKSON AVE	42Z
094	72520 01324 001	RANIERI& ANGELA GUILIO	01324		SHELMIRE AVE	42R
096	22320 00737 001	P HOENISCH	00737		CHANDLER ST	42R
098	30540 01043 D01	EASTON RD 921FT	01043		EASTON RD	42R
098	50300 08205 001	COTTER DAVID F	08205		LEON ST	42R
099	13440 00806 001	W HALL ETUX	00806		ASBURY TER	42R
099	13440 00812 001	YANNELLA PHILIP R	00812		ASBURY TER	42R
099	13440 00818 001	J & B TABACHNICK	00818		ASBURY TER	42Z
099	13440 00824 001	G & B GOLDSMITH	00824		ASBURY TER	42R
099	13440 00828 001	HARMAN ELIZABETH P ETAL	00828		ASBURY TER	42R
099	13440 00832 001	REICHSTEIN ROSALIND L	00832		ASBURY TER	42R

DAY	ACCOUNT	OWNER	ADDRESS				SERVICE
099	13440 00840 001	SKLEANAR JANET	00840		ASBURY	TER	42Z
099	22620 00760 001	RUBIN JACOB	00760	W	CHELTENHAM	AVE	42R
099	22620 00770 001	RUDAKEVYCH EVHEN	00770	W	CHELTENHAM	AVE	42Z
099	22620 01130 001	L & V DOW	01130	W	CHELTENHAM	AVE	42Z
099	22620 01332 001	DISHLER SAUL ETUX	01332	W	CHELTENHAM	AVE	42R
099	60920 00603 001	FELTON VINCENT & GAIL	00603		OAK LANE	AVE	42Z
099	60920 00902 001	LEVITT JOEL & B	00902		OAK LANE	AVE	42Z
099	60920 01008 001	ST MARTINS CHURCH	01008		OAK LANE	AVE	42Z
099	60920 01015 001	J M DOMANICO ETAL	01015		OAK LANE	AVE	42Z
099	60920 01027 001	SOBOL MINNIE & N	01027		OAK LANE	AVE	42Z
099	89280 00827 001	ROBINSON RAY & B	00827	W	69TH	AVE	42Z
099	89280 00902 001	H L & R A JOHNSON JR	00902	W	69TH	AVE	42Z
099	89310 01203 001	CEPHAS JAMES A & E	01203	W	70TH	AVE	42Z
100	17100 02004 001	GAYDOS HENRY THOMAS	02004		BERGEN	ST	42R
100	89140 01020 001	BEY CLAUDAS & S	01020	W	65TH	AVE	42R
100	89180 01034 001	F J SISTRUNK ETUX	01034	W	66TH	AVE	42R
101	55140 00705 001	SISTERS HOLY REDEEMER	00705		MEDARY	AVE	42Z
102	22800 01900 001	PA COMMONWEALTH OF DOT	01900		CHESTNUT	LA	42R
102	22800 01908 D03	PA COMMONWEALTH OF DOT	01908		CHESTNUT	LA	42Z
102	42740 09403 001	IANNELLI LEONARD J &	09403		HILSPACH	ST	42R
102	47920 00722 001	BEZUSHKO GEORGE J	00722		KENILWORTH	AVE	42Z
102	54300 09125 001	WEBER D	09125		MATHER	ST	42R
102	61186 09341 001	ALTIMARI BROS INC	09341		OLD BUSTLETON	AVE	42R
103	18040 09119 D01	GREENBERG FREDAVID	09119		BLUE GRASS	RD	42R
103	18040 09200 001	OLDHAM JAMES	09200		BLUE GRASS	RD	42R
103	38760 02199 D31	GREENBERG F & KAPLAN A	02199		GREGG	AVE	42R
103	38760 02199 D37	GREENBERG & KAPLAN	02199		GREGG	AVE	42R
103	38760 02199 D97	KRAVITZ HARRIET	02199		GREGG	AVE	42R
103	69100 08250 001	WEATHERSBY ANTHONY	08250		ROONEY	ST	42R
103	89040 03275 001	ALFANO H P	03275	S	61ST	ST	42R
104	13720 08810 001	EASLEY LENA	08810		ASHTON	RD	42R
104	13720 09216 001	LESLIE & E BENDER	09216		ASHTON	RD	42R
104	63240 06143 001	DALESSANDRO ANGELO	06143	W	PASSYUNK	AVE	42R
104	63240 06204 001	MANCINI ARMAND & C	06204	W	PASSYUNK	AVE	42R
104	63240 06300 001	ATLANTIC REFINERY CO	06300	W	PASSYUNK	AVE	42R
104	63240 06301 001	ALFANO HENRY F & J	06301	W	PASSYUNK	AVE	42R
104	83420 03400 001	ROEDELL G	03400		WILLITS	RD	42Z
104	83420 03402 D01	J ROEDELL	03402		WILLITS	RD	42R
104	88150 05002 001	JARRETT CYNTHIA	05002	N	19TH	ST	42R
104	88150 05006 001	B & J ADDERLY	05006	N	19TH	ST	42R
104	88150 05008 001	WATSON JOSEPH J	05008	N	19TH	ST	42R
104	88150 05010 001	COLEMAN STEVE	05010	N	19TH	ST	42R
105	11680 08023 001	GRUBER EUGENE 3RD ETAL	08023		ALBION	ST	42R
105	37300 06107 001	MUSUMECI JOSEPH	06107		GLENMORE	AVE	42R
105	37300 06310 001	J & M HANNA	06310		GLENMORE	AVE	42R
105	37300 06312 001	ONIMUS STELLA	06312		GLENMORE	AVE	42R
105	37300 06314 001	F UMEROGLU	06314		GLENMORE	AVE	42R
105	37300 06316 001	MOYER HELEN A	06316		GLENMORE	AVE	42R
105	37300 06318 001	G A TALARICO	06318		GLENMORE	AVE	42R
105	51000 06325 001	JOSEPH H HEALY	06325		LINMORE	AVE	42R
105	51000 06327 001	DELLA VECCHIA LOUIS	06327		LINMORE	AVE	42R
105	51000 06329 001	DELIBERTIS ANN	06329		LINMORE	AVE	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
106	77220 08101 001	CUYLER RONALD & A	08101		THDURDN ST	42R
107	19740 07505 001	CHERKAS PETER	07505		BUIST AVE	42R
107	19740 07532 001	DEMEIS NICHOLAS T	07532		BUIST AVE	42R
107	19740 07540 001	CHIRILEANU VLAD	07540		BUIST AVE	42R
107	34200 00606 001	WILSON M	00606	W	FISHERS LA	42R
107	34700 07543 001	JOINER HOWARD & D	07543		FORREST AVE	42R
108	12380 09314 001	ALBERTA S JACOBS	09314		ALTON ST	42R
108	22640 07524 001	C & E CHRISTENSEN	07524		CHELWYNDE ST	42R
108	38120 01240 001	HESTON J & AMIE COOPER	01240		GRANT AVE	42R
108	38120 01331 001	BOWLES JOHN & A	01331		GRANT AVE	42R
108	38120 03930 001	RODGERS KENNETH & M	03930		GRANT AVE	42R
108	38760 01813 001	J & M SCAVILLO	01813		GREGG AVE	42R
108	38760 01820 001	SCAVILLO LORETTA	01820		GREGG AVE	42R
108	38760 01824 001	WILKINSON EDNA & S	01824		GREGG AVE	42R
108	38760 01828 001	STANLEY D WILKINSON	01828		GREGG AVE	42R
108	44180 06010 001	SMITH WENDELL	06010	N	HUTCHINSON ST	42R
108	48180 09322 001	TAYLOR WILLIAM	09322		KREWSTOWN RD	42R
109	28810 00003 001	JAKYMIW MYKOLA	00003		DOGWOOD LA	42R
109	54140 05912 001	MARSHALL JOHNNY	05912	N	MARVINE ST	42R
109	64800 00002 001	CHRIS GIGLIOTTI	00002		PINE RD	42R
109	79980 08724 R01	SCHUTZ NICK	08724		VERREE RD	42R
109	79980 08724 R04	MARY K BRODZIK	08724		VERREE RD	42R
109	79980 08724 R05	LEVY HOWARD	08724		VERREE RD	42R
109	79980 09001 001	MURPHY JOSEPH T JR	09001		VERREE RD	42R
110	38400 01404 001	MILLER JANET	01404		GREEN LA	42R
110	38400 01406 001	STEPHENS EDITH	01406		GREEN LA	42R
110	38400 01420 001	E P SANDERS	01420		GREEN LA	42R
110	38400 01424 001	B BREMME	01424		GREEN LA	42R
110	38400 01426 001	MARTHA H SNYDER	01426		GREEN LA	42R
110	38400 01428 001	SNYDER M	01428		GREEN LA	42R
110	38400 01430 001	HALLMAN WILLIAM JR	01430		GREEN LA	42R
110	38400 01432 001	LEMUELL ELMER & FLORENCE	01432		GREEN LA	42R
111	19740 07704 001	KUCZYNSKI ALEX & F	07704		BUIST AVE	42R
111	19740 07706 001	WINSTON CAROLYN	07706		BUIST AVE	42R
111	19740 07808 001	S LEE	07808		BUIST AVE	42R
111	19740 07904 001	C & E CROWERS	07904		BUIST AVE	42R
111	19740 07930 001	KLIMCZAK KATHLEEN	07930		BUIST AVE	42R
111	20020 09901 001	RUNNER MILTON	09901		BUSTLETON AVE	42R
111	20020 09907 001	CRAIG THOMAS F & KIESER W	09907		BUSTLETON AVE	42R
111	20020 09909 001	CARS ONE CONDO INC	09909		BUSTLETON AVE	42R
111	22640 07608 001	MILLER ERIC	07608		CHELWYNDE ST	42R
111	22640 07610 001	EWING WILLIAM & J	07610		CHELWYNDE ST	42R
111	22640 07618 001	MENASION STEVE	07618		CHELWYNDE ST	42R
111	22640 07731 001	KIDD ROBERT & K	07731		CHELWYNDE ST	42R
111	22640 08136 001	KAHAULELIO C	08136		CHELWYNDE ST	42R
111	22640 08315 001	CROWERS EDGAR	08315		CHELWYNDE ST	42R
111	89510 02542 001	INEMER MICHAEL J & P	02542	S	76TH ST	42R
111	89510 02617 001	C & E PORTER	02617	S	76TH ST	42R
111	89510 02629 001	FRY JOSEPH B	02629	S	76TH ST	42R
111	89540 02526 001	JOSEPH H LAGROSSA	02526	S	77TH ST	42R
111	89540 02612 001	HAYES MICHAEL	02612	S	77TH ST	42R
111	89570 02611 001	PHILA MEETING ROOM INC	02611	S	78TH ST	C2R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
112	19480 08024 001	RICHARDSON ABRAHAM	08024	BRUNSWICK	AVE	42R
112	19480 08026 001	PURIEFOY HARRY & CHARLES	08026	BRUNSWICK	AVE	42R
112	19480 08027 001	HENDERSON GUEST ETUX	08027	BRUNSWICK	AVE	42R
112	28500 07603 001	DE BUS ELEANOR	07603	DICKS	AVE	42R
112	28500 07605 001	POWERS JOYCE -	07605	DICKS	AVE	42R
112	28500 07609 001	HALLIGAN EDWARD T	07609	DICKS	AVE	42R
112	28500 08215 001	PAGANO SAMUEL	08215	DICKS	AVE	42R
112	30560 08513 001	FORD PAYTON	08513	EASTWICK	AVE	42R
112	30560 08517 001	BARR BRISTOL & M -	08517	EASTWICK	AVE	42R
112	30560 08521 001	HERNDON ANNIE	08521	EASTWICK	AVE	42R
112	30560 08523 001	JOHNSON RUBY HAMPTON	08523	EASTWICK	AVE	42R
112	30560 08529 001	GEO MARSHALL -	08529	EASTWICK	AVE	42R
112	40560 08107 001	FRANK P KOHN ETUX	08107	HARLEY	AVE	42R
112	40560 08109 001	M MARTIN -	08109	HARLEY	AVE	42R
112	40560 08503 001	WILLIE BELL MARTIN -	08503	HARLEY	AVE	42R
112	40560 08508 001	EICHINGER REGINA M	08508	HARLEY	AVE	42R
112	40560 08513 001	ROBERT BAYNARD	08513	HARLEY	AVE	42R
112	40560 08520 001	J F EICHINGER -	08520	HARLEY	AVE	42R
112	40560 08524 001	SECRETARY OF HUD	08524	HARLEY	AVE	42R
112	40560 08536 001	MILLER JOHNIE	08536	HARLEY	AVE	42R
112	40560 08538 001	R INGIOSI -	08538	HARLEY	AVE	42R
112	50820 08508 001	RAYMOND SCARBO	08508	LINDBERGH	BLV	42R
112	50820 08510 001	HOLLAND EMMA L	08510	LINDBERGH	BLV	42R
112	50820 08512 001	SCHEINER & PENDLETON	08512	LINDBERGH	BLV	42R
112	50820 08514 001	JOESENER SHEARS	08514	LINDBERGH	BLV	42R
112	50820 08516 001	OUTEN CHARLES	08516	LINDBERGH	BLV	42R
112	50820 08524 001	ELIZABETH JONES	08524	LINDBERGH	BLV	42R
112	50820 08540 001	EARL J L	08540	LINDBERGH	BLV	42R
112	50820 08542 001	EVANS PHILLIPS D & S -	08542	LINDBERGH	BLV	42R
112	50821 08102 001	OWNER/OCCUPANT	08102	LINDBERGH-OLD	BLV	42R
112	50821 08104 001	SMITH MILTON & JOSEPHINE	08104	LINDBERGH-OLD	BLV	42R
112	50821 08116 001	CAVAGE GEORGE	08116	LINDBERGH-OLD	BLV	42R
112	50821 08118 001	SHAFRON SONIA	08118	LINDBERGH-OLD	BLV	42R
112	50821 08122 001	JOS & ANNA SHONKA	08122	LINDBERGH-OLD	BLV	42R
112	50821 08124 001	KRULIKOWSKI	08124	LINDBERGH-OLD	BLV	42R
112	50821 08130 001	BAZIS THOMAS	08130	LINDBERGH-OLD	BLV	42R
112	52220 08015 001	RAYMOND COOLEY	08015	LYONS	AVE	42R
112	52220 08016 001	JOSEPH VALENTINE -	08016	LYONS	AVE	42R
112	52800 08010 001	PITCHFORD S	08010	MADISON	AVE	42R
112	52800 08016 001	T JENKINS	08016	MADISON	AVE	42R
112	52800 08026 001	ROBERTS ELIZABETH A	08026	MADISON	AVE	42R
112	52800 08032 001	JOHN DOLHANCEY	08032	MADISON	AVE	42R
112	75280 08109 001	G JONES	08109	SUFFOLK	AVE	42R
112	75280 08111 001	MEDINA-VEGAS BEATRICE	08111	SUFFOLK	AVE	42R
112	75280 08115 001	WISE HENRY	08115	SUFFOLK	AVE	42R
112	75280 08117 001	JAMES W JACKSON JR ETUX	08117	SUFFOLK	AVE	42R
112	89650 02829 001	A & T SCHUTSKY	02829	S 81ST	ST	42R
112	89650 02835 001	EMERUWA ALIYYA EL AMIN	02835	S 81ST	ST	42R
112	89670 03109 001	BROWN THOMAS	03109	S 82ND	ST	42R
112	89670 03113 001	PINKETT THERESA	03113	S 82ND	ST	42R
113	16120 08511 001	SLATTERY MARY C ETAL	08511	BARTRAM	AVE	42R
113	16120 08517 001	HUDYMA OLGA	08517	BARTRAM	AVE	42R

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113	16120 08620 001	ROBINSON CDREAN	08620		BARTRAM AVE	42R
113	39980 09948 001	STEPHEN LAM	09948		HALDEMAN AVE	42R
113	39980 10185 001	THOMAS & THERESA MURDICK	10185		HALDEMAN AVE	42R
113	70880 01936 001	LABBE RICHARD C	01936		SANFORD ST	42R
113	89690 03516 001	REDEV AUTH	03516	S	83RD ST	42R
114	20020 09527 001	FLETCHER V & E	09527		BUSTLETON AVE	42Z
114	20020 09630 001	TURETSKY ERIC	09630		BUSTLETON AVE	42R
114	20020 09707 002	BUSTLETON UNITED METH CH	09707		BUSTLETON AVE	C2Z
114	20020 09708 001	CINKUTIS ANTHONY	09708		BUSTLETON AVE	42R
114	29480 09518 001	BANKER ELMER & E	09518		DUNGAN ST	42R
114	35320 01702 001	GENERALE RONALD & D	01702		FULMER ST	42R
114	35320 01704 001	WINCHESTER HELEN	01704		FULMER ST	42R
114	35320 01712 001	COLLINS JOSEPH & SUSAN	01712		FULMER ST	42R
114	35320 01714 001	ALWINE KATHERINE	01714		FULMER ST	42R
114	35320 01716 001	LAURITO LEONARD & S	01716		FULMER ST	42R
114	38120 01712 001	AMMATURO JOSEPH & EUGENIA	01712		GRANT AVE	42R
114	38120 01714 001	VON CLEF RONALD	01714		GRANT AVE	42R
114	38120 01716 001	VON CLEF RONALD	01716		GRANT AVE	42R
114	38120 02015 001	LISOWSKI SOPHIE	02015		GRANT AVE	42R
114	42920 09700 001	SPIRIDION TYTLA	09700		HOFF ST	42R
114	48100 01718 001	GEARTY JOHN R	01718		KOHL ST	42R
114	48100 01720 001	SCHWERING LOUIS	01720		KOHL ST	42R
114	48100 01723 001	ROBERTS HARVEY B	01723		KOHL ST	42R
114	48100 01725 001	CONNOLLY WANDA F	01725		KOHL ST	42R
114	63580 01700 001	KEN-CREST SERVICES	01700		PEARSON AVE	42R
114	63580 01704 001	BUNN JOHN A III	01704		PEARSON AVE	42R
114	63580 01708 001	ROMAN JAMES J	01708		PEARSON AVE	42R
114	63580 01712 001	PONTARELLI JOSEPH	01712		PEARSON AVE	42R
114	63580 01715 001	DRENNAN WILLIAM & VICKIE	01715		PEARSON AVE	42R
114	89220 09534 001	GALDI DANIEL & C	09534	E	RODSEVELT BLV	42R
114	77360 08501 003	ST RAPHAELS R C RECT	08501		TINICUM AVE	42Z
114	77360 08608 001	GRICCO CARMEN	08608		TINICUM AVE	42R
115	25900 10700 002	JOHNSON ALBERT	10700		CRESTMONT AVE	42R
115	25900 10710 001	HACKERT WANDA	10710		CRESTMONT AVE	42R
115	25900 10720 001	RUETER ROBERT	10720		CRESTMONT AVE	42R
115	31320 10628 001	BURGIN HARRY	10628		ELLICOTT RD	42R
115	31320 10820 001	MOY ROBERT & C	10820		ELLICOTT RD	42R
115	31320 10929 001	CRESTMONT FARMS ATHLETIC	10929		ELLICOTT RD	42R
115	31320 10950 001	REC CH WARDSEN ALL ST CH	10950		ELLICOTT RD	42R
115	33280 00221 001	ASTRO BAR CORP	00221		FAIRMOUNT AVE	42R
115	61500 04001 001	GALLAGHER JOSEPH	04001		ORCHARD LA	42R
115	61500 04100 001	O BRIEN LAWRENCE	04100		ORCHARD LA	42Z
115	61500 04101 001	KANYA STEPHEN	04101		ORCHARD LA	42Z
115	61500 04120 001	CERONE ANTHONY	04120		ORCHARD LA	42Z
115	61500 04121 001	J E & C R BURKE	04121		ORCHARD LA	42Z
115	61500 04131 001	W MCCONAGHY	04131		ORCHARD LA	42R
115	61500 04141 001	TOTO PALMER & S	04141		ORCHARD LA	42Z
115	64625 00035 A01	BERMAN B	00035	N	PIER	42R
115	67640 48020 D01	ASHTON PARK HOMES	48020		RED LN +KNIGHTS	42R
116	48020 11041 001	WEISS FREDERICK A	11041		KNIGHTS RD	42R
116	48020 12020 001	K M SPAHR	12020		KNIGHTS RD	42R
116	48020 12121 001	ELLIS F RUBIN ETUX	12121		KNIGHTS RD	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
116	73480 09801 D01	KELLER J	09801	SOUTHAMPTON	RD	42R
117	20020 07302 D02	PHILA CENTER ASSOC	07302	BUSTLETON	AVE	42R
117	20020 11880 001	CRAIG THOMAS F JR ETAL	11880	BUSTLETON	AVE	42R
117	20020 11900 001	RADBILL STEVEN	11900	BUSTLETON AVE		42R
117	20020 13051 001	BATOFF STEPHEN	13051	BUSTLETON	AVE	42R
117	20020 13057 001	BATOFF STEPHEN & E	13057	BUSTLETON	AVE	42R
117	20020 13069 001	SOMERTON METHODIST CHURCH	13069	BUSTLETON	AVE	42R
117	20020 13151 002	HENRY BIENENFELD	13151	BUSTLETON	AVE	42R
117	20020 14200 001	VANNI EMEDIO ETAL	14200	BUSTLETON	AVE	42R
117	20020 14501 001	CHELTENHAM FED S&L ASSN	14501	BUSTLETON	AVE	42R
117	20020 15200 001	EMILY A STACKHOUSE	15200	BUSTLETON	AVE	42R
117	20020 15251 001	PLATT DAVID	15251	BUSTLETON	AVE	42R
117	20020 15501 001	PLATT DAVID	15501	BUSTLETON	AVE	42R
117	20160 00439 001	FAZEN D ETUX	00439	BYBERRY	RD	42R
117	20160 00801 001	PHILADELPHIA ELECTRIC CO	00801	BYBERRY	RD	42Z
117	20160 00850 001	REYNOLDS JOSEPH JR	00850	BYBERRY	RD	42R
117	20160 01211 001	OWNER/OCCUPANT	01211	BYBERRY	RD	42R
117	20160 02101 001	E & D KESSEL -	02101	BYBERRY	RD	42R
117	20160 02101 002	E & D KESSEL -	02101	BYBERRY	RD	42R
117	25380 00618 001	PLATT JEAN H	00618	COUNTY LINE	RD	42R
117	25380 01044 001	MC GINNISS HUGH & G	01044	COUNTY LINE	RD	42R
117	28240 13007 001	DE PUE EMMA & R	13007	DEPUE	AVE	42R
117	28240 13011 001	JOSEPH & GRACE BERCHICK -	13011	DEPUE	AVE	42R
117	28240 13014 001	SEELY LENFERD J ETAL	13014	DEPUE	AVE	42R
117	28240 13015 001	M T DOLAN ETUX -	13015	DEPUE	AVE	42R
117	30820 00625 001	P C DOWNS	00625	EDISON	AVE	42R
117	30820 00641 001	SQUADRONI JOSEPH	00641	EDISON	AVE	42R
117	30820 01015 001	ROWLEY MICHAEL	01015	EDISON	AVE	42R
117	30820 01075 001	SHOTZBARGER GERARD P	01075	EDISON	AVE	42R
117	31780 15047 001	JOHN F KENNEDY	15047	ENDICOTT	ST	42R
117	34680 00306 001	HARTZELL R W	00306	FOREST HILLS	AVE	42R
117	42204 00829 001	GANTERT JOHN J & CECILE	00829	HERSCHEL	RD	42R
117	42204 01011 001	ZINCK DAVID A & MARIANNE	01011	HERSCHEL	RD	42R
117	42204 01016 001	MIHOCKO DREW S	01016	HERSCHEL	RD	42R
117	42204 01025 001	YEUTTER STEVEN & E	01025	HERSCHEL	RD	42R
117	42204 01031 001	KAPUSTA GREGORY & J	01031	HERSCHEL	RD	42R
117	42204 01045 001	M & S POTTS	01045	HERSCHEL	RD	42R
117	47260 14001 001	MURPHY ARTHUR & R	14001	KELVIN	AVE	42R
117	47260 14034 001	SUTTON SHARON L	14034	KELVIN	AVE	42R
117	47260 14054 001	RONALD J DE NOFA	14054	KELVIN	AVE	42R
117	47260 14055 001	FIDURA ANTHONY	14055	KELVIN	AVE	42R
117	47260 14065 001	ROONEY ROBERT	14065	KELVIN	AVE	42R
117	47260 14074 001	SUTTON CHRISTOPHER	14074	KELVIN	AVE	42R
117	47260 14078 001	HORN ESTHER S	14078	KELVIN	AVE	42R
117	47260 14095 001	J & M MULDOWNEY	14095	KELVIN	AVE	42R
117	47260 14097 001	DYER FRANK R JR -	14097	KELVIN	AVE	42R
117	47260 15015 001	MALLON BEATRICE	15015	KELVIN	AVE	42R
117	47260 15030 001	DAY JOHN & M	15030	KELVIN	AVE	42R
117	47260 15035 A01	GRAFF JOHN F	15035	KELVIN	AVE	42R
117	47260 15035 001	HARDING ALAN W & K	15035	KELVIN	AVE	42R
117	47260 15036 001	CHARLES H HALL	15036	KELVIN	AVE	42R
117	47260 15037 001	DREXLER GEORGE	15037	KELVIN	AVE	42R

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117	47260 15040 001	MELINSON JAMES R	15040	KELVIN	AVE	42R
117	47260 15050 001	OCONNOR CHASE E	15050	KELVIN	AVE	42R
117	47260 15055 001	KEOUGH EDWARD & B	15055	KELVIN	AVE	42R
117	47260 15060 001	MEISTER MICHAEL	15060	KELVIN	AVE	42R
117	47260 15065 001	HAAG GEORGE J	15065	KELVIN	AVE	42R
117	50580 13010 001	J & F PICCARI	13010	LEWIS	ST	42R
117	50580 13025 001	G & F STARK	13025	LEWIS	ST	42R
117	50580 13026 001	PAVIOS	13026	LEWIS	ST	42R
117	50580 13035 001	BONETT RONALD J	13035	LEWIS	ST	42R
117	50880 00510 001	JACOBS STANLEY & P	00510	LINDENHURST	ST	42R
117	50880 00515 001	A PENGLER -	00515	LINDENHURST	ST	42R
117	50880 00521 001	PROVIDENT NAT'L BANK	00521	LINDENHURST	ST	42R
117	50880 00525 001	GERNEY MILDRED	00525	LINDENHURST	ST	42R
117	51960 01019 001	COLLINS JAMES	01019	LUKENS	ST	42R
117	53320 00312 001	KALSTEIN RONALD & DEBORAH	00312	MAPLE	AVE	42R
117	53320 00617 001	DAHLBERG ANDREW	00617	MAPLE	AVE	42R
117	53320 00618 001	GARVIN FRANCES & K -	00618	MAPLE	AVE	42R
117	62020 00130 001	KLOTZ HOWARD & R	00130	OVERHILL	AVE	42R
117	64420 15031 001	SCHERNECK WILLIAM J & B -	15031	PEYTON	ST	42R
117	64420 15041 001	PETER ZEISS ETUX -	15041	PEYTON	ST	42R
117	64420 15044 001	RALPH E KATES JR -	15044	PEYTON	ST	42R
117	64420 15047 001	HENRY KOLOS	15047	PEYTON	ST	42R
117	65780 13025 001	WILLIAM & M FRANCE -	13025	PROCTOR	RD	42R
117	65780 13050 001	W & R WINSLOW -	13050	PROCTOR	RD	42R
117	65780 13060 001	F & O VERZILLI	13060	PROCTOR RD		42R
117	65780 13070 001	EDWARD R ZEBROWSKI -	13070	PROCTOR	RD	42R
117	65780 13420 001	N F LYNCH ETUX -	13420	PROCTOR RD		42R
117	65780 13430 001	I A CANTNER -	13430	PROCTOR	RD	42R
117	65780 13450 001	LODISE ROCCO & E	13450	PROCTOR	RD	42R
117	65780 13470 001	WALTER GARY & MONICA	13470	PROCTOR	RD	42R
117	65780 13476 001	MC QUARY E & D JR	13476	PROCTOR	RD	42R
117	65780 13480 001	H R RICKER -	13480	PROCTOR RD		42R
117	65780 13490 001	FARIES RONALD & E -	13490	PROCTOR	RD	42R
117	71980 12000 001	J C DINARDO ETUX -	12000	SEWELL RD		42R
117	73300 00500 001	ST ANDREWS IN THE FIELD -	00500	SOMERTON	AVE	C2R
117	73300 00510 001	ST ANDREWS IN THE FIELD -	00510	SOMERTON	AVE	C2R
117	73300 00523 001	WEBER DAVID & J	00523	SOMERTON	AVE	42R
117	73300 00524 001	P GERNEY ETUX	00524	SOMERTON	AVE	42R
117	73300 00550 001	GEORGE J WHELAN	00550	SOMERTON	AVE	42R
117	73300 00556 001	C W LOMBARDI & C -	00556	SOMERTON	AVE	42R
117	73300 00574 001	MEISTER MICHAEL	00574	SOMERTON	AVE	42R
117	73480 00551 001	TOMCZAK CHRISTOPHER & M	00551	SOUTHAMPTON	RD	42R
117	73480 00825 001	RUDOLPH ROBERT J	00825	SOUTHAMPTON	RD	42R
117	73480 00845 001	WM & E MEEHAN -	00845	SOUTHAMPTON	RD	42R
117	73480 00845 002	W & E MEEHAN	00845	SOUTHAMPTON	RD	42Z
117	73480 01000 001	R & J MC LERNAN	01000	SOUTHAMPTON	RD	42R
117	73480 01100 001	IMMANUEL EVANG LUTH CH	01100	SOUTHAMPTON	RD	42Z
117	73480 01226 001	HRECZAN JOHN & K	01226	SOUTHAMPTON	RD	42R
117	73480 01242 001	NARDI THOMAS & M	01242	SOUTHAMPTON	RD	42R
117	73480 01278 001	J PETERSON JR -	01278	SOUTHAMPTON	RD	42R
117	73480 01284 001	O BRIEN MARIE	01284	SOUTHAMPTON	RD	42R
117	73480 01291 001	VARELA J & M -	01291	SOUTHAMPTON	RD	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
117	73480 01295 001	DYKE SUSAN ANN & OZGA F -	01295	SOUTHAMPTON	RD	42R
117	73480 01299 001	R E ROONEY ETUX	01299	SOUTHAMPTON	RD	42R
117	74760 09888 001	PA COMMONWEALTH OF DOT	09888	STEVENS	RD	42R
117	74760 12042 001	PAGAN PEDRO & SOSA E	12042	STEVENS	RD	42R
117	77820 13250 001	SUMMETON MASONIC CLUB	13250	TREVOSE RD		42R
117	77820 13420 001	H & R GABRIEL -	13420	TREVOSE RD		42R
117	77820 13430 001	Q J & D A GILL -	13430	TREVOSE	RD	42R
117	77820 13431 001	HOFELDER C & E	13431	TREVOSE	RD	42R
117	77820 13440 001	RICHARD P JUSHCHYSHYN ETX	13440	TREVOSE RD		42R
117	77820 13441 001	H MAC CRACKEN	13441	TREVOSE	RD	42R
117	77820 13450 001	L DAVIOSON	13450	TREVOSE RD		42R
117	77820 13451 001	E C OLSZEWSKI	13451	TREVOSE	RD	42R
117	77820 13460 001	LOVE JOHN & S	13460	TREVOSE	RD	42R
117	77820 13471 001	WEYERHAUSER A	13471	TREVOSE	RD	42R
117	77820 13477 001	E & D MOFFIT -	13477	TREVOSE	RD	42R
117	77820 13485 001	RUDDEN JOSEPH	13485	TREVOSE	RD	42R
117	77820 13491 001	MC BRIDE JAMES & C	13491	TREVOSE	RD	42R
117	77820 13497 001	CHRISTIAN RONALD H	13497	TREVOSE	RD	42R
117	77820 14033 001	WALCHAK PAUL M	14033	TREVOSE	RD	42R
117	77820 15000 001	EDWARD H SCHULTZ ETUX -	15000	TREVOSE	RD	42R
117	77820 15011 001	JUDELSOHN D H & G	15011	TREVOSE	RD	42R
117	77820 15015 001	BOJCZUK ZENOWY L	15015	TREVOSE	RD	42R
117	77820 15035 001	CIVITILLO MARK & RP	15035	TREVOSE	RD	42Z
117	77820 15045 001	M WALSH	15045	TREVOSE	RD	42R
117	77820 15051 001	ENGLE ROWLAND & R	15051	TREVOSE	RD	42R
117	77830 13000 001	GONTZ EDWARD	13000	TRINA	DR	42R
117	82980 00619 001	MAC DONALD LESLIE B	00619	WHITNEY	ST	42R
117	82980 00630 001	R & J FOSTER	00630	WHITNEY	ST	42R
117	84740 13001 001	CODISPOTI JOSEPH & J	13001	WORTHINGTON	RD	42R
117	84740 15015 001	M W SHOTYNSKI ETUX	15015	WORTHINGTON	RD	42R
117	84740 15019 001	HORTON PAUL & M	15019	WORTHINGTON	RD	42R
117	84740 15023 001	KING EUGENE & A	15023	WORTHINGTON	RD	42R
118	15740 09530 001	JESSE E FOX JR -	09530	BANES	ST	42R
118	15740 09535 001	J A RAUCH	09535	BANES	ST	42R
118	15740 09537 001	LEICHLITER CHARLES A	09537	BANES	ST	42R
118	15740 09545 001	C & B WILENT JR -	09545	BANES	ST	42R
118	15740 09610 001	T DAVIS ETUX	09610	BANES	ST	42R
118	15740 09617 001	LETTS WILLIAM R JR	09617	BANES	ST	42R
118	15740 09619 001	KUHN SCOTT HENRY	09619	BANES	ST	42R
118	15740 09621 001	P & R HAINES	09621	BANES	ST	42R
118	15740 09623 001	ROBERT & DOLORES H RYDER	09623	BANES	ST	42R
118	15740 09624 001	CAHILL GEORGE & CAROL	09624	BANES	ST	42R
118	15740 09625 001	DRENNEN WILLIAM F	09625	BANES	ST	42R
118	15740 09626 001	ADDINGTON BARBARA	09626	BANES	ST	42R
118	15740 09628 001	ROANTREE LAWRENCE & C	09628	BANES	ST	42R
118	15740 09636 001	ORTIZ ISABELL M	09636	BANES	ST	42R
118	15740 11609 001	H J THERN	11609	BANES	ST	42R
118	15740 11611 001	G & M BARNES JR	11611	BANES	ST	42R
118	17960 01102 001	J HOBBINS	01102	BLOOMDALE	RD	42R
118	17960 01104 001	BARBARA A WILKES	01104	BLOOMDALE	RD	42R
118	17960 01106 001	PAUL L GERO ETUX	01106	BLOOMDALE	RD	42R
118	17960 01113 001	CHARLESTEIN RICKIE & S	01113	BLOOMDALE	RD	42R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
118	35320 09703 001	M & D CINESI	09703	FULMER	ST	42R
118	35320 09719 001	DUNN JOHN & E	09719	FULMER	ST	42R
118	38120 01335 D01	GRANT AVE 109FT	01335	GRANT	AVE	42R
118	63600 00720 001	WILLIAM ULMER JR	00720	PECAN	DR	42R
118	84800 09040 R01	CLEMENS JAMES X & H	09040	PINE	RD	42R
118	64800 09040 R02	GIGLIOTTI ANGELINE	09040	PINE	RD	42R
118	64800 09040 R03	MONTEMURO FRANK	09040	PINE	RD	42R
118	64800 09040 R04	RICHARD ODONNELL	09040	PINE	RD	42R
118	64800 09040 R05	SALVIND MICHAEL & F	09040	PINE	RD	42R
118	79980 09753 001	CHARLES K MANG	09753	VERREE	RD	42R
118	82240 01027 001	GERALD & P GAWRONSKI	01027	WELSH	RD	42R
118	82240 01140 D01	GRANT PLAZA ASSOCIATES	01140	WELSH	RD	42Z
118	82240 01541 001	SCHRIEBER FRANCIS & D	01541	WELSH	RD	42R
118	82240 01650 001	L WATSON & E	01650	WELSH	RD	42R
118	82240 01650 002	L & E WATSON	01650	WELSH	RD	42R
118	82240 01708 001	WM H & M T THORN	01708	WELSH	RD	42R
118	82240 01714 001	A ZAWOJSKI	01714	WELSH	RD	42R
118	82240 01718 001	HICKMAN BYRON	01718	WELSH	RD	42Z
118	82240 01726 001	R G LAZAR	01726	WELSH	RD	42R
118	82240 01728 001	R LAZAR	01728	WELSH	RD	42R
118	82240 02122 001	LOMBARDI ADOLPH	02122	WELSH	RD	42R
118	82240 03122 001	COOPER MARIE	03122	WELSH	RD	42R
118	82240 03199 D01	PARISE JOSEPH A	03199	WELSH	RD	42R
118	84440 09802 001	E J TOBIN ETUX	09802	WOODFERN	RD	42R
620	17360 00186 001	GERIATRIC & MEDICAL SERV	00186	BETHLEHEM	PK	42X
620	22620 00101 001	WARREN & KELSO CO	00101 W	CHELTENHAM	AVE	Y2N
620	22240 04001 001	WCAU	04001	CITY	AVE	Y2V
620	23240 04401 001	LORD & TAYLOR	04401	CITY	AVE	Y2V
620	22240 04899 001	ACME SUPERMARKET	04899	CITY	AVE	Y2N
620	34040 00400 001	MIRARCHI BRUNO	00400	FILLMORE	ST	42R
620	38120 74440 B01	BUCKS COUNTY WATER&SEWER	74440	GRANT +STATE		W3B
620	59450 07801 001	SERIANNI D	07801	NEW	ST	42R
620	59450 07811 001	ROMAN & ROMAN	07811	NEW	ST	42R
620	77360 00610 002	SCOTT PAPER CO	00610	TINICUM	AVE	Y2V
620	83460 01000 001	DONOFRY THOMAS	01000 E	WILLDW GROVE	AVE	42R
820	12160 00621 002	PHILA CITY OF	00621 W	ALLENS	LA	Y2V
820	12400 02878 D01	CITY OF PHILA	02878	AMBER	ST	S2Z
820	13000 00726 002	PHILA CITY OF	00726	ARCH	ST	Y60
820	16860 01900 001	LOGAN CIRCLE FOUNTAIN	01900	BENJ. FRANKLIN	PKY	Z2N
820	19140 13000 D02	PHILA CITY OF FPK	13000	BROAD +ARCH		42R
820	19140 22740 D02	PHILA CITY OF FPK	22740	BROAD +CHERRY		42R
820	19140 22740 003	PHILA CITY OF	22740	BROAD +CHERRY		42R
820	19140 73800 001	PHILA CITY OF FPK	73800	BROAD +SPRNG G		42R
820	19140 84320 D01	PHILA CITY OF FPK	84320	BROAD +WOOD		42R
820	19160 00500 004	HEALTH CENTER #1 0350A	00500 S	BROAD	ST	Y2W
820	19160 03551 001	VETERNAS STADIUM 0201A	03551 S	BROAD	ST	Y2N
820	19160 63340 D06	CITY OF PHILA	63340	BROAD +PATTSN		Y20
820	19160 63340 D07	PHILA CITY OF	63340 S	BROAD	ST	Y2N
820	20160 01140 001	FIRE ENG CO 58 0475A	01140	BYBERRY	RD	Z20
820	20800 02563 001	PHILA CITY OF	02563	CADWALLADER	ST	S2R
820	21860 02925 001	PHILA CITY OF	02925	CASTOR	AVE	Y2W
820	21860 07522 002	PHILA CITY OF	07522	CASTOR	AVE	Y2N

DAY	ACCOUNT	OWNER	ADDRESS				SERVICE
820	22580 00088 002	NORTHWEST REG LIB 05828	00068	W	CHELTEN	AVE	Y2N
820	32680 00328 003	COMMONWEALTH OF PENNA	00328	W	CHELTEN	AVE	Y2W
820	22820 00500 006	INDEPEND SQ INC	00500		CHESTNUT	ST	Y2W
820	28020 62680 001	CITY OF PHILA	62680		DELWR +PACKER		Z2Q
820	28020 73220 003	SEC DELAWARE &	73220		DELWR +SNYDER		Y2V
820	28020 81140 002	PHILA CITY OF 1566A	81140		DELWR +WALNUT		Y2W
820	31980 00199 005	PHILA CITY OF	00199	E	ERIE	AVE	Y2V
820	32200 45120 045	PHILA CITY OF	45120		ESSNGTN+ISLAND		Y2S
820	33280 00110 001	CITY OF PHILA	00110		FAIRMOUNT	AVE	S2Z
820	33280 03741 001	CITY OF PHILA	03741		FAIRMOUNT	AVE	S2Z
820	33290 00026 001	ORMISTON MANSION	00026	E	FAIRMOUNT PARK		Z2Q
820	33290 00030 001	CITY OF PHILA FPK	00030	E	FAIRMOUNT PARK		Z2R
820	33290 00056 001	STRAWBERRY MANSION	00056	E	FAIRMOUNT PARK		Z2X
820	33290 00068 001	WOODFORD MANSION	00068	E	FAIRMOUNT PARK		Z2Q
820	33290 00087 F01	CITY OF PHILA	00087	E	FAIRMOUNT PARK		S2Z
820	33290 00087 F02	CITY OF PHILA	00087	E	FAIRMOUNT PARK		S2Z
820	33290 00087 F03	CITY OF PHILA	00087	E	FAIRMOUNT PARK		S2Z
820	33290 00087 F04	CITY OF PHILA	00087	E	FAIRMOUNT PARK		S2Z
820	33290 00087 F06	CITY OF PHILA	00087	E	FAIRMOUNT PARK		S2Z
820	33290 00087 F07	CITY OF PHILA	00087	E	FAIRMOUNT PARK		S2Z
820	33290 00087 F08	CITY OF PHILA	00087	E	FAIRMOUNT PARK		S2Z
820	33290 00087 F09	CITY OF PHILA	00087	E	FAIRMOUNT PARK		S2Z
820	33290 00087 F11	CITY OF PHILA	00087	E	FAIRMOUNT PARK		S2Z
820	33290 00087 F12	CITY OF PHILA	00087	E	FAIRMOUNT PARK		S2Z
820	33290 00087 F13	CITY OF PHILA	00087	E	FAIRMOUNT PARK		S2Z
820	33295 00017 001	PHILA CITY OF FPK	00017	W	FAIRMOUNT PARK		Z2Q
820	33295 00023 001	FALLS ROAD CONN	00023	W	FAIRMOUNT PARK		Z2Q
820	33295 00025 001	RIDGELAND MANSION	00025	W	FAIRMOUNT PARK		Z2P
820	33295 00027 001	CITY OF PHILA	00027	W	FAIRMOUNT PARK		Z2Q
820	33295 00067 001	SWEETBRIAR MANSION	00067	W	FAIRMOUNT PARK		Z2P
820	34840 03257 003	PHILA CITY OF	03257		FOX	ST	Y2N
820	34840 03325 009	PHILA CITY OF	03325		FOX	ST	Y2V
820	35220 15460 001	PHILA CITY OF FPK	15460		FRONT +BAINBRD		Z2X
820	35220 51520 002	PHILA CITY OF FPK	51520		FRONT +LOMBARD		Z2Q
820	35220 73440 001	PHILA CITY OF FPK	73440		FRONT +SOUTH		Z2Q
820	37040 02100 004	CITY OF PHILA	02100	W	GIRARD	AVE	Y2W
820	37440 02529 001	PHILA CITY OF	02529	W	GLENWOOD	AVE	Y2W
820	41980 25220 001	PHILA CITY OF	25220		HENRY	AVE	Y2N
820	41980 83080 001	PHILA CITY OF	83080		HENRY	AVE	Z2X
820	45120 32130 001	MAINT & STORAGE BLD13536	32130		ISLAND +ESCORT		Y2V
820	45120 32200 027	ISLAND & ESSINGTON 13456	32200		ISLAND +ESSNGTN		Y2V
820	45120 71120 001	ISLAND & SAYBROOK 01958	71120		ISLAND +SAYBRK		Y2W
820	46170 01500 002	PHILA CITY OF	01500		JOHN F KENNEDY	BLV	Y2V
820	48180 64030 001	KREWSTOWN & PENN 0579A	64030		KREWSTW+PENNYPC		Z2R
820	50920 88980 002	PHILA GENERAL HOSPITAL	88980	S	LINDBRG+58TH		Y2V
820	51640 04423 002	CITY OF PHILA	04423		LONGSHORE	AVE	Y2N
820	52020 00151 001	ENGINE 55 0485A	00151	E	LUZERNE	ST	Y2W
820	54200 02742 003	PHILA CITY OF	02742		MASCHER	ST	Y2N
820	55180 05817 001	CITY OF PHILA	05817		MEDIA	ST	S2Z
820	56760 02627 001	CITY OF PHILA	02627	W	MONTGOMERY	AVE	S2Z
820	57420 02600 003	CITY OF PHILA REC	02600		MORRIS	ST	Y2N
820	63620 06813 001	KELLY PLGD 0242A	06813		PECHIN	ST	Z2R

DAY	ACCOUNT	OWNER		ADDRESS			SERVICE
820	64625 00011 D01	CITY OF PHILA		00011 N	PIER		Z2W
820	64625 00032 003	EAST CENTRAL INC	0392B	00032 N	PIER		Y2N
820	64630 00080 A02	PHILA DE CITY		00080 S	PIER		Y2V
820	65360 02201 004	PHILA NURSING HOME	0363D	02201	POPLAR	ST	Y2N
820	65880 04526 001	PHILA CITY OF		04526	PULASKI	AVE	Y2N
820	67120 00323 002	POL INT'L AFFAIR	0321B	00323	RACE	ST	Y2W
820	67180 01338 003	POLICE TRAFFIC	0571B	01338	RACE	ST	Y2W
820	68180 01330 001	PHILA CITY OF		01330	RHAWN	ST	Y2V
820	68280 02815 006	AUTOMOTIVE MAINT	0374B	02815	RIDGE	AVE	Y2N
820	68280 04208 002	FIRE ENG CO 35	0478B	04208	RIDGE	AVE	Y2N
820	68280 06630 002	CAHILL CHOLERIO ROSI		06630	RIDGE	AVE	Y2N
820	68600 06000 004	CITY OF PHILA		06000	RISING SUN	AVE	Y2W
820	69220 08605 R01	PHILA CITY OF		08605 E	ROOSEVELT	BLV	Z2R
820	71030 79930 D01	PHILA CITY OF		79930	SATURN	PL	Y2D
820	73800 00300 002	PHILA CITY OF		00300	SPRING GARDEN	ST	Y2V
820	73800 03902 002	R B M ASSOCIATES		03902	SPRING GARDEN	ST	Y2N
820	74440 07979 003	RIVERVIEW	0336C	07979	STATE	RD	Y2W
820	74440 08201 003	STATE RD	0338C	08201	STATE	RD	Y2V
820	74440 13500 D01	PHILA CITY OF		13500	STATE	RD	Y2N
820	75580 01101 003	PENROSE PLAYGRD P000181C		01101 W	SUSQUEHANNA	AVE	Y2W
820	78600 09101 001	FISH HATCHERY	0238B	09101	TACONY	ST	H2X
820	80120 01901 003	CENTRAL LIB	0584C	01901	VINE	ST	Y2N
820	81560 01500 002	CITY OF PHILA		01500	WASHINGTON	AVE	Y2N
820	82820 04020 003	PHILA CITY OF		04020	WHITAKER	AVE	Y2N
820	82820 04020 004	PHILA CITY OF		04020	WHITAKER	AVE	Y2N
820	83080 00726 D01	CITY OF PHILA		00726	WIGARD	AVE	Z2R
820	84320 01913 003	CITY OF PHILA		01913	WOOD	ST	Y2N
820	84480 07303 001	PHILA CITY OF		07303	WOODLAND	AVE	Z2R
820	87870 00851 003	CITY OF PHILA		00851 N	04TH	ST	Y2W
820	87910 01401 002	CITY OF PHILA		01401 N	06TH	ST	Y2W
820	87970 01700 003	PHILA CITY OF		01700 N	09TH	ST	Y2W
820	88140 01330 D01	CITY OF PHILA		01330 S	18TH	ST	S2Z
820	88320 63040 D01	22ND & PARKWAY	0569A	63040	22ND +PARKSD		Y2N
820	88320 63040 D02	22ND & PARKWAY	0564B	63040	22ND +PARKSD		Y2V
820	88320 63040 D03	22ND & PARKWAY	0564C	63040	22ND +PARKSD		Y2N
820	88470 00427 007	CIVIC CENTER	0416E	00427 S	34TH	ST	Y2V
820	88470 00427 008	CIVIC CENTR	0416F	00427 S	34TH	ST	Y2T
820	88470 00427 009	CIVIC CNTR	0416G	00427 S	34TH	ST	Y2T
821	11200 09501 D10	CITY OF PHILA		09501	ACADEMY	RD	Y2G
821	11810 00001 D01	CARGO CITY CARGO UNIT		00001	AIRPORT SERVICE	RD	Y2N
821	12040 02901 003	UNITANK TERMINAL SERVICE		02901 E	ALLEGHENY	AVE	Z2X
821	20880 01823 002	PHILA CITY OF		01823	CALLOWHILL	ST	Y2W
821	33295 00023 D01	CITY OF PHILA		00023 W	FAIRMOUNT PARK		Z2R
821	33295 00024 D01	CHAMOUNIX COTTAGE		00024 W	FAIRMOUNT PARK		Z2R
821	33295 00027 D01	PHILA CITY OF FPK		00027 W	FAIRMOUNT PARK		C2R
821	34980 09550 002	JOHN BYRNE GOLF CLUB		09550	FRANKFORD	AVE	Z2V
821	38120 05001 001	PHILA CITY OF FPK		05001	GRANT	AVE	C2Q
821	38120 05001 002	PHILA CITY OF FPK		05001	GRANT	AVE	C2X
821	38120 05001 003	PHILA CITY OF FPK		05001	GRANT	AVE	C2R
821	42120 00700 002	CITY OF PHILA FPK		00700	HERMIT	LA	Z2R
821	50780 00206 D01	PHILA CITY OF FPK		00206	LINCOLN	DR	Z2R
821	50780 00207 D01	PHILA CITY OF		00207	LINCOLN	DR	Z2R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
821	50780 00208 D01	PHILA CITY OF FPK	00208		LINCOLN DR	Z2R
821	50780 00209 D01	CITY OF PHILA FPK	00209		LINCOLN DR	Z2R
821	50780 00210 D01	PHILA CITY OF FPK	00210		LINCOLN DR	Z2R
821	51220 84085 D01	CITY OF PHILA FPK	84085		LIVEZEY+WISSHCK	Z2R
821	64030 00050 D01	PHILA CITY OF FPC	00050		PENNYPACK PRK	42R
821	64625 00005 D03	PHILA CITY OF	00005	N	PIER	Y2Q
821	64625 00009 D02	CITY OF PHILA	00009	N	PIER	Y2W
821	64625 00009 D03	PHILA CITY OF	00009	N	PIER	Z2X
821	64625 00012 D02	PHILA PORT CORP	00012	N	PIER	Y2N
821	64625 00015 D02	WATERSIDE CAFE	00015	N	PIER	Z2X
821	64625 00019 D02	PHILA PORT CORP	00019	N	PIER	Z2X
821	64625 00019 D03	PHILA PORT CORP	00019	N	PIER	42N
821	64630 00038 D01	PENN CITY WAREHOUSE INC	00038	S	PIER	Z2Q
821	64630 00038 D02	PHILA CITY OF	00038	S	PIER	Y2X
821	64630 00038 D03	PHILA CITY OF	00038	S	PIER	Y2N
821	64630 00040 D01	PENN CITY WAREHOUSE INC	00040	S	PIER	Z2Q
821	64630 00040 D02	PHILA CITY OF	00040	S	PIER	Z2R
821	64630 00078 D01	PHILA PORT CORP	00078	S	PIER	Y2N
821	64630 00078 D02	PHILA PORT CORP	00078	S	PIER	Z2Q
821	64630 00078 D04	PHILA PORT CORP	00078	S	PIER	Z2X
821	64630 00078 D05	PHILA PORT CORP	00078	S	PIER	Y2W
821	64630 00080 D03	CITY OF PHILA	00080	S	PIER	Y2V
821	64630 00080 D04	CITY OF PHILA	00080	S	PIER	Y2V
821	64630 00082 D02	CITY OF PHILA	00082	S	PIER	Y2V
821	64630 00084 D03	PHILA CITY OF	00084	S	PIER	Z2R
821	64630 00098 D01	PHILA CITY OF	00098	S	PIER	Z2Q
821	64630 00098 D02	PHILA CITY OF	00098	S	PIER	Y2T
821	64630 00110 D01	HOLT CARGO SYSTEMS	00110	S	PIER	Y2E
821	67640 60020 D04	NORPAC HANGAR	60020		RED LN +NORCOM	Y2V
821	71360 06800 001	PHILA CITY OF FPK	06800		SCOTFORTH RD	Z2R
821	81180 00720 D07	PHILA CITY OF FPK	00720	W	WALNUT LA	Z2N
821	84060 06245 D01	CITY OF PHILA	06245		WISSAHICKON AVE	Z2Q
821	84480 07303 D01	FRIENDS OF BLUE BELL	07303		WOODLAND AVE	Z2R
828	53000 03760 001	CONNELLY CONTAINER INC	03760		MAIN ST	H2V
828	68240 05000 002	ROHM & HAAS CO	05000		RICHMOND ST	42W
828	68240 05000 003	ROHM & HAAS CO	05000		RICHMOND ST	42W
828	68240 05000 005	ROHM & HAAS CO	05000		RICHMOND ST	42N
835	42680 00099 D02	UNIVERSITY OF PENNA	00099		HILLCREST AVE	N2R
835	55080 09414 001	MORRIS ARBORETUM	09414		MEADOWBROOK AVE	N2R
840	87990 01825 002	TEMPLE-KARDON/BOX	01825	N	10TH ST	Y2N
840	87990 01825 003	TEMPLE-KARDON/BOX	01825	N	10TH ST	Y2W
845	68280 08108 001	SEPTA	08108		RIDGE AVE	42R
850	17360 00100 001	SEPTA	00100		BETHLEHEM PK	S2Q
850	37500 00820 001	SEPTA MC & SA 550080 652	00820	W	GODFREY AVE	42Z
850	59920 72300 D01	CONRAIL READING DIV	72300		NIXON +SHAWMNT	42R
855	28020 03625 D01	CONRAIL CORP	03625	S	DELAWARE AVE	42N
855	37300 06222 001	AMTRAK ACCTS PAYABLE	06222		GLENMORE AVE	42R
855	88020 04322 D01	CONRAIL CORP	04322	S	11TH ST	42W
858	34720 00099 001	ARMY CORP ENGINEER	00099		FORT MIFFLIN RD	H2N
858	81660 02099 D04	U S GOVT	02099		OREGON AVE	Y2E
858	87840 00134 002	FED GOV	00134	S	02ND ST	G2X
859	22800 20020 D01	PA COMMONWEALTH OF DOT	20020		CHESTNT+BUSTLTN	P2R

DAY	ACCOUNT	OWNER	ADDRESS			SERVICE
859	82820 31980 002	DEPT OF PUBLIC WELFARE	31980		WHITKR +ERIE	Y2V
860	11080 03102 002	PHILA HOUSING AUTH 01- A	03102	W	ABBOTTSFORD AVE	A2V
906	11740 00934 001	LEHIGH AVE BAPTIST CHURCH	00934		ALBURGER AVE	C2Q
906	20020 13150 001	WIDENMEYER A & L	13150		BUSTLETON AVE	42Q
906	20160 00301 001	KLINE GEORGE & MILDRED	00301		BYBERRY RD	42R
906	20160 01229 001	PHILA ELECTRIC CO	01229		BYBERRY RD	42Q
906	20160 01800 001	PHILA AUTH FOR INDRL DEV	01800		BYBERRY RD	42P
906	58924 00001 A01	MALPEZZI T	00001		MOREDUN AVE	42Q
906	62080 07845 001	SCALZO VINCENT	07845		OXFORD AVE	S2R
906	65780 13475 001	F H TRAINER	13475		PROCTOR RD	42Q
906	73240 00700 002	SCHMIDT OTTO & L	00700		SOLLY AVE	42Q
906	73480 01055 001	DI GIACAMO LOUIS	01055		SOUTHAMPTON RD	42Q
906	73480 01075 001	PHILA QUARETTE CLUB	01075		SOUTHAMPTON RD	42P
906	73480 01125 001	PHILA MAGYAR OTTHON CLUB	01125		SOUTHAMPTON RD	42P
906	79980 08001 002	SNODGRASS ELIZABETH	08001		VERREE RD	42Q
906	79980 09990 001	COMBINED REHABILITATION	09990		VERREE RD	42R
908	20160 03330 001	BYBERRY BAPTIST CHURCH	03330		BYBERRY RD	C2P
908	31320 10710 001	THOMAS T HOLT	10710		ELLICOTT RD	42R
908	34960 08500 003	ST DOMINICS ROMAN	08500		FRANKFORD AVE	42Q
908	34960 08500 005	ST DOMINICS RC CHURCH	08500		FRANKFORD AVE	42R
908	34960 09100 002	MOBIL OIL CO 16DFB	09100		FRANKFORD AVE	42Q
910	28000 09242 001	GARGANO H	09242	N	DELAWARE AVE	42P
910	28320 05200 001	WISSINOMING YATCH CLUB	05200		DEVEREAUX AVE	42Q
910	56300 09601 001	MAGARGAL L & H	09601		MILNOR ST	42Q
910	76600 09326 001	METAL DYNAMICS CORP	09326		TACONY ST	42Q
910	78020 08301 001	THALHEIMER BROS INC	08301		TULIP ST	42X
910	84100 07001 001	J D M MATERIALS CO INC	07001		WISSINOMING ST	42W
913	34960 06064 001	N CEDAR HILL CEMETERY CO	06064		FRANKFORD AVE	42Q
914	89280 01043 001	ROMAN A CYBRIWSKY	01043	W	69TH AVE	42Q
918	13080 06110 001	JOHNSON E W	06110		ARDLEIGH ST	42Q
918	18620 08125 001	EVANS HAROLD	08125		BOYER ST	42Q
918	64480 00637 001	FRANK J & E	00637	W	PHIL ELLENA ST	42Q
918	78060 00099 001	MALONE RICHARD	00099	E	TULPEHOCKEN ST	42P
918	79020 00234 001	CHURCH OF THE INTERNATION	00234	W	UPSAL ST	42Q
918	81600 01120 R01	ZIEGER & SONS INC	01120	E	WASHINGTON LA	42P
919	81600 01635 001	CHELTEN HILLS CEMETERY CO	01635	E	WASHINGTON LA	42Q
922	11160 00404 001	KING WILLIAM JR & M	00404	E	ABINGTON AVE	42Q
922	12160 00512 001	TENDLER REBECCA	00512	W	ALLENS LA	42Q
922	12160 00610 001	BECK DAVID & M	00610	W	ALLENS LA	42Q
922	12160 00614 001	PODLOS JOAN H	00614	W	ALLENS LA	42Q
922	12160 00630 001	MYRICH HOWARD & ROBERTA	00630	W	ALLENS LA	42Q
922	12160 00704 001	WASHINGTON GROVER JR	00704	W	ALLENS LA	42Q
922	12160 00710 002	C H SWAIN	00710	W	ALLENS LA	42Q
922	12160 00716 001	BUTLER D & M	00716	W	ALLENS LA	42Q
922	12160 00737 001	NELSON J & S	00737	W	ALLENS LA	42Q
922	12160 00741 001	CONSTANTINE ANTHONY	00741	W	ALLENS LA	42Q
922	16700 00051 001	WEBER G L & M G	00051	E	BELLS MILL RD	42Q
922	16700 00079 002	W & M ALFORD	00079	E	BELLS MILL RD	42R
922	16700 00099 001	KATZ GERALD & MAGEN E A	00099	E	BELLS MILL RD	42R
922	16700 00101 001	COHEN HAROLD K	00101	E	BELLS MILL RD	42Q
922	16720 00016 002	FELIX MARY ELLEN	00016	W	BELLS MILL RD	42Q
922	16720 00031 001	MORRIS ELEANOR	00031	W	BELLS MILL RD	42Q

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922	17360 00090 001	DAMICO L & N W	00090	BETHLEHEM	PK	42Q
922	17360 00129 001	UNIVERSITY OF PENN	00129	BETHLEHEM	PK	42Q
922	17360 00132 001	CAFFREY E & M	00132	BETHLEHEM	PK	42Q
922	17360 00138 001	BYRNE DONALD F	00138	BETHLEHEM	PK	42Q
922	17360 00139 001	W S CROWDER & I J	00139	BETHLEHEM	PK	42Q
922	17360 00141 001	LANDAU JON	00141	BETHLEHEM	PK	42Q
922	17360 00150 001	BURKETT RANDALL & G	00150	BETHLEHEM	PK	42Q
922	17360 00160 001	BETHLEHEM PIKE	00160	BETHLEHEM	PK	42Q
922	17360 00185 001	E B NALLE	00185	BETHLEHEM	PK	42P
922	17360 00185 002	E B NALLE	00185	BETHLEHEM	PK	42Q
922	21770 00007 001	MARTIN R	00007	CARYL	LA	42Q
922	22860 00031 001	CHESTNUT HILL BLDGS CORP	00031 E	CHESTNUT HILL	AVE	42X
922	22860 00039 001	PHELAN GERALD	00039 E	CHESTNUT HILL	AVE	42Q
922	22860 00041 002	BERKMAN JAMES S & M	00041 E	CHESTNUT HILL	AVE	42Q
922	22880 00100 001	BROWN AUGUSTUS	00100 E	CHESTNUT HILL	AVE	42Q
922	22860 00116 001	W & L DWYER	00116 E	CHESTNUT HILL	AVE	42Q
922	22880 00011 001	JOHNSTON HARRY	00011 W	CHESTNUT HILL	AVE	42Q
922	22880 00020 001	HENRY N VAUGHAN	00020 W	CHESTNUT HILL	AVE	42Q
922	22880 00102 001	KRIPAITIS ROBERT & E	00102 W	CHESTNUT HILL	AVE	42Q
922	22880 00113 001	MULHERN CHARLES JR	00113 W	CHESTNUT HILL	AVE	42Q
922	22880 00115 001	JACK L RAY	00115 W	CHESTNUT HILL	AVE	42Q
922	22880 00124 001	L A MARABELLA ETUX	00124 W	CHESTNUT HILL	AVE	42Q
922	22880 00130 001	LEE P & E	00130 W	CHESTNUT HILL	AVE	42Q
922	22880 00203 001	HUMES JAMES C ETUX	00203 W	CHESTNUT HILL	AVE	42Q
922	22880 00218 001	KESSLER CONSTANCE C	00218 W	CHESTNUT HILL	AVE	42Q
922	22880 00305 002	CASCADE APHASIA PROGRAM	00305 W	CHESTNUT HILL	AVE	C2Q
922	22880 00310 001	JENKS JOHN & E	00310 W	CHESTNUT HILL	AVE	42Q
922	22880 00310 002	JENKS JOHN & E	00310 W	CHESTNUT HILL	AVE	42P
922	22880 00410 001	DHODY DINESH	00410 W	CHESTNUT HILL	AVE	42Q
922	22880 00429 001	PHILIP PRICE ESQ	00429 W	CHESTNUT HILL	AVE	42P
922	22880 00437 001	HAIMES PETER EVAN &	00437 W	CHESTNUT HILL	AVE	42Q
922	22880 00444 001	HOWE ARTHUR 4TH & LISA	00444 W	CHESTNUT HILL	AVE	42Q
922	22880 00446 001	BARTON HENRY	00446 W	CHESTNUT HILL	AVE	42Q
922	22880 00450 001	KNOX THOMAS & L	00450 W	CHESTNUT HILL	AVE	42P
922	22880 00455 001	MC HUGH J & S	00455 W	CHESTNUT HILL	AVE	42Q
922	22880 00460 001	STAINTON EDWARD & C	00460 W	CHESTNUT HILL	AVE	42Q
922	25680 08801 001	POPKY GEORGE	08801	CREFELD	ST	42Q
922	25680 08803 001	BRADY STEPHEN & J S	08803	CREFELD	ST	42P
922	25680 08803 002	BRADY STEPHEN F	08803	CREFELD	ST	42R
922	25680 08836 001	MIQUON UPPER SCHOOL	08836	CREFELD	ST	C2X
922	25680 08909 001	UTSING PETER & DEBORAH	08909	CREFELD	ST	42Q
922	25680 08917 001	W E & J G ZEITER	08917	CREFELD	ST	42Q
922	25680 08919 001	RIZZO CARMELLA	08919	CREFELD	ST	42Q
922	25680 09002 001	SUGAR LOAF CLUB INC	09002	CREFELD	ST	42Q
922	25680 09002 002	SUGAR LOAF CLUB INC	09002	CREFELD	ST	42X
922	25680 09006 001	MALLERY JUDITH CHAPPELL	09006	CREFELD	ST	42Q
922	25680 09012 001	W K KLEIN ETUX	09012	CREFELD	ST	42Q
922	25680 09120 001	FREDERIC & E BALLARD	09120	CREFELD	ST	42Q
922	26020 08306 R01	MC COUBREY JOHN W & A	08306	CRITTENDEN	ST	42R
922	32520 00398 001	LIUZZI M & G	00398 E	EVERGREEN	AVE	42Q
922	36660 09230 R01	SUGAR LOAF CLUB INC	09230	GERMANTOWN	AVE	42X
922	36660 09230 002	SUGAR LOAF CLUB INC	09230	GERMANTOWN	AVE	42Q

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922	38220 00495 001	STINGER H & M	00495 E	GRAVERS	LA	42Q
922	38240 00427 001	PENN WYNNE ASSOCIATES	00427 W	GRAVERS	LA	42Q
922	38240 00501 001	WHITENACK STEPHEN & J	00501 W	GRAVERS	LA	42P
922	38240 00607 R01	KOPPLE DAN PETER	00607 W	GRAVERS	LA	42Q
922	38240 00607 001	NOONAN JOHN	00607 W	GRAVERS	LA	42Q
922	40320 00032 001	OWNER/OCCUPANT	00032 W	HAMPTON	RD	42Q
922	40320 00101 001	LEAR ROBERT	00101 W	HAMPTON	RD	42X
922	42680 00010 001	KIMBERLY JOHN & B	00010	HILLCREST	AVE	42Q
922	42680 00042 001	URBAN WILLIAM J	00042	HILLCREST	AVE	42Q
922	44120 07801 001	KILOUFF JAMES A & E	07801	HURON	ST	42Q
922	49340 00016 001	MARTIN FRANCIS E	00016	LAUGHLIN	LA	42Q
922	49340 00018 001	PETER RANDALL	00018	LAUGHLIN	LA	42Q
922	49340 00025 001	DOWNS T	00025	LAUGHLIN	LA	42Q
922	52180 00199 001	ALFRED W FREUND	00199	LYNNEBROOK	LA	42Q
922	52180 00204 001	SCHINDLER PROPERTIES	00204	LYNNEBROOK	LA	42Q
922	52180 00205 001	SHEPHERD R H	00205	LYNNEBROOK	LA	42Q
922	54640 07512 002	HORAN CHARLES WOODWARD	07512	MC CALLUM	ST	42Q
922	55060 09408 001	SIMOLA FRANCIS	09408	MEADOWBROOK	AVE	42Q
922	55060 09427 001	MALOUMIAN RICHARD	09427	MEADOWBROOK	AVE	42Q
922	55680 00326 001	SPRINGS E	00326 W	MERMAID	LA	42Q
922	56980 00432 001	DAVID KOLLOCK	00432 W	MORELAND	AVE	42Q
922	56980 00501 001	BEATTY ALBERT & D	00501 W	MORELAND	AVE	42P
922	56980 00511 001	HILSMAN WILLIAM E	00511 W	MORELAND	AVE	42Q
922	56980 00527 001	CURRIE C G & P	00527 W	MORELAND	AVE	42Q
922	56980 00540 001	J S PEAKE JR ETUX	00540 W	MORELAND	AVE	42Q
922	57420 00712 001	LURIA HELEN	00712 W	MT AIRY	AVE	42Q
922	59100 08605 001	NICHOLS VAL E & V	08605	NAVAJO	RD	42Q
922	60060 00003 001	SMITH COREY	00003	NORMAN	LA	42Q
922	60060 00005 001	SERGIO A ESPERDY ETUX	00005	NORMAN	LA	42Q
922	60060 00009 001	JOHNSTON H & L	00009	NORMAN	LA	42Q
922	60080 00014 001	GRUENBERG HELEN	00014	NORMAN	LA	42Q
922	60240 08840 001	CHESTNUT HILL HISTORL SOC	08840	NORWOOD	AVE	42Q
922	60240 08870 001	NAUGHTON J M ETUX	08870	NORWOOD	AVE	42Q
922	60240 08871 001	CORSON MARY ANNE	08871	NORWOOD	AVE	42Q
922	65820 08432 001	BLUM CAROL R	08432	PROSPECT	AVE	42Q
922	65820 08715 001	ADATTE R	08715	PROSPECT	AVE	42Q
922	68120 00460 001	MRS JAMES M SKINNER JR	00460	REX	AVE	42Q
922	68120 00537 001	COLLETTI PAUL	00537	REX	AVE	42P
922	71740 08500 001	PUTNAM A W ETUX	08500	SEMINOLE	AVE	42P
922	71740 08600 002	KARNAVAS C & A	08600	SEMINOLE	AVE	42Q
922	71740 08617 001	SELDENECK L WOOD	08617	SEMINOLE	AVE	42Q
922	71740 08702 001	MALLERY B & V	08702	SEMINOLE	AVE	42Q
922	74080 00601 001	LEVITT G & B	00601	ST GEORGES	RD	42Q
922	74080 00621 001	LINSO GERALD & B	00621	ST GEORGES	RD	42Q
922	74080 00691 001	ECHER P	00691	ST GEORGES	RD	42Q
922	74080 00643 001	DILKS J H & M D	00643	ST GEORGES	RD	42Q
922	74080 00711 001	S DANIEL LINKER	00711	ST GEORGES	RD	42Q
922	74080 00714 001	HEYMANN EVELYN M	00714	ST GEORGES	RD	42Q
922	74080 00736 001	BLUMBERG A ETUX	00736	ST GEORGES	RD	42Q
922	74180 08115 001	ROTHSCHILD ELLIOT & S	08115	ST MARTINS	LA	42Q
922	74180 08219 001	BUTTENWIESER P & MAREK T	08219	ST MARTINS	LA	42Q
922	74180 08410 002	H S VALENTINE	08410	ST MARTINS	LA	42Q

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922	74180 08420 001	FREDERICK W G PECK	08420 ST MARTINS LA	42Q
922	74660 08040 001	3RD CHURCH OF CHRIST	08040 STENTON AVE	C2Q
922	74660 08780 001	HOWLIN M & J	08780 STENTON AVE	42Q
922	74660 08820 001	MC GILL JOHN & C	08820 STENTON AVE	42Q
922	74660 08850 001	LOVERING JOS S	08850 STENTON AVE	42Q
922	74660 09326 001	THOMAS LLOYD ETUX	09326 STENTON AVE	42Q
922	75440 00025 002	FOULKE WALTER L	00025 SUMMIT AVE	42Q
922	75440 00041 001	THOMSON KEITH S	00041 SUMMIT ST	42Q
922	75440 00042 001	LESNICK HOWARD	00042 SUMMIT AVE	42Q
922	75560 00002 001	ESPENSHADE DAVIS & J	00002 E SUNSET AVE	42Q
922	75560 00030 001	PEARSON C & S	00030 E SUNSET AVE	42Q
922	75580 00021 001	MC DEVITT EDWARD & S	00021 W SUNSET AVE	42Q
922	77620 08800 001	BROWN RICHARD P JR	08800 TOWANDA AVE	42Q
922	77620 08811 001	BUTCHER M K	08811 TOWANDA AVE	42Q
922	77620 08820 001	PODOLIN LEONARD & ROBERTA	08820 TOWANDA AVE	42Q
922	77620 08830 001	KERR ALEXANDER & M W	08830 TOWANDA AVE	42Q
922	77620 08840 001	UPDYKE RANDOLPH	08840 TOWANDA AVE	42Q
922	77620 08860 001	KENNEDY ROBERT W	08860 TOWANDA AVE	42Q
922	77620 08860 002	KENNEDY ROBERT W	08860 TOWANDA AVE	42Q
922	77620 08862 002	PARRY RICHARD	08862 TOWANDA AVE	42Q
922	77620 08870 001	WALSH PATRICIA S	08870 TOWANDA AVE	42P
922	77620 08872 001	WOLF ELIAS	08872 TOWANDA AVE	42Q
922	79680 00007 001	HONG CHANGPYO & N	00007 VALLEY VIEW RD	42Q
922	79680 00018 001	JOSEPH S MATERNIA	00018 VALLEY VIEW RD	42R
922	79680 00019 001	GALBALLY JAMES F JR & A	00019 VALLEY VIEW RD	42Q
922	81760 00009 002	WIZDO LORI DURDA	00009 WATERMAN AVE	42Q
922	81760 00010 001	MC CAUSLAND PETER & B	00010 WATERMAN AVE	42Q
922	81760 00016 001	MILLER BUVEL	00016 WATERMAN AVE	42Q
922	81760 00018 001	STARR RALPH	00018 WATERMAN AVE	42Q
922	81760 00020 001	HOYES GARRY W & A	00020 WATERMAN AVE	42Y
922	81760 00021 002	MILLER JOHN G	00021 WATERMAN AVE	42Q
922	81760 00022 001	MURPHY RICHARD J	00022 WATERMAN AVE	42Q
922	81880 07110 001	I N & M M PINCUS	07110 WAYNE AVE	42Q
922	81880 07201 001	HANKOWSKY WILLIAM & R	07201 WAYNE AVE	42Q
922	82920 00200 001	MELLOR JAMES & ANN	00200 WHITEMARSH ST	42Q
922	83480 00451 001	PHILA CRICKET CLUB	00451 W WILLOW GROVE AVE	42P
922	83480 00530 001	CHESTNUT HILL ACADEMY	00530 W WILLOW GROVE AVE	C2Q
922	83480 00530 003	WISSAHICKON SKATING CLUB	00530 W WILLOW GROVE AVE	42P
923	12820 04106 001	KING WILLIAM	04106 APALOGEN RD	42Q
923	12820 04126 001	HERBERT SWINBURNE	04126 APALOGEN RD	42Q
923	12820 04163 001	DES JARDINS JOHN	04163 APALOGEN RD	42Q
923	25940 00612 001	EIDAM ROSEMARIE	00612 CRESTVIEW RD	42R
923	25940 00612 003	R FERGUSON	00612 CRESTVIEW RD	42R
923	28840 00400 001	WCAU TV	00400 DOMINO LA	42Q
923	39840 08401 001	STEVENSON GERTRUDE G M	08401 HAGYS MILL RD	42Q
923	48000 01015 001	W & L RIES	01015 KITCHENS LA	42Q
923	48000 01021 001	SAMUELS AURELE	01021 KITCHENS LA	42Q
923	61620 00468 001	LYPYNSKY W K INSTITUTE	00468 ORIOLE ST	42Q
923	68280 07354 002	KISS BROADCASTING LTD	07354 RIDGE AVE	42Q
923	68280 07608 001	W P COOKE INC	07608 RIDGE AVE	42Q
923	71280 03343 001	KATZ LAWRENCE	03343 W SCHOOL HOUSE LA	42Q
923	71280 03535 001	MILLER M W	03535 W SCHOOL HOUSE LA	H2R

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923	71280 03545 001	RABINOVITZ HYMAN & SUSAN	03545	W	SCHOOL HOUSE LA	H2P
923	73720 00560 001	MILLER CHARLES	00560		SPRING LA	42Q
923	73720 00605 001	AGUIRRE MELANIO & H	00605		SPRING LA	42Q
923	73720 00708 001	REDDICK WILLIAM M ETAL	00708		SPRING LA	42Q
923	73840 06699 001	HAY J & B	06699		SPRINGBANK ST	42Q
923	77340 04109 001	SPECKER A R	04109		TIMBER LA	42Q
923	77340 04112 001	MASER MARVIN & S	04112		TIMBER LA	42Q
923	77340 04119 001	BAYLSON M ETUX	04119		TIMBER LA	42Q
923	77340 04122 001	D HENZE HERBERT	04122		TIMBER LA	42Q
923	77340 04145 001	MAX & MARY RONIS	04145		TIMBER LA	42P
923	82620 01001 001	MALMED RICHARD	01001		WESTVIEW AVE	42Q
923	82620 01016 001	LEVY M W & L F	01016		WESTVIEW AVE	42Q
923	82620 01017 001	HILTON DAVID & ANNE	01017		WESTVIEW AVE	42Q
923	82620 01018 001	UTESCHER E E	01018		WESTVIEW AVE	42Q
923	82620 01024 001	LATIES ALAN M	01024		WESTVIEW AVE	42Q
923	82620 01025 001	SPILLER RAYMOND & M	01025		WESTVIEW AVE	42Q
923	82620 01026 001	W & S MAXMAN	01026		WESTVIEW AVE	42Q
923	83080 00431 001	CAPITOL CITIES COM	00431		WIGARD AVE	42P
923	84060 06610 001	6610 WISSAHICKON ASSOC	06610		WISSAHICKON AVE	42Q
923	84060 06611 001	ADLER JERROLD & J	06611		WISSAHICKON AVE	42P
923	84060 06635 001	PUNNETT THOMAS R & HOPE	06635		WISSAHICKON AVE	42Q
923	84060 06700 001	MASON SAMUEL & D	06700		WISSAHICKON AVE	42Q
923	84060 06800 001	VAUGHN EARL	06800		WISSAHICKON AVE	42Q
923	84060 06801 001	CORELLI CRAIG & J	06801		WISSAHICKON AVE	42Q
923	84060 06900 001	ENPIERE C & E	06900		WISSAHICKON AVE	42R
923	84060 07000 002	COHEN RICHARD M	07000		WISSAHICKON AVE	42Q
923	84060 07020 001	GARDEN MARC & L	07020		WISSAHICKON AVE	42Q
923	84060 07100 001	TALACKI ADAM	07100		WISSAHICKON AVE	42P
923	84060 07215 001	W S MARINE & D S	07215		WISSAHICKON AVE	42Q
924	71280 02910 001	GTMN FRIENDS SCHOOL	02910	W	SCHOOL HOUSE LA	42P
925	50560 02104 R02	ALLEGHENY IRON & METAL CO	02104		LEWIS ST	42P
925	79820 01604 003	M A DOOLING & SONS SALES	01604		VANDIKE ST	42R
926	12040 02901 002	UNITANK TERMINAL SERVICE	02901	E	ALLEGHENY AVE	42X
926	12300 04300 001	HOLY REDEEMER CEMETERY	04300		ALMOND ST	42Q
926	28000 04301 001	KASPER MICHAEL	04301	N	DELAWARE AVE	42P
926	34960 03558 001	ST JOAN OF ARC CHURCH -	03558		FRANKFORD AVE	C2X
926	41560 03101 001	A P GREEN FIRE BRICK CO	03101		HEDLEY ST	42Q
926	41560 03101 002	A P GREEN FIRE BRICK CO	03101		HEDLEY ST	42X
926	41560 03101 003	KASPER BROS	03101		HEDLEY ST	42X
926	41560 03101 004	KASPER BROS	03101		HEDLEY ST	42Q
926	68240 04300 001	REDEMPTORIST FATHERS PA	04300		RICHMOND ST	C2Q
927	34180 01401 D01	S E & G F ROSS	01401	E	FISHERS LA	42Q
927	35180 00351 001	JOSEPH P & H GIAVERELLI	00351		FROGMOOR ST	42Q
928	68030 06448 001	ASKIN SARA	06448	N	12TH ST	42Q
928	89180 01000 001	WHITMAN R & L	01000	W	66TH AVE	42Q
942	38340 03401 001	E I DUPONT DE NEMOURS CO	03401		GRAYS FERRY AVE	42N
942	38340 03401 002	E I DUPONT DE NEMOURS CO	03401		GRAYS FERRY AVE	42N
943	63240 03144 002	ATLANTIC RICHFIELD CO 92	03144	W	PASSYUNK AVE	42W
943	63240 03144 003	ATLANTIC RICHFIELD CO	03144	W	PASSYUNK AVE	42Q
943	63240 03144 005	ATLANTIC RICHFIELD CO 92	03144	W	PASSYUNK AVE	42Q
943	63240 03144 007	ATLANTIC RICHFIELD CO 92	03144	W	PASSYUNK AVE	42X
943	63240 03144 008	ATLANTIC REFINING & MKTNG	03144	W	PASSYUNK AVE	42X

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 HEADER=WATER DEPARTMENT
 HEADER=WATER ONLY CUSTOMERS
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943	63240 03144 010	ATLANTIC REFINING & MKTNG	03144 W PASSYUNK AVE	42W
943	63240 03144 014	ATLANTIC RICHFIELD CO	03144 W PASSYUNK AVE	42N
943	64080 03699 D03	GULF OIL CORP	03699 PENROSE AVE	42X
943	88180 03318 001	3400 CORP	03318 S 20TH ST	42P
943	88180 64080 D01	S 20TH ST & PENROSE	64080 20TH +PENROSE	42X
943	88180 64080 D02	S 20TH ST &	64080 20TH +PENROSE	42X
943	88180 64080 D03	TIDEWATER GRAIN CO	64080 20TH +PENROSE	42X
944	79800 02001 002	EELLS WM	02001 VANDALIA ST	42Q
947	32200 06600 001	DI NARDO ANDREW JR	06600 ESSINGTON AVE	42Q
947	32200 06800 002	D AMATO ANTHONY & R	06800 ESSINGTON AVE	42X
947	32200 08198 002	GULF OIL CORP	08198 ESSINGTON AVE	42E
947	32260 07627 001	DELICCI JOSEPH & MARLYN	07627 ESTE AVE	42Q
947	34720 00002 001	BUCKLEY & CO INC	00002 FORT MIFFLIN RD	42R
947	63240 06320 001	PIONEER OIL CO	06320 W PASSYUNK AVE	42Q
947	63240 06399 D01	SS W PASSYUNK AVE	06399 W PASSYUNK AVE	42X
947	63240 06401 001	CARLY LIMOUSINE SERVICE	06401 W PASSYUNK AVE	42P
947	63240 06491 D01	LARRY & DICKS AUTO RECYCL	06491 W PASSYUNK AVE	42P
947	77360 08501 004	ST RAPHAELS CHURCH -	08501 TINICUM AVE	C2X
947	88980 02701 002	TRAP ROCK CO	02701 S 58TH ST	42X
947	89040 03246 001	S GOLDSTEIN & C	03246 S 61ST ST	42Q
947	89040 03265 001	JERRY'S CORNER	03265 S 61ST ST	42X
947	89040 03268 001	DEVELOPERS A & D	03268 S 61ST ST	42Q
948	15620 06201 001	MURSAM CORP	06201 BALTIMORE AVE	42P
948	88940 02598 D08	ROYAL PETROLEUM CORP	02598 S 56TH ST	42X
952	84480 04206 R01	WOODLANDS CEMETERY CO	04206 WOODLAND AVE	42Q
954	30700 16760 D01	UNITY BRDCSTNG NETWORK	16760 EDGELEY+BELMONT	42P

Streets With High Density Of On-Lot Disposal Systems

STREETS IN AREAS A - G

Section A	Section B	Section C	Section D	
Bustleton Ave	Alton	Ashton Rd	Baker	Lawn
Byberry Rd	Bustleton Ave	Welsh Rd	Belfry Rd	Lerow
DePue Ave	Dungan Ave	Willits Rd	Boone	Leverington Ave
Edison Ave	Fulner		Brierdale	Linezey
Endicott?	Grant Ave		Cadillac Lane	Lothian Pl
Forest Hill Ave	Gregg		Carnegrie Dr	Manatawna
Kelvin Ave	Haleman Ave		Carson	Manti
Lewis	Hilspach		Churchview	Mitchell
Lindenhurst Rd	Hoff		Cinnaminson	Newland
Lukens Ave	Kohl		Crestview	Oriel
Maple Ave	Krewstorm		Cross	Orile
Overhill	Lockwood/Bloomdale		Culp	Paoli
Proctor Rd	Mather		Dearnley	Parker Ave
Prosepct Ave	Old Bustletown Ave		Delmar	Pawling
Sewell Rd	Pearson		Evergreen	Pechin
Southampton Rd	Pecan		Flamingo	Penbroke
Stevens Rd	Roosevelt Blvd		Fountain	Ridge Pike (Ave)
Trevose Rd	Veree		Fowler	Roxborough & Henry
Trina Dr	Welsh Ave		Grakyn Lane	Shaw
Whitney	Woodfern		Granville	Shawmat
Woodhaven Rd			Green Lane	Sherwood str.
Worthington Ave			Hagys Mills Rd	Silverwood
			Harner	Spring Lane
			Hendren	Summit Ave
			Henry Ave	Summit Pl.
			Hermatage	Sunset Ave
			Hermit Street	Tower
			Hillside	Walnut
			Keely	Wigard Ave
			Keiffer	Wise's Mill
				Wissahickon Ave

Section E	Section F	Section G
Arlington	Allens	Cherry Lane
Bells Mills	Carpenter	Cresson
Bethlehem Pike	Creshire	Schoolhouse Lane
Chestnut Hill	Glen Echo	Timber lane
Crefeld	McCallum	
Germantown Ave	Mt. Pleasant	
Gravers Lane	Parkline	
Hampton	Phil-ellena	
Highland Ave	Sherman	
Hillcrest	Springbrook	
Laughlin	St. Georges	
Lynn Brook Lane	Wayne	
Meade	Westview	
Meadow Brook	Wissahickon	
Newton		
Normah		
Norwood Ave		
Prospect Ave		
Rex Ave		
Seminole Ave		
Shawnee St		
Southampton		
Stenton		
Sunset Ave		
Valley View Rd		
Waterman		
Willowgrove		
Winston		

New Septic Permit Listings

PHILADELPHIA ACT 537
NEW SEPTIC PERMIT LISTING FOR
PROPERTIES IN HIGH DENSITY SECTIONS

DATE	STREET	NUMBER	NAME	PROBLEM SECTION
Feb-73	Paoli Ave.	261	J. Criniti	D
Jun-75	Spring La.	Unknown	L. Middlemiss	D
Oct-76	Paoli Ave.	301	A. Cannono	D
Mar-77	W. Gravers La.	525	G. Chambers	E
Mar-78	Cliff Rd.	240	A. Corrado	D
Jul-78	Pecan Dr.	702	Hunter Construction Co	B
Aug-78	Cliff Rd.	6934	J. Capriolti	D
Sep-79	Paoli Ave.	216	Radio Broadcast	D
Sep-79	Summit Ave.	479	Algeri	D
Jul-80	Meadowbrook Rd.	9410	F.L. Simola	E
Dec-80	W. Evergreen Ave.	400	J. Maurer	D
May-81	E. Chestnut Hill Ave.	101	A. Brown	E
Apr-84	W. Gravers La.	650	P. Pregina	E
Mar-85	W. Gravers La.	605	P. Dilks	E
Mar-85	W. Gravers La.	607	J. Noonan	E
Mar-85	W. Gravers La.	607R	D. Kopple	E
Jan-85	Pawling St.	7519	J. Pauline	B
Feb-85	Waterman Ave.	4	J. Koeber	E
Mar-85	Spring La.	475	Preimcer Medical Sys.	D
Feb-86	W. Evergreen Ave.	453	S. Lawrence	D
Oct-86	Waterman Ave.	6	J. Candido	E
Nov-86	W. Allens La.	753	D. Stone	F
Jan-87	E. Bells Mill Rd.	147	R.B. Balbirmnie	E
Feb-87	Hillcrest Ave.	Lot #2	Dennis-Bruce Homes	E
Mar-87	Gravers La.	West End	C. Drake	E
Mar-87	Manatawna	710	A. Corrado	D
Mar-87	Pawling St.	7500	A. Bolger	B
Apr-87	W. Gravers La.	701	E. Censun	E
Jun-87	Bells Mill Rd.	Lot #5	Dennis-Bruce Homes	E
Jul-87	School House La.	3015	2nd Church of Christ	G
Jun-88	W. Highland Ave.	236	C. Nordland	E
Oct-88	Kelvin Ave.	15061	C.&P. Schuck	A
Dec-88	Spring La.	717	J. Lima	D
Mar-89	Kelvin Ave.	15035	A.&K. Harding	A
Mar-89	Manatawna	724	P. Crossan	D
Jul-89	Cinnaminson St.	321	R. Biddle	D
Jul-89	Cinnaminson St.	323	R. Biddle	D

DATE	STREET	NUMBER	NAME	PROBLEM SECTION
Jul-89	Cinnaminson St.	325	R. Biddle	D
Aug-89	Bethlehem Pk.	101	M. McMockin	E
Nov-89	School House La.	3535	S. Barry	G
Mar-90	Hillcrest La.	174	D.F. Binswanger	E
Apr-90	Hillcrest Ave.	100	B.&L. Watson	E
Apr-90	Hillcrest Ave.	184	R. Chesco	E
Nov-90	Spring La.	639	J. MacGribe	D
Aug-91	Kelvin Ave.	15009	J. Morace	A

Properties With On-Lot Malfunctions

PHILADELPHIA ACT 537
PROPERTIES WITH ON-LOT MALFUNCTIONS
IN HIGH DENSITY SECTIONS

DATE	STREET	NUMBER	NAME	PROBLEM SECTION
Nov-75	McCallum St.	7329	B. Gotwals	F
Jan-76	Timber La.	4101	D.I. Berger	G
Jul-78	Germantown Ave.	9120	E.M. Bast	D
Jan-79	Proctor Rd.	13476	E. McQuartz	A
Mar-79	Mather Rd.	9125	Miller	B
May-79	Westview Ave.	1020	M.M. Dean	F
Nov-79	Trevose Rd.	15035	R.H. Charleston	A
Jun-80	Prospect Ave.	8711	R. Foreman	E
Feb-81	Lawn St.	7509	Lees	D
Mar-81	Evergreen Ave.	450	M. Truhan	D
Feb-82	Lawn st.	7511	DelMonte	D
Jan-83	Manti St.	7501	Kaelin	D
Sep-83	Proctor Rd.	13450	R. Lodise	A
Dec-83	Prospect Ave.	8714	J. Agostinelli	E
Apr-84	Meadowbrook Rd.	9400	M. Kamstra	E
May-84	W. Allens La.	716	D. Butler	F
Aug-84	Meadowbrook Rd.	9423	P. Shepperd	E
Oct-84	Dearnley St.	399	G. Martelli	D
May-85	Laughlin La.	19	H.M. Irwin	E
Oct-85	W. Allens La.	600	N.&R. Ruben	F
Dec-85	Lothian Pl.	1	Kaminski	D
Sep-86	Norman La.	9	H. Johnston	E
Mar-87	Bethlehem Pk.	86	Unknown	E
Apr-87	Bethlehem Pk.	88-90	Dialysis Center	E
Jun-87	E. Lemonte St.	249	Casselli	D
Jul-87	Westview Ave.	1016	L. Levy	F
Aug-87	W. Hampton Rd.	4	J.Conran	E
Aug-87	W. Hampton Rd.	11	R. Levi	E
Aug-87	Hillcrest Ave.	Lot #4	Unknown	E
Sep-87	Timber La.	4024	R.&A. Stone	G
Apr-88	W. Hampton Rd.	17	J. Levine	E
Apr-88	Proctor Rd.	13430	I. Canten	A
Apr-89	W. Allens La.	701	Dr. M. Yanoff	F
May-89	W. Byberry Rd.	100	Philmont Mobil Station	A
May-89	Westview Ave.	1000	E.A. Vaughn	F
Jun-89	Trevose Rd.	13471	A.A. Weyershaevser	A

DATE	STREET	NUMBER	NAME	PROBLEM SECTION
Mar-90	Proctor Rd.	13470-75	Unknown	A
Apr-90	Pawling St.	6921	Unknow	D
Jun-90	Delmar St.	204	Mr. West	D
Jun-90	Lemonte St.	226	P.A. Jones	D
Jun-90	Summit Ave.	31	Unknown	D
Jul-90	W. Chestnut Hill Ave	7	R. Recce	E
Aug-90	E. Bells Mill Rd.	110	J. Mulhern	E
Aug-90	Waterman Ave.	22	R. Murphy	E
Aug-91	E. Bells Mill Rd.	151	D.S. Fishbone	E
Oct-91	W. Chestnut Hill Ave	305	Cascade Aphasia Cut.	E

Plumbing Rules And Regulations

(4) The level of the outlet inverts shall be not less than four (4) inches nor more than six (6) inches above floor.

(5) All bends used in the disposal field shall have tight joints at each end of the bend.

§8-1410. Materials

(1) Pipe used for the line between the septic tank and the distribution box and on all laterals from distribution box to the tile field shall be bell and spigot type of vitrified clay with water-tight joints. Pipe used under driveways or other areas subject to heavy loads shall be bell and spigot cast-iron with leaded joints.

(2) Field tile used in the disposal field shall be not less than four (4) inches in diameter and shall be laid with ¼ inch open joints. Material used on top of the tile shall be graded so as to prohibit filtering of the backfill material into the tile lines, varying from one-half inch (½) to two and one-half (2½) inches in size. Cinders or ashes shall not be used for field tile bed.

(3) All open joints shall be protected, on top, by strips of asphalt-treated building paper at least eight (8) inches long and three (3) to six (6) inches wide.

(4) Grade boards, securely staked in the bottom of the trench, shall be provided for all lines except where bell and spigot pipe is used. Where necessary to maintain proper grade and cover, a line may be terraced by construction of a suitable brick or concrete drop box, or by use of 45 degree ells with watertight joints on the off set.

§8-1411. Trenches

(1) No disposal trench shall be constructed in filled ground, except by the approval of the Department and the Department of Health.

(2) Seepage Area. The minimum seepage area of the disposal field shall be determined by a percolation test, as prescribed in §8-1413 conducted in accordance with the following table:

PLUMBING
RULES AND REGULATIONS

TABLE II

DATA FOR DETERMINING TILE FIELD OR LOOSE WELL REQUIREMENTS FROM PERCOLATION TESTS

	TILE FIELD	*LOOSE WELL*
Average time required for water in test hole to fall one inch, in minutes	*Effective absorption area (area in bottom of disposal trench in sq. ft. per bedroom*	*Effective absorption area (area in bottom and loose walls in sq. ft. per bedroom)*
2 or less	75	40
3	85	50
4	95	55
5	105	60
10	135	75
15	160	90
30	205	150
45	245	215
60	275	280
Over 60 unsuitable except for special design with loose walls		

(3) All disposal trenches shall be the same width and length and shall conform to the following requirements for size and spacing:

TABLE III

SIZE AND MINIMUM SPACING REQUIREMENTS FOR DISPOSAL TRENCHES

Width of Trench at Bottom in Inches	*Depth of Trench in Inches*	*Effective Absorption Area in Sq. Ft. Per Lin. Ft.*	*Minimum Spacing of Lines C to C in Feet*
18	18 to 30	1.5	6.0
24	18 to 30	2.0	6.0
30	18 to 36	2.5	7.5
36	24 to 36	3.0	9.0

(4) Disposal trenches shall conform to the following minimum standards:

Minimum number of lines per field	2
Maximum length of individual lines	100 feet
Minimum bottom width of trench	18 inches
Maximum depth of cover of tile lines	36 inches
Preferred depth of cover of tile lines	18 inches
Maximum grade of tile lines	6 inches per 100 feet
Preferred grade of tile line	2 inches to 4 inches per 100 feet
Minimum filter material under tile	6 inches
Minimum filter material over tile	2 inches

(5) A minimum of 150 square feet of effective absorption area (100 lineal feet) of 18 inch trench shall be provided per living unit.

§8-1412. Loose Wells

(1) Size and Capacity.

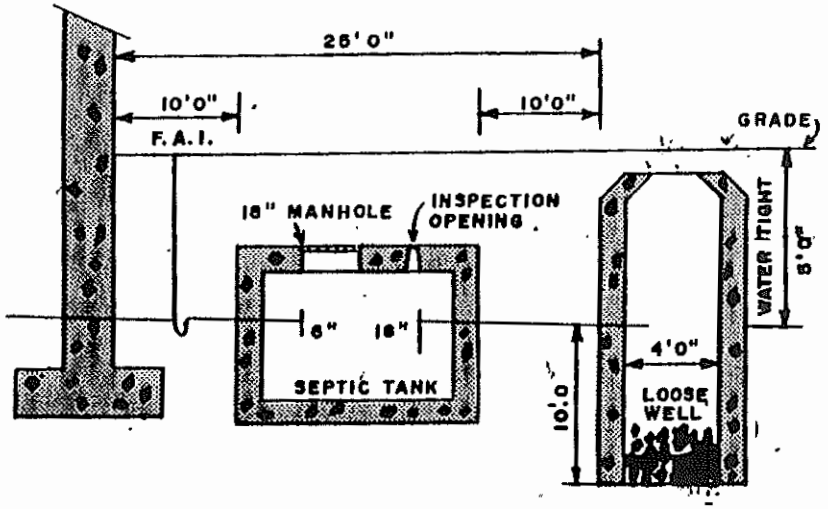
(a) Loose wells for receiving the overflow from the septic tank shall be sized in accordance with the Table II contained in §8-1411, but shall be not less than four (4) feet inside diameter arched over and provided with eighteen (18) inch cover as required in §8-1405 (3).

(b) The depth of loose wells shall be determined by the character of the soil, but in no event shall be less than ten (10) feet below the inlet pipe.

(2) Materials. Loose wells shall be constructed of approved precast reinforced concrete, eight (8) inch masonry walls of dry brick, or stone within five (5) feet of the finished surface of the ground, thence watertight from this point to the cover. A minimum of 6 inches of crushed stone or gravel shall be placed in bottom of well and the space between the loose well and the undisturbed earth shall be filled with crushed stone or gravel.

PLUMBING
RULES AND REGULATIONS

(3) Location. Loose wells shall be located in accordance with the requirements for subsurface disposal fields set forth in §8-1408 (1). The distance between two loose wells shall not be less than ten (10) feet.



§8-1413. Percolation Tests

(1) Percolation tests shall be made under the direction and supervision of the Department in the following manner.

(a) Excavate a hole to the depth of the proposed disposal trench, or loose well, in the vicinity of the installation;

(b) Thoroughly saturate the soil on the sides and bottom of hole, and while wet, fill the hole with approximately six (6) inches of water;

(c) Record the time, in minutes, required for water to completely seep away. Divide the time by the number of inches of water which has seeped away to obtain average time one (1) inch of water to seep away;

APPENDIX F

List Of Interceptors Which May Be Under Capacity Per The Design Criteria

Philadelphia Act 537
Interceptors With Potential Capacity Problems

Interceptor	Location	Height (feet)	Width/ Diameter (feet)	Length (feet)	Capacity (cfs)	Criteria (cfs)	Flow (cfs)	Percent Over Criteria
Somerset	Belfour-Castor	5.50	5.00	1799	68.05	48.20	49.67	3
Upper Frankford Low Level	Wingohocking		1.67	722	10.83	5.42	5.48	1
Lower Frankford Low	DRW/Bridge to Belgrade/		1.00	291	4.36	2.18	2.68	22
	Pratt		1.00	123	1.95	0.98	2.68	174
	Belgrade/Pratt to Wakeling/Ash		1.50	391	4.70	2.35	2.83	20
Southwest Branch	Almond-Adams to Juniata		1.25	372	4.09	2.04	3.51	71
			1.25	160	4.09	2.04	3.51	71
	Juniata to Bristol		1.25	240	2.96	1.48	3.51	137
			1.75	167	7.27	3.63	4.50	23
			1.67	268	6.99	3.50	4.50	28
			1.67	248	6.99	3.50	4.50	28
	Bristol to Orthodox		2.00	375	11.31	5.66	5.98	5
			2.00	550	11.31	5.66	5.98	5
Upper Delaware	State-Grant to Eden	6.00	5.00	883	110.76	78.27	129.32	65
	Eden to Pearson	6.00	5.00	2064	110.76	78.27	133.32	70
	Pearson to Linden	6.00	5.00	1509	102.85	72.68	133.84	84
	Linden to Pennypack	6.00	5.00	3478	102.85	72.68	135.68	86
	Pennypack to Ashburner	6.00	5.00	2269	102.85	72.68	135.68	86
	Ashburner to Pennypack	7.00	5.50	2290	154.82	109.17	142.85	30
	(Equivalent Pipe Under Creek)		3.90	168	52.63	41.25	143.08	246
	Pennypack Crk to Holmsburg	7.00	5.5	859	154.82	109.2	143.1	31

	El +115.53 to 114.85		2.50	197	23.92	18.75	22.38	19
	El +114.85 to 113.77		2.50	244	27.21	21.33	22.38	4
	El +113.77 to 113.03		2.50	236	22.84	17.90	22.38	25
	El +109.64 to 109.19		3.00	271	26.68	20.91	23.72	13
	El +52.93 to 52.46		3.50	262	41.48	32.52	35.06	7
	El +46.98 to 46.63		3.50	221	38.97	30.54	35.56	16
	El +45.09 to 44.09		3.50	491	44.99	35.27	35.56	0
	El +33.66 to 32.99		4.00	194	14.36	11.26	40.74	261
	El +27.35 to 27.27		4.00	125	35.19	27.58	41.99	52
	El +15.86 to 15.39		4.00	266	59.23	46.43	46.68	0
	El +13.56 to 13.01		4.00	318	59.23	46.43	46.96	1
	El +13.01 to 12.11		4.00	519	59.23	46.43	46.96	1
	El +10.28 to 9.81		4.00	295	55.63	43.61	49.24	12
	El +7.37 to 7.27		4.50	231	39.33	30.83	49.63	60
	El +6.28 to 6.05		4.50	144	58.99	46.24	49.94	7
			4.50	95	58.99	46.24	49.94	7
	El +6.05 to 5.91		4.50	130	62.19	48.75	49.94	2
	El +5.51 to 5.21		4.50	347	55.62	43.60	49.94	14
	El +4.37 to 3.99		4.50	351	62.19	48.75	49.94	2
	El +3.99 to 2.82		4.50	44	39.33	30.83	49.94	61
	El +2.53 to 2.24		5.00	140	26.04	20.42	52.67	157
	El +2.24 to 2.00		5.00	245	26.04	20.42	52.67	157
	El +1.82 to 1.56		5.00	577	52.09	40.83	52.67	28
	El +1.21 to 1.13		5.00	416	36.83	28.87	52.67	82
	El +0.64 to 0.66		5.00	78	26.04	20.42	53.06	159
			5.00	188	26.04	20.42	53.06	159
	El +0.66 to 0.25	3.00	5.00	24	94.59	41.84	53.06	26
		3.00	5.00	73	94.59	41.84	53.06	26
	El +0.25 to 0.25		5.00	5	26.04	20.42	53.06	159
	El +1.37 to Delaware Interceptor		6.00	613	112.05	87.83	90.36	2
Island Avenue	80th Dr.-Sta. 38+17 to Bartram		3.50	440	30.18	23.66	26.85	13
	Island Dr. - SW3.400		3.00	735	22.12	17.34	19.99	15
	80th Dr. - R/W-SW3.100		3.00	930	27.50	21.56	25.62	18

Sta. 15+7450 to M.H.	3.50	2.33	1750	34.15	23.40	28.94	23
M.H. to Gypsy La.	3.50	2.33	3400	34.15	23.40	29.02	23
Gypsy La. to M.H.	3.50	2.33	1580	34.15	23.40	29.42	25
Total Length			**97777**				
Total Length of Over Design Criteria			**20645**				

* Equivalent to 3'-7" by 2'-10" C.I.

APPENDIX G

WASTEWATER PUMPING STATION SPREADSHEET INFORMATION

17-Jun-92
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WASTEWATER PUMPING DIVISION

WASTEWATER PUMPING STATIONS		LOCATION	ADDRESS	HP	VOLT	AMPS	PH	RPM
				MOTOR DATA				
BANK STREET	1-2	Bank St. & Elbow Lane	15 S BANK ST	7.5	240	33.0	1	1735
BELFRY DRIVE	1-2	Belfry Dr. & Steeple Dr.	751 S MANATAWNA ST	15.0	230	38.0	3	1750
CSPS VARIABLE	3-4	University Ave. & 34th St. Bridge	600 UNIVERSITY AV	400.0	2300	75.8	3	600
CONSTANT	1-2-5-6			450.0	2300	86.6	3	600
FORD ROAD	1-2	Ford Rd. across from West Park Hosp.	3800 FORD AV	40.0	230	94.0	3	1770
FT MIFFLIN INF	1-2	Inside Olde Fort Mifflin	OLD FORT MIFFLIN	1.5	208	6.2	3	1750
EFF	3-4			1.5	208	5.7	3	1750
HOG ISLAND	1-2	Airport grounds east of control tower	#3 HOG ISLAND RD	40.0	480	50.0	3	1770
LINDEN AVENUE	1-2	Linden Ave. & Milnor St.	5200 LINDEN AV	15.0	230	42.0	3	870
LOCKART STREET	1-2	Lockart St. & Lockart La., in drainage R of W	10778 LOCKART RD	15.0	230	39.0	3	1760
MILNOR STREET	1-2	Milnor St. between Grant Ave. & Eden St.	9647 MILNOR ST	5.0	220	15.0	3	860
	3			5.0	220	17.0	3	860
NEILL DRIVE	1-3	Fairmount Park at Neil Dr. & Falls Rd.	4000 NEILL DR	125.0	480	150.0	3	1800
POLICE ACADEMY	1-2	Police Aca. grounds, 8501 State Rd.	8501 STATE RD	2.0	230	9.4	1	1140
RENNARD STREET	1-2	Philmont Shopping Center grounds	11064 RENNARD ST	10.0	230	29.0	3	1150
42ND STREET	1-3	42nd St. & 43rd St. intersection	761 S 43RD ST	40.0	240	108.0	3	880

STORMWATER PUMPING STATIONS		LOCATION	ADDRESS	HP	VOLT	AMPS	PH	RPM
				MOTOR DATA				
BROAD & BLVD.	1-2	Underpass at Roosevelt Blvd. & Broad St.	4251 N BROAD ST	60.0	440	77.0	3	880
	3-4			150.0	440	188.0	3	704
MINGO CREEK	A-B	Schuylkill River at the Platt Bridge	7000 PENROSE AV	50.0	550	51.0	3	1160
	1-2			500.0	550	421.0	3	450
	3-6			500.0	550	421.0	3	450
10TH AND VINE	1-3	10TH Street & Winter	1001 WINTER ST.	40.0	460	48.0	3	1200
22ND AND VINE	1-3	Underpass at Vine St & 22nd St.	22ND AND VINE STS	40.0	220	88.0	2	1160
26TH AND VARE	1-2	Underpass at Vare & 26th St.	26TH AND VARE AV	30.0	220	64.0	2	1175

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WASTEWATER PUMPING

WASTEWATER PUMPING STATIONS		WET WELL DATA: WELL W FT	WELL L FT	WELL AREA SQ FT	PUMPING SPAN LOW FT	HIGH FT	DIFF FT	PUMPED VOLUME CU FT	PUMPED VOLUME GAL/SPAN
BANK STREET	1-2	7.00	8.00	56.00	4.00	5.00	1.00	56	419
BELFRY DRIVE	1-2	6.00	6.00	36.00	5.00	7.00	2.00	72	539
CSPS VARIABLE	3-4								
CONSTANT	1-2-5-6								
FORD ROAD	1-2	11.00	12.00	132.00	4.00	7.00	3.00	396	2962
FT MIFFLIN INF	1-2	6.00	0.8	28.3	2.00	4.00	2.00	57	423
EFF	3-4	4.00	0.8	12.6	2.00	4.00	2.00	25	188
HOG ISLAND	1-2	8.00	10.00	80.00	2.00	5.00	3.00	240	1795
LINDEN AVENUE	1-2	12.00	12.00	144.00	2.00	4.00	2.00	288	2154
LOCKART STREET	1-2	11.00	12.00	132.00	4.00	7.00	3.00	396	2962
MILNOR STREET	1-2	10.00	16.00	160.00	3.00	4.00	1.00	160	1197
	3								
NEILL DRIVE	1-3	12.50	31.00	387.50	3.00	5.00	2.00	775	5797
POLICE ACADEMY	1-2	5.00	6.00	30.00	3.00	3.30	0.30	9	67
RENNARD STREET	1-2	7.00	7.00	49.00	2.00	4.00	2.00	98	733
42ND STREET	1-3	25.00	30.00	750.00	4.00	6.00	2.00	1500	11220

STORMWATER PUMPING STATIONS		WET WELL DATA: WELL W FT	WELL L FT	WELL AREA SQ FT	PUMPING SPAN LOW FT	HIGH FT	DIFF FT	PUMPING VOLUME CU FT	PUMPING VOLUME GAL/SPAN
BROAD & BLVD.	1-2	9.50	28.50	270.75	3.00	6.00	3.00	812	6076
	3-4								
MINGO CREEK	A-B	100.00	2500	250000	14.00	16.00	2.00	500000	3740000
	1-2	basin							
	3-6								
10TH AND VINE	1-3	22.00	99.00	2178.00	6.00	8.00	2.00	4356	32583
22ND AND VINE	1-3	24.50	214.50	5255.25	3.00	5.00	2.00	10511	78619
26TH AND VARE	1-2	11.25	20.00	225.00	3.00	5.00	2.00	450	3366

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WASTEWATER PUMPING

WASTEWATER PUMPING STATIONS		FLOW DEST-INATION	INFLUENT LINE SIZE	FORCE MAIN SIZE	DISC. VALVE SIZE	SUCT. VALVE SIZE	ALARM DEST-INATION	PLAT #	NO OF PUMPS	STATION TOTAL CAPACITY GPM	MGD
BANK STREET	1-2	SEWPC	6-12-8-10	4"		n/a	AUTODIALER	31	2	500	0.72
BELFRY DRIVE	1-2	SWWPC	10"	6"	4"	4"	AUTODIALER	75	2	300	0.43
CSPS VARIABLE	3-4	SWWPC	4'-2"SIPH.	8'X8'	30"	36"	OPERATOR	24-25	6	161,568	232.66
CONSTANT	1-2-5-6		& 4'-6"COLL.		30"	36"					
FORD ROAD	1-2	SWWPC	12"	12"	6"	10"	AUTODIALER	46	2	1,800	2.59
FT MIFFLIN INF	1-2	DELAWARE	4"	3"	3"	n/a	NONE	2	4	40	0.12
EFF	3-4	RIVER		3"	3"	n/a					
HOG ISLAND	1-2	SWWPC	3" & 6"	6"	4"	6"	AUTODIALER	2	2	1,000	1.44
LINDEN AVENUE	1-2	NEWPC	18"	12"	12"	12"	AUTODIALER	92	2	2,800	4.03
LOCKART STREET	1-2	NEWPC	12"	10"	10"	10"	AUTODIALER	116	2	1,200	1.73
MILNOR STREET	1-2	NEWPC	16"	15"	6"	6"	AUTODIALER	93	3	900	1.30
	3										
NEILL DRIVE	1-3	SWWPC	18"	16"	8"	12"	AUTODIALER	46	3	5,400	7.78
POLICE ACADEMY	1-2	NEWPC	10"	6"	6"	n/a	NONE	83	2	200	0.29
RENNARD STREET	1-2	NEWPC	10"	8"	6"	6"	AUTODIALER	116	2	800	1.15
42ND STREET	1-3	SWWPC	24"	16"	10"	12"	AUTODIALER	24	3	6,000	8.64

STORMWATER PUMPING STATIONS		FLOW DEST-INATION	INFLUENT LINE SIZE	FORCE MAIN SIZE	DISC. VALVE SIZE	SUCT. VALVE SIZE	ALARM DEST-INATION	PLAT #	NO OF PUMPS	STATION TOTAL CAPACITY GPM	MGD
BROAD & BLVD.	1-2	NEWPC	4'X6'	36"	12"	n/a	AUTODIALER	62	4	26,000	37.44
	3-4		3 CONDUITS		20"	n/a					
MINGO CREEK	A-B	SCHUYLKILL	RETENTION	54"	n/a	n/a	AUTODIALER	3	8	337,800	500.83
	1-2	RIVER	BASIN	conduits	n/a	n/a					
	3-6				n/a	n/a					
10TH AND VINE	1-3	SEWPC	27"	24"	16"	n/a	AUTODIALER		3	9,000	12.96
22ND AND VINE	1-3	SWWPC	42"/44"/23"	20"	12"	n/a	AUTODIALER	30	3	9,000	12.96
26TH AND VARE	1-2	SWWPC	18"	18"	8"	10"	AUTODIALER	15-20	2	4,000	5.76

APPENDIX H

Water Pollution Control Plants NPDES Permits (& Drafts)

Northeast Water Pollution Control Plant
Existing And Draft NPDES Permits

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
1875 New Hope Street
Norristown, PA 19401
215 270-1975

Call Joe Feola

A

Ci
Or
Ph

At

Re: Sewage NPDES Permit PA 0026689
City of Philadelphia Water Dept.
City of Philadelphia

Gentlemen:

Referenced permit is enclosed.

It will be necessary for you to submit a completed Discharge Monitoring Report (DMR) on a monthly basis to the appropriate agencies (see p. 5 of the NPDES permit and Other Requirements on Pg. 14).

The Environmental Protection Agency will be sending you computer generated, preprinted discharge monitoring report (DMR) forms for your submittals. In the event that these forms are not received, use the attached DMR forms. Should you find significant discrepancies between the two versions, contact this office and use the attached form until the preprinted forms are corrected. Do not allow a problem with the preprinted forms to cause your failure to submit these reports in a timely manner as this will result in violations of your permit.

In accordance with Other Requirements item G. (p. 14) please note that work is to begin on a Toxics Reduction Evaluation by November 1, 1986. The first progress report is due on May 1, 1987. For your reference, we have enclosed a copy of the "Guidelines for Conducting a Toxics Reduction Evaluation" revised October, 1985.

Please study the permit carefully and direct any questions to the Permits Section of this office.

To become operative this permit must be recorded in the Office of the Recorder of Deeds in the county in which the discharge is located. Enclosed is a certificate and pre-addressed envelope for this purpose. Please have the Recorder of Deeds accomplish the certificate and return it within ten (10) days.

Very truly yours,

Joseph A. Feola

JOSEPH A. FEOLA
Regional Water Quality Manager

ENCLOSURES: Permit
Master Discharge Monitoring Report
Recorder of Deeds Certificate with envelope
Notary Public Certificate
Guidelines for Conducting a Toxics Reduction Evaluation (Revised October, 1985)
Analytical Methods and Sample Collection, Preservation and Handling Techniques for the 126 Priority Pollutants (January 1985)
Suggested Method for the Determination of Free Cyanide (Draft) May 1984

cc: William Wankoff (Transmittal letter only)
EPA
DRBC
Permits & Compliance
Re 30 2NPDW2/

ER-RWQ-15.2 (5/81)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF WATER QUALITY MANAGEMENT

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
SEWAGE PERMIT NO. PA 0026689

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 et seq. (the "Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 et seq.,

City of Philadelphia Water Department

is hereby authorized to discharge from The Northeast Water Pollution Control Plant (Point Source 001) and 57 overflow points (Point Sources 002-058) located in th City of Philadelphia, Philadelphia County
to the receiving waters named Delaware River Zone 3 (Point Sources 001-022 and 05 Pennypack Creek (Point Sources 023-027); Tacony Creek (Point Sources 028-041); Frankford Creek (Point Sources 042-057)
in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B, and C hereof.

This permit and the authorization to discharge shall expire at midnight 8/28/91.

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amend ments and the standard or special conditions, and the terms and conditions of this permit, the terms and conditions shall apply.

2. Failure to comply with any of the terms or conditions of this permit is grounds for enforcement action; for permit termination, revocation and reissuance or modificatic or for denial of a permit renewal application.

3. It is required by law that this permit, before becoming operative, shall be recorded in the Office of the Recorder of Deeds for the county wherein the outlet of said sewer system is located.

4. Application for renewal of this permit, or notification of intent to cease discharging by the expiration date, must be submitted to the Department at least 180 days prior to the above expiration date (unless permission has been granted by the Department for submission at a later date), using the appropriate NPDES Permit Application Form. In the event that a timely and complete application for renewal has been submitted and the Department is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit will be automatically continued and will remain fully effective and enforceable pendi the grant or denial of the application for permit renewal.

5. This permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

PERMIT ISSUED

DATE 8-28-86

BY Joseph A. Feola

TITLE Joseph A. Feola

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001;
LOCATED AT LATITUDE 39°58'50.6", LONGITUDE 75°04'34.9".

A. During the period beginning at issuance and lasting through expiration, the Permittee is authorized to discharge.
B. The average monthly flow of effluent discharged from the wastewater treatment facility shall not exceed 210 million gallons per day. (a)
C. The quality of effluent shall be limited at all times as specified in Footnote (3) and as follows:

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)			CONCENTRATIONS (mg/l)						
	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE MONTHLY @210 mgd	AVERAGE WEEKLY	MAXIMUM DAILY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.1
OW (MGD)								Continuous	Recorded	
)-5 (b)	42,400	63,600		30 (24)	45		60	Daily	24 Hour Comp	
)-5 EMOVAL	DRBC Zone 3 Requirement of 86%							Daily	24 Hour Comp	
SPENDED SOLIDS	52,540	78,810		30 (30)	45		60	Daily	24 Hour Comp	
OD (c)	72,500			@210 & 1.7 = 24				2/Week	24 Hour Comp	
CAL COLIFORM -1 to 9-30)				See Footnote (2)				Daily	Grab	
CAL COLIFORM)-1 to 4-30)				Same Limits as in Footnote (2)				Daily	Grab	
	Within Limits of 6 to 9 Standard Units at all times							Daily	Grab	
3-N			MONITOR ONLY					1/Week	24 Hour Comp	
N			MONITOR ONLY					1/Week	24 Hour Comp	
3-N			MONITOR ONLY					1/Week	24 Hour Comp	
2-N			MONITOR ONLY					1/Week	24 HOur Comp	
RYLLIUM, TOTAL)&(e)			MONITOR ONLY					2/Month	24 Hour Comp	

Continue on Page 2a

Continued From Page 2

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)			CONCENTRATIONS (mg/l)						
	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.1
NC, TOTAL)				0.250			0.500	2/Month	24 Hour Comp	
ANIDE, TOTAL)&(e)				M.O N I T O R O·N L Y				2/Month	24 Hour Comp	
ANIDE, FREE)&(e)				M O N I T O R O N L Y				2/Month	24 Hour Comp	
ENOLICS (4AAP))				M O N I T O R O N L Y				2/Month	24 Hour Comp	
RYLONITRILE)&(e)						0.020		1/Month	Grab	
LOROBENZENE)				M O N I T O R O N L Y				1/Month	Grab	
LOROFORM)&(e)				M O N I T O R O N L Y				1/Month	Grab	
2 DICHLORO-ETHANE(d)						0.500		1/Month	Grab	
THYL CHLORIDE)&(e)				M O N I T O R O N L Y				1/Month	Grab	
2 TRANS-(d)&(e) CHLOROETHYLENE				M O N I T O R O N L Y				1/Month	Grab	
CHLOROPHENOL)&(e)				M O N I T O R O N L Y				1/Month	24 Hour Comp	
ICHLORO-YLENE (d)&(e)				M O N I T O R O N L Y				1/Month	Grab	

OW10/.1

Continued on Page 2b

Continued From Page 2a

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)			CONCENTRATIONS (mg/l)						
	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.1
2-CHLORO (d)& L ETHER) (e)						0.015		1/Month	24 Hour Comp	
DICHLORO-IDINE(d)&(e)				MONITOR ONLY				1/Month	24 Hour Comp	
ANTHRENE &(e)				MONITOR ONLY				1/Month	24 Hour Comp	
NE &(e)				MONITOR ONLY				1/Month	24 Hour Comp	
IA BIC &(e)						0.010		1/Month	24 Hour Comp	

(a) See Paragraph L, Other Requirements (Page 14i of 14)

(b) See Paragraph M, Other Requirements (Page 14i of 14)

(c) FSOD - First Stage Oxygen Demand (20 Day Biochemical Oxygen Demand Test with nitrogeneous oxygen demand inhibited)

(d) See Paragraph G, Other Requirements (Page 14b of 14)

(e) See Paragraph I, Other Requirements (Page 14f of 14)

NOTES: 1. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfall 001 at the Pier Effluent Sampling Building

(Footnotes Continued)

2. Effective disinfection to control disease producing organisms during the swimming season (May 1 through September 30) shall be the production of an effluent which will contain a concentration not greater than 200/100 ml of fecal coliform organisms as a geometric average value, nor greater than 1,000/100 ml of these organisms in more than 10% of the samples tested.

3. In no case shall the arithmetic means of the effluent values of the BOD_5 and Suspended Solids discharged during a period of 30 consecut days exceed 14% and 15% respectively of the associated arithmetic a of the influent values for those parameters during the same time period, except as specifically authorized by the permitting authori

D. Definitions

1. The term "bypass" means the discharge of partially treated or untreated sewage from any device or structure of sewerage facilities due to a power failure, equipment failure, hydraulic overload, and/or blockage in all or any part of the sewerage facilities. This is to distinguish it from an overflow which is the systematic discharge of a mixture of partially treated or untreated sewage and stormwater from any device or structure of combined sewerage facilities which is in excess of the downstream hydraulic carrying capacity of those facilities.

2. The term "severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does <u>not</u> mean economic loss caused by delays in production.

3. The "average monthly flow" means the arithmetic mean of daily flow measurements taken during a calendar month.

4. The "average monthly" mass discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the facility was operating. Where less than daily sampling is required by this permit, the (average) monthly mass discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made.

5. The "average weekly" mass discharge means the total discharge by weight during a calendar week divided by the number of days in the week that the facility was operating. Where less than daily sampling is required by this permit, the (average) weekly mass discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar week when the measurements were made.

6. The "maximum daily" mass discharge means the total discharge by weight during any calendar day.

7. The "average monthly" effluent concentration means the arithmetic average of all the daily determinations of concentration made during a calendar month.

8. The "average weekly" effluent concentration means the arithmetic average of all the daily determinations of concentration made during a calendar week.

9. The "maximum daily" effluent concentration means the daily determination of concentration for any calendar day.

10. The "instantaneous maximum" concentration means the concentration not to be exceeded at any time in any grab sample.

11. The "daily determination of concentration" means the concentration of a composite sample taken during a calendar day or the arithmetic average of all grab samples taken during a calendar day.

12. The term "composite sample" means a combination of individual samples obtained at regular intervals over a time period. The maximum time period between individual samples shall not exceed two hours.

13. The term "grab sample" means an individual sample collected in less than 15 minutes.

14. The term "measured flow" means any method of liquid volume measurement the accuracy of which has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.

15. The term "estimate" means to be based on a technical evaluation of the sources contributing to the discharge including, but not limited to, pump capabilities, water meters and batch discharge volumes.

16. The term "Industrial User" means an establishment which discharges or introduces industrial wastes into a Publicly Owned Treatment Works (POTW).

17. The term "Publicly Owned Treatment Works" or "POTW" means a facility as defined by Section 212 of the Clean Water Act which is owned by a State or Municipality, as defined by Section 502(4) of the Clean Water Act, including any sewers that convey wastewater to such a treatment works, but not including pipes, sewers or other conveyances not connected to a facility providing treatment. The term also means the municipality as defined in Section 502(4) of the Clean Water Act which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.

II. MONITORING AND REPORTING

A. Representative Sampling and Test Procedures

1. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Unless otherwise specified in this permit, the test procedures for analysi of pollutants shall be those contained in 40 CFR Part 136, or alternate test procedures approved pursuant to that part.

B. Self-Monitoring and Reporting Requirements

The permittee shall effectively monitor the operation and efficiency of all treatment and control facilities and the quantity and quality of the discharge. Monitoring data required by this permit shall be submitted monthly.

A Discharge Monitoring Report (DMR) properly completed and signed by the treatment plant operator in responsible charge, must be submitted within 45 days after the end of each monthly report period. Notification of the designati of the responsible operator must be submitted to the permitting agency by the permittee within 60 days after the effective date of the permit and from time to time thereafter as the operator is replaced. The DMR must be sent to the Department and the EPA Regional Office at the following addresses:

Department of Environmental Resources
Bureau of Water Quality Management
1875 New Hope Street
Norristown, Pennsylvania 19401

Pennsylvania Section (3WM52)
Permits, Water Branch
Water Division
U.S. Environmental Protection Ag
Region III
841 Chestnut Building
Philadelphia, PA 19106

C. If the permittee monitors any pollutant, using analytical methods described in Part A.2.A(2) above, more frequently than the permit requires, the results of this monitoring shall be incorporated, as appropriate, into the calculations used to report self-monitoring data on the DMR.

D. Non-Compliance Reporting

1. 24-Hour Reporting:

The permittee shall orally report to the Department within 24 hours of becoming aware of the following:

(a) Actual or anticipated non-compliance with any term or condition of this permit which may endanger health or the environment.

(b) Actual or anticipated non-compliance with any "maximum daily" discharge limitation which is identified in Part A1 of this permit as being either:

(i) A toxic pollutant effluent standard established by EPA pursuant to Section 307(a) of the Clean Water Act, or

(ii) A toxic or hazardous pollutant which, if not adequately treated, could constitute a threat to human health, welfare, or the environment,

(iii) Any pollutant identified as the method to control a toxic pollutant or hazardous substance (i.e., indicator pollutant).

(c) Any unanticipated bypass which exceeds any effluent limitations in the permit.

(d) Where the permittee orally reports this information within the above mentioned 24 hour time period, a written submission outlining the above information must be submitted to the Department within 5 days of becoming aware of such a condition, unless this requirement is waived by the Department upon receipt of the oral report.

2. Other Non-Compliance Reporting.

(a) The permittee shall give advance notice to the Department of any planned changes to the permitted activity or facility which may result in non-compliance with permit requirements.

(b) Where the permittee knows in advance of the need for a bypass which will exceed effluent limitations it shall submit prior notice to the Department at least 10 days, if possible, before date of the bypass.

(c) The permittee shall report all instances of non-compliance which are not reported above at the time of DMR submission.

3. The reports and notifications required above shall contain the following information:

(a) A description of the discharge and cause of non-compliance;

(b) The period of non-compliance, including exact date and times and/or the anticipated time when the discharge will return to compliance; and

(c) Steps being taken to reduce, eliminate, and prevent recurrence of the non-complying discharge.

E. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

1. The exact place, date, and time of sampling or measurement.
2. The person(s) who performed the sampling or measurement.
3. The dates the analyses were performed.
4. The person(s) who performed the analyses.
5. The analytical techniques or methods used.
6. The results of such analyses.

F. Records Retention

All records of monitoring activities and results (including all original strip chart recordings for continuous monitoring instrumentation and calibration and maintenance records), copies of all reports required by this permit, and records of all data used to complete the application for this permit shall be retained by the permittee for three (3) years. The three year period shall be extended as requested by the Department or the EPA Regional Administrator.

III. SCHEDULE OF COMPLIANCE

The permittee shall achieve compliance with final effluent limitations or terminate this discharge in accordance with the following schedule:

A. Feasibility study completion _____

B. Final plan completion _____

C. Start construction _____

D. Construction progress report(s) _____

E. End construction _____

F. Compliance with effluent limitations _____

G. Terminate discharge _____

No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit to the Department a written notice of compliance or non-compliance with the specific schedule requirement(s). Each notice of non-compliance shall include the following information:

A. A short description of the noncompliance.

B. A description of any actions taken or proposed by the permittee to comply with the elapsed schedule requirement.

C. A description of any factors which tend to explain or mitigate the noncompliance.

D. An estimate of the date that compliance with the elapsed schedule requirement will be achieved and an assessment of the probability that the next scheduled requirement will be met on time.

I. MANAGEMENT REQUIREMENTS

A. Publicly Owned Treatment Works (POTW)

1. Where the permittee is a Publicly Owned Treatment Works (POTW), the permittee shall provide adequate notice as discussed in A(2) below to the Department of the following:

   (a) Any new introduction of pollutants into the POTW from an Industrial User which would be subject to Sections 301 and 306 of the Clean Water Act if it were otherwise discharging directly into waters of the United States.

   (b) Any substantial change in the volume or character of pollutants being introduced into the POTW by an Industrial User which was discharging into the POTW at the time of issuance of this permit.

   (c) Any change in the quality and quantity of effluent introduced into the POTW.

   (d) The identity of significant Industrial Users served by the POTW which are subject to pretreatment standards adopted under Section 307(b) of the Clean Water Act; the POTW shall also identify the character and volume of pollutants discharged into the POTW by the Industrial User.

2. The submission of the above information in the POTW's annual Wasteload Management Report, required under the provisions of 25 Pa. Code Chapter will normally be considered as providing adequate notice to the Department However, if the above changes in industrial pollutant loadings to the POTW are significant enough to warrant either modification or revocation and reissuance of this permit, then the permittee is required to meet the provisions of Management Requirements B below.

3. The POTW shall require all Industrial Users to comply with the reporting requirements of Sections 204(b), 307, and 308 of the Clean Water Act and any regulations adopted thereunder, and the Clean Streams Law and any regulations adopted thereunder.

B. Permit Modification, Termination, or Revocation and Reissuance

1. This permit may be modified, terminated, or revoked and reissued during its term for any of the causes specified in 25 Pennsylvania Code, Chapter 9

2. The filing of a request by the permittee for a permit modification, revocati and reissuance, or a notification of planned changes or anticipated non-compliance does not stay any permit condition.

3. Notwithstanding the above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for toxic pollutant which is present in the discharge authorized herein and such standard or prohibition is more stringent than any limitation upon such pollutant in this permit, this permit shall be modified or revoked and reissued in accordance with the toxic effluent standard or prohibition and the permittee shall be so notified.

In the absence of a Departmental action to modify or to revoke and reissue this permit, any toxic effluent standard or prohibition established under Section 307(a) of the Act is considered to be effective and enforceable against the permittee.

C. Right of Entry

Pursuant to Sections 5(b) and 305 of Pennsylvania Clean Streams Law and 25 Pennsylvania Code, Chapter 92, the permittee shall allow the head of the Department, the EPA Regional Administrator, and/or their authorized representatives, upon the presentation of credentials:

1. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit.

2. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit and other documen as may be required by law.

3. To inspect at reasonable times any monitoring equipment or monitoring method required in this permit.

4. To inspect any collection, treatment, pollution management, or discharge facilities required under the permit.

5. To sample any substances or parameters at any location.

D. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges; nor does it authorize any injury to private property or any invasion of personal rights.

E. Duty to Provide Information

1. The permittee shall furnish to the Department within a reasonable time, any information which the Department may request to determine whether cause exists for modifying revoking and reissuing, or terminating this permit, or to determine compliance with this permit.

2. The permittee shall furnish to the Department, upon request, copies of records required to be kept by this permit.

3. Planned changes: The permittee shall give advance notice to the Department of any physical alterations or additions to the permitted facility.

4. Other Information: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information to the Department.

F. Confidentiality

Except for data determined to be confidential under 25 Pennsylvania Code, Chapter 92, all required reports shall be available for public inspection at the offices of the Department and the EPA Regional Administrator. Effluent data shall not be considered confidential.

G. Facility Operation and Quality Control

The permittee shall at all times maintain in good working order and properly operate all facilities and systems (and related appurtenances) for collection and treatment which are installed or used by the permittee for water pollution control and abatement to achieve compliance with the terms and conditions of the permit. Proper operation and maintenance includes but is not limited to effective performance based on designed facility removals, adequate funding, effective management, adequate operator staffing and training, and adequate laboratory and processing controls including appropriate quality assurance procedures. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with this permit.

H. Bypassing

1. Bypassing Not Exceeding Permit Limitations: The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if the bypass is for essential maintenance to assure efficient operation. This type of bypassing is not subject to the reporting and notification requirements of Part A.2.D above.

2. In all other situations, bypassing is prohibited unless the following conditions are met:

   (a) A bypass is unavoidable to prevent loss of life, personal injury or "severe property damage";

   (b) There are no feasible alternatives to a bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment down-time; (This condition is not satisfied if the permittee could have installed adequate backup equipment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance.); and

   (c) The permittee submitted the necessary reports required under Part A.2. above.

3. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the conditions listed under Part B.I.2. above.

I. Adverse Impact

Permittee shall take all reasonable steps to minimize any adverse impact on the environment resulting from noncompliance with this permit.

J. Solids Disposal

Collected screenings, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those waters (or runoff from the wastes) into waters of the Commonwealth.

K. Penalties and Liability

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

2. Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for non-compliance pursuant to Section 309 of the Clean Water Act or Sections 602 or 605 of the Clean Streams Law.

L. Transfer of Ownership or Control

1. No permit may be transferred unless approved by the Department.

2. In the event of any pending change in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the Department by letter of such pending change at least thirty days prior to the change in ownership or control.

3. The letter shall be accompanied by the appropriate Department forms for transfer of the permit and a written agreement between the existing permittee and the new owner or controller stating that the existing date of permit transfer and that the new owner or controller shall be liable for permit violations from that date on.

4. After receipt of the documentation above, the Department shall notify the existing permittee and the new owner or controller of its decision concerning approval of the transfer. In approving a transfer the Department may modify or revoke and reissue the permit.

5. In the event the Department does not approve transfer of the permit, the new owner or controller must submit a new permit application.

M. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

N. Other Laws

Nothing herein contained shall be construed to be an intent on the part of the Department to approve any act made or to be made by the permittee inconsistent with the permittee's lawful powers or with existing laws of the Commonwealth regulating sewerage discharge and the practice of professional engineering, nor shall this permit be construed to sanction any act otherwise forbidden by federal or state law or regulation, or by local ordinance. Nor does it pre-empt any duty to obtain State or local assent required by law for the discharge(s).

PART C

OTHER REQUIREMENTS

A. Effluent limitations, monitoring requirements, and other standard and special conditions which relate to the discharge(s) of pollutants authorized by this permit and which are contained in Water Quality Management Permit(s)

No. 5172405, 761538, 8208 issued on August 4, 1972, August 24, 1961, December 13, 1951

are superseded by the terms and conditions of this permit, unless specifically noted otherwise herein..

B. A copy of the Discharge Monitoring Report is to be sent to the following agency:

Delaware River Basin Commission
P.O. Box 7360
West Trenton, New Jersey 08628

C. For reporting purposes on the Discharge Monitoring Report, the term "average weekly" shall mean the highest average weekly value observed during the monthly monitoring period.

D. If, in the opinion of the Department, the sewage treatment plant is no so operated or if by reason of change in the character of the waste or increased load upon the sewage treatment plant, or changed use or condition of the receiving body of water, or otherwise, that the effluent ceases to be satisfactory or the sewage treatment plant creates a public nuisance, then upon notice by the Department the right herein granted to discharge such effluent shall cease and become null and voi unless within the time specified by the Department, the permittee shal adopt such remedial measures as will produce an effluent which, in the opinion of the Department, will be satisfactory for discharge into the receiving body of water.

E. The BOD_5 in the raw wastewater shall be reduced by at least 86% as a monthly average in accordance with the requirements of the Delaware River Basin Commission for Zone 3 of the Delaware Estuary. The percen removal shall be calculated from daily 24 hour composite sampling of the influent and effluent. The influent sample must reflect true characteristics of the raw wastewater and must not be affected by plan recycle flows.

F. The following requirements shall apply with regard to implementation o the required industrial pretreatment program.

(a) The permittee shall operate an industrial pretreatment program in accordance with Section 402(b)(8) of the Clean Water Act and the General Pretreatment Regulations (40 CFR Part 403). The program shall also be implemented in accordance with the approved POTW pretreatment program submitted by the permittee.

PART C

OTHER REQUIREMENTS

(b) The permittee shall submit to EPA and DER an annual report that describes the permittee's program activities over the previous 12 months. The permittee must also report on the pretreatment program activities of all participating agencies, if more than one jurisdiction is involved in the local program.

(c) The report shall be incorporated into and submitted with the permittee's annual Municipal Wasteload Management report required by DER's Chapter 94 Rules and Regulations. The report shall include the following:

1) Compliance with Categorical and Local Standards - A summary of the compliance status for those industries affected by final Categorical Pretreatment Standards.

2) Review of Industrial Compliance - Information on the number and type of major violations of pretreatment regulations, and the actions taken or planned by the POTW to obtain compliance.

3) Summary of Industrial User Inspections - A summary of the number and type of industrial user inspections by the POTW.

4) Summary of POTW Operations - Any interference, upset, or permit violations experienced at the POTW directly attributable to industrial users, and actions taken to alleviate said events. Sampling and analysis of POTW influent, effluent, and sludge for toxic and incompatible pollutants shall also be included.

5) Pretreatment Program Changes - A description of any significant changes in operating the program from the original submission, including staffing and funding. An updated industrial survey shall be included, as appropriate.

6) Other Miscellaneous Pretreatment Developments - POTW facility changes, problems or improvements regarding sludge, water quality, data management, or any special concerns.

(d) EPA and DER retain the right to require the POTW to institute changes to its local pretreatment program:

1) If the program is not implemented in a way satisfying the requirements of 40 CFR 403;

2) If problems such as interference, pass through, or sludge contamination develop or continue;

3) If other Federal, State or local requirements (i.e., water quality standards) change.

PART C

OTHER REQUIREMENTS

C. Water Quality-Based Effluent Limitations and Other Requirements for Management of Toxic Pollutants

a. Water Quality-Based Effluent Limitations

In addition to the effluent limitations shown in Part A of this permit, the Permittee is expected to achieve the water quality-based effluent limitations shown below.

No final date for compliance with these limitations is shown. The Department will modify this permit to establish a final compliance date, if necessary, upon the submittal by the Permittee and review by the Department of an acceptable Toxics Reduction Evaluation (TRE), or the failure of the Permittee to submit an acceptable TRE under the schedule established under Section G.b. of this Part C. The Permittee must submit the following requests, along with supporting documentation, to the Department at the time of submission of the TRE:

(1) A request for modification of water quality-based effluent limitations shown below; and/or,

(2) A request for an extension of time to achieve the water quality-based effluent limitations shown below; and/or,

(3) A request for alternative bioassay-based effluent limitations.

For purposes of compliance, effluent limitations listed in Part A of this permit apply unless changed by order, permit modification or other Department action.

Submittal by the Permittee of a TRE shall not be deemed to affect the appeal rights of the Permittee of final water quality-based effluent limitations upon action of the Department to make the limitations effective.

PART C

OTHER REQUIREMENTS

Outfall 001

Parameter	Units	Average Monthly	Maximum Daily	Instantaneous Maximum
Beryllium	mg/l	0.00025		0.0005
Zinc	mg/l	0.161		0.322
Cyanide, Total	mg/l	0.444		0.888
Cyanide, Free	mg/l	0.0111		0.0222
Phenolics (4AAP)	mg/l	0.0117		0.0234
Acrylonitrile	mg/l		0.0029	
Chlorobenzene	mg/l		0.099	
Chloroform	mg/l		0.0005	
1,2 Dichloroethane	mg/l		0.0465	
Methyl Chloride	mg/l		0.0094	
Trichloroethylene	mg/l		0.0083	
1,2 Trans-Dichloroethylene	mg/l		0.0025	
2-Chlorophenol	mg/l		0.0005	
Bis(2 Chloroethylether)	mg/l		0.0015	
Phenanthrene	mg/l		Not Detectable	
Pyrene	mg/l		Not Detectable	
Alpha BHC	mg/l		0.00046	
3,3'Dichlorobenzidine	mg/l		0.0005	

b. Toxics Reduction Evaluation (TRE)

In order to (1) verify the actual extent of the toxic pollutants associated with the wastewater, (2) determine sources of these toxic pollutants, and (3) recommend control and/or treatment technologies to reduce or eliminate these toxic pollutants, the Permittee is directed to carry out a Toxics Reduction Evaluation (TRE) in accordance with guidelines developed by the Department.

PART C

OTHER REQUIREMENTS

The Permittee shall submit three (3) copies of the completed TRE to the Department for review in accordance with the following schedule:

Step	Date
Begin Work on the TRE and so Notify the Department	11/01/86
Submit a Progress Report to the Department	05/01/87
Submit a Progress Report to the Department	11/01/87
Submit a Progress Report to the Department	05/01/88
Submit the Completed TRE to the Department	11/01/88

c. Modification of Permit to Incorporate Water Quality-Based Effluent Limitations for Toxic Pollutants

Upon approval of the TRE and any additional submittals for the above toxic pollutants of concern, the Department will modify Part A of this permit to reflect the effluent limitations, monitoring requirements, and other conditions necessary for compliance with water quality standards.

A permit modification may include a schedule of compliance. Any such permit modification will be conducted in accordance with applicable permit modification procedures, which include development of draft and final permits and associated public notification requirements.

d. Procedures for Granting Extensions of Time to Achieve Water Quality-Based Effluent Limitations

At the request of the Permittee, in conjunction with modifying the permit to incorporate water quality-based effluent limitations under Subsection c. above, the Department may grant an extension of time to achieve the water quality-based effluent limitations shown in Subsection a. above, provided the Permittee meets all of the eligibility requirements contained in Section 95.4 of the Department's Rules and Regulations.

Requests for Section 95.4 time extension, including all documentation required to support such a request, must be submitted to the Department along with the Permittee's TRE as required under Subsection b. above.

PART C

OTHER REQUIREMENTS

e. Procedures for Demonstration of Alternative Site-Specific Bioassay-Based Effluent Limitations

Where the water quality-based effluent limitations listed in this Part C have been developed by the Department for protection of fish and aquatic life, the Permittee may request an opportunity to demonstrate alternative, site-specific, bioassay-based "safe concentration values" for the pollutants in question.

The following water quality-based effluent limitations in this Part C are based on protection of fish and aquatic life:

Zinc

The procedures for carrying out such demonstrations shall be approved in writing by the Department, and shall be conducted in accordance with the requirements of Sections 93.8(d)-(e) of the Department's Rules and Regulations.

Requests for alternative, site-specific, bioassay-based effluent limitations, including all documentation required to support such a request, must be submitted to the Department along with the Permittee's TRE as required under this Part C.

Where the demonstration results in more stringent limitations than those established by the Department in this Part C, the more stringent limitations will apply. Any less stringent limitations which are approved by the Department shall not violate applicable criteria for the protection of human health. This procedure does not apply to those parameters for which specific numeric criteria are listed in Section 93.7, Table 3 of the Department's Rules and Regulations.

H. The approval herein given is specifically made contingent upon the permittee acquiring all necessary property rights by easement or otherwise, providing for the satisfactory construction, operation, maintenance and replacement of all sewers or sewerage structures associated with the herein approved discharge in, along, or across private property, with full rights of ingress, egress and regress.

PART C

OTHER REQUIREMENTS

I. Analysis for the following pollutant(s) shall be performed using the following test method(s) contained in the EPA publication entitled Methods for Chemical Analysis of Water and Wastes, or any approved test method(s) of equal or greater sensitivity.

Beryllium	EPA Method 210.2 (A.A., Furnace)
Cyanide, Total	EPA Method 335.2 (Spectrophometric)
Cyanide, Free	(See Suggested DER Method for Determination of Free Cyanide (Draft) 5/84)
Acrylonitrile	EPA Method 603 (GC with FID)
Chloroform	EPA Method 601 (GC/Hal.)
Methyl Chloride	EPA Method 601 (GC/Hal.)
1,2-trans-Dichloroethylene	EPA Method 624 (GC/MS)
2-Chlorophenol	EPA Method 604 (GC/FID)
Trichloroethylene	EPA Method 624 (GC/MS)
Bis (2-Chloroethyl Ether)	EPA Method 611 (GC/Hal.)
Phenanthrene	EPA Method 610 (HPLC)
Pyrene	EPA Method 610 (HPLC)
3,3' Dichlorobenzidine	EPA Method 605 (HPLC)
Alpha BHC	EPA Method 608 (GC/ECD)

J. Point Sources 002 through 058 (listed below) serve as combined sewer reliefs necessitated by stormwater entering the sewer system and exceeding the hydraulic capacity of the sewers and/or the treatment plant and are permitted to discharge only for such reason. There are at this time no specific effluent limitations on these discharges. The regulating chambers shall be maintained in operable condition including regular monitoring and inspection of regulator controls within the combined sewer system and prompt repair or replacement of malfunctioning regulator controls. Results of the inspections (Interceptors Services Report) shall be submitted monthly as part of the Discharge Monitoring Report.

Discharges to Delaware River

Point Source	Interceptor Regulator Name	Location	
	Somerset Collector		
002	Castor Avenue (D-17)	39°58'52"N	75°04'58"W
003	Venango Street (D-18)	39°58'51"N	75°05'10"W
004	Tioga Street (D-19)	39°58'50"N	75°05'21"W
005	Ontario Street (D-20)	39°58'47"N	75°05'31"W
006	Westmoreland Street (D-21)	39°58'44"N	75°05'40"W
007	Allegheny Avenue (D-22)	39°58'39"N	75°05'49"W

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OTHER REQUIREMENTS

Point Source	Interceptor Regulator Name		Location	
008	Indiana Avenue	(D-23)	39°58'38"N	75°06'11"W
009	Cambria Street	(D-24)	39°58'35"N	75°06'25"W
010	Somerset Street	(D-25)	39°58'35"N	75°06'25"W
	Upper Delaware Collector			
011	Cottman Street	(D-2)	40°01'20"N	75°01'46"W
012	Princeton Avenue	(D-3)	40°01'13"N	75°02'00"W
013	Disston Street	(D-4)	40°01'07"N	75°02'13"W
014	Magee Street	(D-5)	40°00'58"N	75°02'35"W
015	Levick Street	(D-6)	40°00'53"N	75°02'47"W
016	Lardner Street	(D-7)	40°00'45"N	75°03'05"W
017	Comly Street	(D-8)	40°00'38"N	75°03'12"W
018	Dark Run Lane	(D-9)	40°00'34"N	75°03'18"W
019	Sanger Street	(D-11)	40°00'21"N	75°03'27"W
020	Bridge Street	(D-12)	40°00'02"N	75°03'42"W
021	Kirkbridge Street	(D-13)	39°59'52"N	75°03'47"W
022	Orthodox Street	(D-15)	39°59'24"N	75°04'04"W
Discharges to Pennypack Creek				
	Upper Pennypack Collector System			
023	Frankford Avenue & Ashburner Street	(P-1)	40°02'37"N	75°01'15"W
024	Frankford Avenue & Holmesburg Street	(P-2)	40°02'37"N	75°01'16"W
025	Torresdale Avenue N.W. of Pennypack Creek	(P-3)	40°02'13"N	75°01'19"W
026	Cottage Avenue & Holmesburg Avenue	(P-4)	40°02'22"N	75°01'21"W
027	Holmesburg Avenue S.E. of Hegerman Street	(P-5)	40°02'01"N	75°01'21"W
Discharges to Tacony Creek				
	Frankford High Level Collector System			
028	Williams Avenue S.E. of Sedgewick	(T-1)	40°04'36"N	75°09'32"W
029	Champlost Avenue W. of Tacony Creek	(T-3)	40°02'30"N	75°07'04"W
030	Rising Sun Avenue E. of Tacony Creek	(T-4)	40°02'12"N	75°06'48"W

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Point Source	Interceptor Regulator Name	Location	
031	Rising Sun Avenue W. of Tacony Creek (T-5)	40°02'09"N	75°06'48"W
032	Bingham Street E. of Tacony Creek (T-6)	40°02'03"N	75°06'41"W
033	Tabor Road W. of Tacony Creek (T-7)	40°01'51"N	75°06'42"W
034	Ashdale Street W. of Tacony Creek (T-8)	40°01'41"N	75°06'46"W
035	Roosevelt Blvd. W. of Tacony Creek (T-9)	40°01'37"N	75°06'48"W
036	Roosevelt Blvd. E. of Tacony Creek (T-10)	40°01'37"N	75°06'47"W
037	Ruscomb Street E. of Tacony Creek (T-11)	40°01'28"N	75°06'42"W
038	Witaker Avenue E. of Tacony Creek (T-12)	40°01'23"N	75°06'42"W
039	Witaker Avenue W. of Tacony Creek (T-13)	40°01'22"N	75°06'42"W
040	I Street & Ramona Avenue (T-14)	40°00'58"N	75°06'27"W
041	J Street & Juniata Pk. (T-15)	40°00'57"N	75°06'19"W

Discharges to Frankford Creek

Upper Frankford Creek Low Level

042	Castor Avenue at Unity Street (Circle) (F-3)	40°00'57"N	75°05'51"W
043	Wingohocking Street E. of Adams Avenue (F-4)	40°00'53"N	75°05'41"W
044	Bristol Street W. of Adams Avenue (F-5)	40°00'40"N	75°05'41"W
045	Worrel Street E. of Frankford Creek (F-6)	40°00'26"N	75°05'32"W
046	Worrel Street W. of Frankford Creek (F-7)	40°00'26"N	75°05'34"W
047	Erie Avenue & Hunting Park Avenue (F-8)	40°00'21"N	75°05'36"W
048	Frankford Avenue N. of Frankford Creek (F-9)	40°00'20"N	75°05'34"W
049	Frankford Avenue S. of Frankford Creek (F-10)	40°00'19"N	75°05'35"W
050	Paul Street S. of Vandyke Street (F-11)	40°00'15"N	75°05'25"W
051	Sepviva Street N. of Butler Street (F-12)	39°59'55"N	75°05'13"W

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OTHER REQUIREMENTS

Point Source	Interceptor Regulator Name		Location	
	Lower Frankford Creek Low Level			
052	Duncan Street (under Del. Exp.)	(F-13)	40°00'15"N	75°04'57"W
053	Bristol Street(cemetary)	(F-14)	40°00'15"N	75°04'57"W
054	Wakeling Street N.W. of Creek Basin	(F-21)	40°00'15"N	75°04'57"W
055	Bridge Street N.W. of Creek Basin	(F-23)	40°00'18"N	75°04'05"W
056	Bridge Street S.E. of Creek Basin	(F-24)	40°00'19"N	75°04'05"W
057	Ash Street West of Creek Basin	(F-25)	40°00'15"N	75°04'51"W
	Discharges to Delaware River			
	Upper Delaware Collector			
058	Wakeling Street Relief Sewer		40°00'29"N	75°03'19"W

K. The permittee shall operate the sewage treatment plant to provide treatment for the maximum design wastewater flows of 315 MGD (maximum daily average) and 420 MGD (peak) without causing treatment process upsets. Throttling of influent flows to the plant resulting in avoidable, premature sewer system overflows is prohibited.

L. An average monthly flow in excess of 210 MGD shall not be considered to be a violation of this permit.

M. The mass limitation for BOD_5 shall not become effective until January 1, 1989. During the period January 1, 1987 through December 31, 1987 influent data (without impact of recycle streams) and effluent data shall be collected relative to BOD_5 (uninhibited) on a daily basis and First Stage Oxygen Demand (FSOD) on a twice per week basis. This data base will be used to determine whether the existing FSOD allocation, the equivalent BOD_5 mass effluent limitation and/or the current $FSOD/BOD_5$ ratio should be revised. Progress reports shall be submitted to the Delaware River Basin Commission and the Department by April 30, 1987 and September 30, 1987. A final report shall be submitted to the same agencies on or before March 31, 1988.

Additional Instructions for Utilizing
The
National Pollutant Discharge Elimination System
DISCHARGE MONITORING REPORT

The attached originals of the NPDES Discharge Monitoring Report have been provided to you as a master. The permit establishes specific effluent monitoring and reporting requirements and these values are repeated on the origina Discharge Monitoring Report provided for you. The "N/A" placed in the permit condition block of the Discharge Monitoring Report indicates one of two things (1) that the parameter is monitored but no limitations are imposed, and the pe tinent value must be reported; or (2) that the parameter is limited elsewhere the Discharge Monitoring Report, and the value should be reported if it is available.

Your reports are to be submitted by utilizing copies of the attached forms Do not write on or send the attached originals, but rather: (1) make copies o them, (2) fill out the copies as appropriate, (3) make the necessary copies of the completed (filled out) form, and (4) submit these copies to the appropriat EPA and State Offices as provided in the permit.

3W347.3

MEMORANDUM

CITY OF PHILADELPHIA

DATE 2/11/88

C : Master Consent Decree Circulation List

M : Pamela Foa, Divisional Deputy City Solicitor

RE: Consent Decree Filing

Please be advised that the Consent Decree Amendment was filed with the Court today and should become effective in 30 days, i.e., March 12, 1988.

PF/rf

cc: Seymour Kurland
Henry Diamond

RITA
Please make copies for:
- MSC
- J. Coyne
- A Fagerstrom

-1 (Rev. 3/59) RESPONSE TO THIS MEMORANDUM MAY BE MADE HEREON IN LONGHAND

CONSENT DECREE MASTER CIRCULATION LIST

1. William J. Marrazzo
2. Patrick R. Cairo
3. Kumar Kischinchand
4. Ronald Coy
5. Joan Fredette
6. Bruce Aptowicz
7. William Wankoff
8. Dick Roy
9. Bob Wilkinson
10. Faulkner Edmonds
11. Tom Healey
12. Gene Gruber

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

CITY OF PHILADELPHIA,	:	
	:	
Plaintiff,	:	
	:	CIVIL ACTION NOS.
v.	:	78-878, 78-1732,
	:	78-1733, 78-1851
EPA, et al.,	:	
	:	
Defendants.	:	

AMENDMENT

This Amendment amends a Consent Decree approved and entered by the Court herein on September 26, 1979 ("Consent Decree"). Except to the extent of provisions herein to the contrary, the parties agree that the Consent Decree and its stipulations prior to the date of entry of this Amendment shall remain in full force and effect.

Petitioner United States of America, on behalf of the United States Environmental Protection Agency ("EPA"), filed a Contempt Petition on August 8, 1986, against Respondent City of Philadelphia ("City"), a municipal corporation of the Commonwealth of Pennsylvania, alleging violation of various provisions of the Consent Decree. The City cross-filed a Motion for Resolution of Disputes under the Consent Decree on September 2, 1986 alleging that it had complied with the provisions of the Consent Decree and seeking return to the City of interest income accumulated in the Philadelphia Environmental Trust Fund ("Trust Fund").

The United States also alleged that added elements of construction were needed for the City's Northeast Water Pollution Control Plant ("Northeast Plant") to meet final effluent limitations on a permanent and consistent basis and to permit treatment of design flows. The City argued that construction undertaken to date permitted the Northeast Plant to achieve secondary treatment but not reliably to maintain it. The City concurs that additional elements should be constructed to assure consistent compliance and to permit treatment of design flows, and to improve solids handling capabilities at all three of the City's water pollution control plants.

Even though they agree on the incomplete status of the Northeast Plant, the parties have agreed that in the interest of maintaining the highest level of water quality, all effluent limitations contained in Part A of the NPDES permit and in effect at the time of entry of this Amendment shall remain in effect during the term of this Amendment until termination under Section XI(A). The parties agree that the incomplete status of the Northeast Plant and of the sludge handling facilities will be considered in evaluating any violation of those effluent limitations.

The parties agree that settlement of these matters without further litigation is in the public interest and that entry of this Amendment is the most appropriate means of resolving these matters.

NOW, THEREFORE, without admitting liability and without trial of any issue of fact or law, and upon the consent of the parties, by their attorneys and authorized officials, it is hereby ORDERED, ADJUDGED and DECREED as follows:

I.

JURISDICTION

This Court has jurisdiction of the subject matter and of the Parties consenting hereto for the purpose of entering this Amendment to the Consent Decree.

II.

APPLICABILITY AND EFFECT

A. The provisions of this Amendment shall apply to and be binding upon the parties hereto, their respective elected and appointed officials, officers, directors, agents, servants, employees, successors, assigns and attorneys, and upon all those persons, firms and corporations acting under, through or for them, and upon those persons, firms and corporations in active concert or participation with them.

B. This Amendment constitutes a full and complete settlement of all civil claims asserted in the United States' Contempt Petition filed August 8, 1986, or which could have been asserted in that Petition with respect to the Northeast Plant under the 1979 Consent Decree, all civil claims asserted in the City's Motion for Resolution of Disputes filed September 2, 1986, and

all claims expressly reserved in the stipulation filed December 15, 1983 regarding the City's Southwest Water Pollution Control Plant. It is understood and agreed that the City's Southwest Plant is released from the provisions of Paragraph V of the 1979 Consent Decree, and from all liability under or resulting from that paragraph. This Amendment in no way affects the rights, responsibilities and remedies of the parties under any NPDES permit for the Southwest Plant, or any proceedings relating to any such permit.

C. The parties understand that this Amendment alters the underlying Consent Decree only as it may do so by specific language. All applicable provisions of the underlying Consent Decree which are not specifically altered by agreement of the parties in this Amendment remain in full force and effect.

III.

COMPLIANCE WITH OTHER LAWS

A. This Amendment is not and shall not be interpreted to be a permit, or a modification of an existing permit, under Section 402 of the Clean Water Act, 33 U.S.C. § 1342. Any new permit, or modification of the existing permit, must be issued in accordance with applicable federal and state laws and regulations.

B. All effluent limitations contained in Part A of the NPDES permit for the Northeast Plant shall be regulated by this Amendment until the occurrence of the events described in Section XI(A). In all other respects, the City shall comply with the terms and conditions of the Clean Water Act, NPDES Permit No. PA0026689, and any modifications or reissuance of this permit or any subsequently issued permit governing the Northeast Plant, and any other federal or state law pertaining thereto; provided, however, that the United States and the state will seek no penalties or contributions to the Trust Fund other than those provided in this Amendment for any violation of final effluent limitations at the Northeast Plant, occurring prior to the occurrence of the events described in Section XI(A); that the United States and the state will seek no penalties or contributions to the Trust Fund other than those provided in this Amendment for any violation of any compliance schedule established in Section IV of this Amendment, until termination under Section XI(B); and provided further that the parties understand that certain provisions of the permit are under appeal, that these provisions may be suspended during that appeal, and that as a result of the appeal these provisions of the permit may be deleted or changed. This Amendment shall have no effect on any permit appeal, except as specifically provided herein.

IV.

REHABILITATION AND CONSTRUCTION COMPLETION

A. With respect to the following project segment at the Northeast Plant, the City shall comply with the following schedule:

	Construction Completion	On Line and In Operation
Final Tank Modifications	6/1/89	6/1/90

B. With respect to the following project segments which will provide treatment for the sludge produced by the Northeast Plant as well as the City's Southeast and Southwest Water Pollution Control Plants, the City shall comply with the following schedule:

	Construction Completion	On Line and In Operation
Sludge Composting	10/15/88	10/15/89
Sludge Dewatering	8/1/89	8/1/90
Sludge Transport System	5/1/89	8/1/90*

* The parties recognize that the Sludge Transport System cannot be demonstrated to be On Line and In Operation until the Sludge Dewatering project segment is placed in operation at sufficient capacity to process all sludge transported under the Sludge Transport System On Line and In Operation Test.

C. With respect to the schedules set forth in subsections (A) and (B), above, the following definitions shall apply:

1. "Construction Completion" is achieved when all essential components of a project segment have been installed and when that project segment is ready to be tested by the contractor, regardless of when it has in fact been tested.

2. "On Line and In Operation" shall, with respect to each project segment identified in subsections (A) and (B), above, be defined as provided in Exhibit A to this Amendment.

3. The "Sludge Transport System" is defined to include the following elements: Northeast Sludge Transfer Station, Two Sludge Barges, and Docking Facilities at both the Northeast and Southwest Plants.

D. The City shall complete the rehabilitation and construction project segments identified in subsections (A) and (B), above, according to the schedules contained therein, subject to any extensions granted pursuant to the Consent Decree or this Amendment.

E. Throughout the period of this Amendment, the City shall use best efforts to comply with all final effluent limitations. EPA and the City recognize that flows may currently be limited due to the hydraulic restrictions resulting from the rehabilitation of the existing final tanks. Until such rehabilitation is completed, the City shall use best efforts to treat all flows to the Northeast Plant, consistent with those hydraulic restrictions. Once rehabilitation of the Final Tanks is completed, the City will use best efforts to treat all flows up to design capacity, consistent with the City's efforts to bring the rehabilitated Final Tanks On-Line and In Operation.

F. Bypassing is prohibited except in accordance with the provisions of the NPDES permit as stated in paragraph H(2) of Part B and upon application to and approval by the Delaware River Basin Commission (DRBC) if it can be reasonably anticipated that DRBC water quality standards or effluent limitations would be violated. Reporting of such bypasses shall be in accordance with those provisions.

In addition to the reporting requirements in the permit, the following additional information shall be reported for any throttling incidents that result in bypass at the time of the DMR submission:

1) Date of each incident,

2) Time and duration of each throttling incident or the time and duration of the bypass itself if that information is available for the specific period of the bypass.

3) Plant flow rate at both the beginning and the end of the throttling incident or the flow rate at the beginning and end of the bypass if that information is available for the specific period of the bypass, and

4) The basis for the need to throttle at the reported flow rate during each throttling incident.

V.

PHILADELPHIA ENVIRONMENTAL TRUST FUND

In recognition of the Trust Fund as a unique and extraordinary

vehicle for funding environmentally beneficial projects, and because of their mutual interest in promoting the City's water pollution abatement program and in accomplishing environmentally beneficial projects relating to water or wastewater treatment, the parties understand and agree as follows:

A. The City argues that the City is authorized to use the interest which has accrued in the Trust Fund to pay any penalties owed by the City under the Consent Decree. The United States argues that the City must deposit additional sums representing any penalties into the Trust Fund, and that all interest must be used for environmentally beneficial projects relating to water or wastewater treatment. The parties now agree that the current interest balance in the Trust Fund, which is in excess of $2,300,000, will be expended for the environmentally beneficial projects described in Exhibit B..

Upon entry of this Amendment, there shall be released to the City from the Trust Fund the sum of $1,351,100 to carry-out the Trust Fund project listed as Exhibit B(1). The balance of the interest shall be made available to the City as costs are incurred on the projects.

B. Upon entry of this Amendment the City will make an additional contribution of $240,000 to the Trust Fund to carry out the environmentally beneficial project described in Exhibit C.

C. Hereafter, all accumulations of interest income in the Trust Fund shall be deemed to constitute principal and shall be used for environmentally beneficial projects.

D. It is understood and agreed that with respect to payments for Trust Fund projects listed in Exhibit B 2-6, and Exhibit C, the City shall, upon receipt of any billing or invoice pertaining to any such project, examine and certify to the trustee the accuracy of said billing or invoice, whereupon the trustee shall release funds from the Trust Fund in the amount certified in direct payment of such billing or invoice.

E. The City shall submit to EPA on an annual basis a report specifying the balance of monies in the Trust Fund, the amount of monies withdrawn from the Trust Fund during the previous year, the amount of money expended on each Trust Fund project and the progress the City has made during the previous year towards completing the Trust Fund projects.

VI.

ADDITIONAL CONTRIBUTIONS TO THE TRUST FUND

A. Construction Schedule

If the City fails to comply with any schedule contained in Section IV(A) or (B) of this Amendment, upon demand by EPA, the City shall incur stipulated penalties or draw upon credit available under Section VI(F)(2) in the following amounts for each violation of each applicable requirement in accordance with the following schedule:

Period of Non-Compliance	Penalty Per Day
1st day to 60th day	$100
61st day to 120th day	$300
121st day to 180th day	$1,000
181st day to 300th day	$5,000
Each day beyond the 300th day	$10,000

B. If the City incurs a stipulated penalty under subsection (A), above, for failure to meet any milestone date in Section IV(A) or (B), no other or additional penalty shall be incurred for failure to meet a subsequent milestone date for the same element attributable to the delay for which the initial penalty was incurred, provided, however, that this period of exemption from further penalties shall not exceed the actual number of days by which the initial milestone was missed.

C. Any penalty required to be paid under subsection (A), above, for failure to achieve any milestone date in Section IV(A) or (B) shall be forgiven entirely upon the City's achievement of any subsequent milestone date for the same element.

D. If the City is unable to demonstrate that a project segment identified in Section IV(A) or (B) is On Line and In Operation as of the deadline set forth in that section, the City may apply to EPA for an extension of that deadline for up to six (6) months. EPA shall grant the extension for that project segment if both of the following conditions are met:

(1.) if, during the entire period of the extension, the effluent from the Northeast Plant meets the limits of 30 mg/l for monthly averages of BOD_5 and suspended solids, unless the contributions to the Trust Fund for violation of such effluent limitations are excused pursuant to Section IX(C) of this Amendment; and

(2.) if, during the period of this extension, the City begins a successful On Line and In Operation performance demonstration for such project segment.

The City shall promptly notify EPA that the project segment for which the extension has been sought has achieved the On Line and In Operation milestone.

If the extension is granted under these conditions, and the On Line and In Operation milestone is achieved, then any penalty incurred under subsection (A) above shall be forgiven entirely with respect to such project segment.

E. Effluent Limitations

1. From the date of entry of this Amendment to the termination under Section XI, with respect to the Northeast Plant, the City shall comply with all effluent limitations set forth in subsection E(3), below.

2. Within thirty (30) days after July 1, 1988 and annually thereafter, the City shall submit to EPA a report setting forth the effluent limitations achieved at the Northeast Plant and the construction progress made during the prior year with respect to the elements identified in Sections IV(A), IV(B) and VII. The City may set forth such narrative as it believes appropriate in presenting such operation and construction performance, including a description of the circumstances resulting in failure to achieve any final effluent limitation. Nothing in this paragraph shall alter the City's obligation to submit discharge monitoring reports (DMRs) to EPA, DER and DRBC on a monthly basis.

3. Upon receipt of said report EPA may, upon demand, require the City to make a contribution to the Trust Fund or draw upon any credit available under Section VI(F)(2) in

an amount up to but not to exceed one hundred and twenty thousand dollars ($120,000) for effluent limitation violations during the year covered by the report. EPA shall reduce the amount of the contribution demanded by ten thousand dollars ($10,000) for each month during said year during which the City (a) was in compliance with the final effluent limitations in its NPDES permit for the Northeast Plant for the 30-day average BOD_5 concentration, the 30-day average suspended solids concentration, the 30-day geometric average fecal coliform limitation, the pH limitation and the 30-day average zinc concentration; and the maximum daily concentrations of acrylonitrile, 1,2 dichloroethane, bis(2-chloroethyl ether) and alpha BHC; (b) was excused from any such violation pursuant to the terms of this Amendment; or (c) is not, as a result of EPA's exercise of discretion, required to contribute such amount to the Trust Fund on account of the incomplete status of the facility. EPA's demand for contribution will be accompanied by a statement of reasons. Upon such demand by EPA, the City shall deposit into the Trust Fund such additional contribution. Within the next thirty (30) days the City shall propose and EPA shall promptly approve additional projects EPA deems appropriate for inclusion as Trust Fund projects to the extent necessary to expend any additional contributions required under this paragraph and any interest accumulated to date in the Trust Fund.

F. Designation of Additional Trust Fund Projects

1. The parties have agreed upon a list of Trust Fund projects set forth in Exhibits B and C to Section V. The City may propose additional projects to be added to this list from time to time, subject to EPA's prompt approval.

2. The parties agree that because it may be useful to undertake environmentally beneficial projects prior to an assessment by EPA of the need for additional payments to the Trust Fund, the City may undertake such agreed upon projects prior to a requirement for contributions to the Trust Fund, if EPA approves such projects before the City undertakes them.

3. With respect to any approved amount for any approved Trust Fund project which is in excess of that required to be paid into the Trust Fund for such project, the sum expended on such projects shall be deemed a credit to the City upon which it may draw at its option to fulfill any existing or future obligation to make contributions or to pay penalties to the Trust Fund.

G. Construction Interference with Effluent Quality

The parties recognize that during reconstruction of the project segments and/or the conduct of the tests identified in Sections IV(A), IV(B), and VII, disruption of the treatment process may occur, including disruption caused by reconstruction of the primary tanks. The parties agree that if the City is

able to anticipate such disruptions it shall, prior to the time they occur, submit to EPA a report setting forth (1) the cause of the disruption, (2) its duration, (3) its impact on effluent quality, and (4) the available operational procedures to minimize the effect of the disruption on effluent quality. If the disruption cannot be reasonably anticipated, the City will provide notice of the same factors within 14 days after it has knowledge of the disruption. All relevant factors, including disruption caused by the primary tanks reconstruction, shall be taken into account by EPA in the exercise of its discretion and by the Court in enforcing any violations of the effluent limitations under subsection (E).

VII.

EXISTING PRIMARY TANKS

A. The parties agree that for long-term, consistent compliance with permit limitations it will be desirable to rehabilitate the existing primary tanks at the Northeast Plant by the most efficient and cost effective means. The City hereby commits to carry out a program (the "Rehabilitation Plan" or "Plan") designed to continue the operation of the existing primary tanks at the Northeast Plant for the period of the remaining useful life of the Plant. Prior to the implementation of the Rehabilitation Plan described below, the City shall use best efforts to operate and maintain the primary tanks.

The Rehabilitation Plan for the primary tanks shall include but not necessarily be limited to: concrete repair and reconstruction; replacement of all chains, flights and sprockets; renovation of sludge pumps; modification of electrical system to 3-phase power; and improvement of tank drainage.

B. The City agrees to develop the Rehabilitation Plan including a schedule within 150 days after entry of this Amendment and to submit the plan to EPA and the Pennsylvania Department of Environmental Resources (DER) for approval. The Plan shall be developed with consideration of all relevant factors, including environmental impact, current condition, anticipated costs, financial capacity, possible standard operational changes to mitigate any environmental impact, and the likelihood that it will facilitate long-term, consistent compliance with applicable permit limitations. The parties agree that the general scope of the plan is described in a submission from Greely and Hansen appended as Exhibit D. Upon approval by EPA and DER the City shall carry-out the Rehabilitation Plan, such approval not to be unreasonably withheld.

C. The parties recognize that it is not possible to predict the sequence of rehabilitation activities prior to development of the Rehabilitation Plan. Therefore, it is agreed that, upon development of the Rehabilitation Plan, the parties will identify the action or event which first evidences the City's commitment to physically implement the Rehabilitation Plan (the "Event"); provided, however, that the Event is one which is to occur no later than 90 days after the City has successfully demonstrated that the Final Tanks are On Line and In Operation.

The occurrence of the Event by the City shall be, pursuant to Section XI, a prerequisite to the termination of this Consent Decree, as amended, but shall not be subject to stipulated penalties under the Consent Decree, as amended.

D. The parties recognize and agree that the Northeast Plant is incomplete and, therefore, not capable of consistent compliance with all of the plant's final effluent limitations at design flow. The parties recognize that the Rehabilitation Plan for the existing primary tanks may have a further adverse impact upon the effluent quality attainable by the Northeast Plant. Therefore:

1. EPA, in assessing the requirement for additional contributions for any effluent limitation violations at the Northeast Plant, will take into account the incomplete status of that facility, the actions taken by the City to maintain effluent quality and the impact upon effluent quality of all obligations undertaken by the City pursuant to this Amendment, including without limitation the obligation to carry out the selected rehabilitation alternative for the existing primary tanks.

2. DER and the City agree that continuing construction of the primary tanks after termination may have an impact on the ability of the plant to achieve final effluent limits. If DER and the City agree that this situation obtains notwithstanding that the City is taking all reasonable steps to comply with effluent limitations, these parties agree to negotiate appropriate regulatory recognition of such impacts in a timely manner prior to termination.

3. DRBC and the City agree that continuing construction of the primary tanks after termination may have an impact on the ability of the plant to achieve final effluent limits. If DRBC and the City agree that this situation obtains notwithstanding that the City is taking all reasonable steps to comply with effluent limitations, these parties agree to negotiate appropriate regulatory recognition of such impacts in a timely manner prior to termination.

E. The City hereby commits at least 2.5 million in FY'89 to carry out the Rehabilitation Plan. In subsequent years the City shall commit the amount required as an expenditure by the schedule for the Rehabilitation Plan. Should funds so committed for the Plan be unexpended in any fiscal year, the unexpended balance will be placed into an special account to be used exclusively for the rehabilitation described in the Plan until completion of the Plan. Interest accrued on the funds committed to the Rehabilitation Plan shall be expended to carry-out the Rehabilitation Plan.

F. The parties recognize that changed conditions relating to condition of the primary tanks at the Northeast facility could result in a need to modify or to reorder the Plan, priorities within the Plan, or other provisions of this Amendment related to the functioning of the primary tanks. Should such conditions occur prior to the termination of the Consent Decree, as amended, no modification of the Plan shall be put into effect without the prior consent of EPA and DER.

VIII.

COORDINATION, FACILITATION AND MONITORING

The parties agree that improvement of coordination among the parties and assistance by the regulatory agencies in obtaining necessary permits will facilitate the achievement of the goals of the Consent Decree and this Amendment. Therefore, the parties agree to the following:

A. The parties agree to use their best efforts as appropriate to facilitate the obtaining of necessary permits.

B. Periodic Reports

1. The City will prepare Critical Path Method ("CPM") analysis including network diagrams for the construction elements identified in Sections IV(A) and (B), and submit such analyses to EPA and DER. The information submitted by the City shall contain the level of detail necessary to facilitate management of the entire construction program, as well as the individual phases of the program. It will identify all steps which remain to be taken to complete the task, the order in which the steps must be completed,

the interrelationship of steps, and an identification of those steps which control task completion. The CPM's shall be updated every month and submitted to EPA and DER on the last day of each month for the preceding month as long as construction continues.

2. By the time that each of the construction elements identified in Sections IV(A) and (B) is 50% complete, the City will provide to EPA and DER a report identifying a detailed plan for the staffing, training, startup and testing of each of these construction elements. These reports will outline assumptions and discuss the interrelationship of various construction elements. They shall provide a logical plan for phasing in the operation of each of the construction elements, and shall include an implementation schedule for the staffing, training, start-up and testing of each of the construction elements. The City shall provide semi-annual updates of the progress made toward achieving the plan identified in the initial report.

IX.

EXTENSION OF CONSTRUCTION MILESTONES AND RELIEF FROM EFFLUENT VIOLATIONS

A. If any milestone in Sections IV(A), IV(B) or VII of this Amendment has not been achieved, the City shall submit to EPA a written report no later than 30 days following the date for the achievement of the milestone. The report shall include:

1. a complete description of any factors which explain the failure including all necessary documentation;
2. a description of the actions taken or proposed to be taken to comply with the missed milestone;
3. the date by which the milestone will be achieved;
4. a description of any future milestone which may be affected by the present failure;
5. the date by which any affected future milestone(s) will be achieved; and

6. the actions that could be taken to prevent violations of future milestones.

B. No later than thirty (30) days after any missed milestone in Sections IV(A), IV(B) or VII of this Amendment, the City shall apply in writing to EPA for any extension which the City feels is justified under the terms of this Amendment. The application for an extension shall describe in detail the length of time of the requested extension, the precise circumstances creating the delay and justifying the request, the measures taken and to be taken by the City to minimize the effect of the delay, and a timetable by which any such future measures will be implemented. EPA shall promptly respond to extension requests.

C. The City shall be excused as to any violation of effluent limitations in Section VI(E), or any delay for which an extension of any milestone in Sections IV(A), IV(B) or VII of this Amendment is sought, if the City and EPA agree that such violation of effluent limitations or delay in a milestone has been caused by circumstances beyond the control of the City. In that event, payment to the Trust Fund shall not be due for said violation or delay. Where an extension is agreed to for a milestone set forth in Sections IV(A), IV(B) or VII, the time for achievement of such date shall be extended for a period not to

exceed the total actual delay in achieving such requirement that is caused by the circumstances beyond the control of the City. Circumstances beyond the control of the City include, but are not limited to, such events as acts of God, strikes by City or contractor employees, and failure of any regulatory authority to take action for which the City has timely, accurately and completely applied and which the City can prove is necessary for it to meet its obligations under this Amendment. Circumstances beyond the control of the City do not include increased costs or expenses.

D. In the event that the City and EPA do not agree on whether a violation of effluent limitations or a delay in a milestone has been caused by circumstances beyond the control of the City, either party may submit the matter to this Court for resolution.

E. The City shall at all times bear the burden of proving that any delay or effluent violation was caused by circumstances beyond the control of the City.

X.

DIGESTER STUDY

The parties have agreed that the City shall undertake a study to determine whether additional digester capacity is required at the Northeast Plant. This study shall be conducted pursuant to the methodology proposed by the City and approved by EPA and DER. Upon completion of the study, the parties will review it and discuss whether such additional capacity

is necessary. If additional digestion capacity is determined to be necessary, the parties will agree on a schedule for construction/rehabilitation with which the City will comply. If the need for additional digestion capacity is confirmed, the digester modifications are expected to be available for 75% federal grant funding based on the availability of federal grant funds since it would be a segment of the overall Northeast Plant grant project. The construction/rehabilitation of the digesters, if necessary, shall not be subject to stipulated penalties under this Amendment.

XI.

TERMINATION

A. Once the City demonstrates that the Final Tanks at the Northeast Plant are On Line and In Operation, the NPDES permit will regulate compliance with effluent parameters at the Northeast Plant except to the extent provided in VII(D)(2). At that time, Section VI(E) of this Amendment will terminate.

B. This Amendment shall terminate when the City has (1) demonstrated On Line and In Operation performance of the project segments identified in Section IV(A) and (B); (2) accomplished the action or certified to EPA the occurrence of the event to be identified pursuant to Section VII(C); and (3) certified to EPA that construction of additional digester capacity, if determined necessary, has commenced.

EXHIBIT A

On-Line and In Operation Definitions

The following criteria will be used to determine compliance with the On-Line and In Operation milestones identified in Section IV (A) and (B) of this Amendment. The elements will be considered On-Line and In Operation when the City demonstrates the following:

1) Final Tank Modifications

a) The achievement of construction completion and

b) the proper operation of the modified final tanks up to the design hydraulic limits for a period of 90 consecutive days, while maintaining compliance with the monthly average effluent limitations for suspended solids and BOD_5. During this period the modified final tanks shall treat their proportionate share of wastewater; with any 6 of the 8 tanks in use, and any 2 of the 3 return sludge pumping systems being available for operation throughout this period. If primary tank rehabilitation under the Rehabilitation Plan has begun at the time of the Final Tank On-Line and In-Operation test, the requirement for meeting the monthly average effluent limitations for suspended solids and BOD^5 shall not be required as part of a successful On-Line and In-Operation Test.

2) Sludge Composting

a) The achievement of the construction completion milestone; and

b) the proper operation of the composting facilities for a period of 90 consecutive days during which the following proportion of related equipment will be available for operation:

i) any 30 out of 40 blowers, and

ii) any 4 of 6 trommels, and

iii) any 2 of 3 mixers.

3) Sludge Dewatering

a) The achievement of construction completion and

b) the ability of the new dewatering facilities to process all of the sludge produced by the City's Northeast, Southeast and Southwest Treatment Plants for a period of 90 consecutive days. During this period the facility shall produce a sludge cake containing at least 17% solids and maintain a solids capture of at least 90%. Any 7 of the 10 centrifuges must be available for operation throughout the test period.

4) Sludge Transport System

a) The achievement of construction completion; and

b) the proper operation of the sludge transport system for a period of 90 consecutive days during which all of the sludge produced by the Northeast Plant shall be transported to the Southwest Plant for dewatering.

ATTACHMENT A

EXHIBIT "C"

Hancock Street from Thompson Street to Oxford Street

Sewer reconstruction and water main renewals are proposed for two blocks. In both blocks the exiting 2'-3" X 1'-6" brick sewer constructed in 1892 and 1895 respectively were found to be in poor condition and recommended for reconstruction. These existing sewers will be replaced by lengths of 615' of new 18" dia. and 250' of 21" dia. reinforced concrete sewer pipe. The existing 6 inch dia. cast iron water mains originally installed in 1845 and 1853 respectively within these streets will also be renewed due to deteriorating condition and interference with sewer reconstruction. A total length of 825 feet of new 8" dia. ductile iron water main will replace these existing water line. New water services for each property will be included in the contract. It is estimated that 15,000 gallons per day of leakage and dry weather inflow will be eliminated as a result of this project. The added benefit of water main replacement will be elimination of lead service lines to the homes in these blocks. Estimated cost for this sewer and water main renewal project is $240,000.

IN THE UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF PENNSYLVANIA

CITY OF PHILADELPHIA,	:	
Plaintiff,	:	
v.	:	CIVIL ACTION NOS. 78-878, 78-1732, 78-1733, 78-1851
EPA, et al.,	:	
Defendants	:	

REQUEST TO FILE CERTAIN EXHIBITS UNDER SEAL

The United States requests the filing under seal of the attached copies of Exhibits B, C and D to the Amendment to the 1979 Consent Decree lodged with the Clerk of Court on this date. Exhibits B, C and D, as attached to the Amendment as public records, contain descriptions of projects to be undertaken using Trust Fund monies. The copies of these Exhibits to be filed under seal include those descriptions, and in addition the estimated costs of each project. The costs are filed under seal to avoid influencing the bidding on the Trust Fund projects.

Counsel for the other parties to this Amendment have consented to this request.

Respectfully submitted,

EDWARD S. G. DENNIS, JR.
United States Attorney

JAMES G. SHEEHAN
Assistant United States Attorney
Chief, Civil Division

CATHERINE VOTAW
Assistant United States Attorney

EXHIBIT B

1. Northeast Drainage District Sewer Construction and Water Main Renewal

The environmental benefit of this undertaking is to eliminate the threat to groundwater and surface activities from sewer and water main failure. In addition, this work should reduce infiltration to the Northeast Plant in excess of 90,000 gallons per day.

Location	Estimated Cost
Clearfield Street, from 17th to Bancroft Streets, and 17th Street, from Indiana Street to Clearfield Street	$ 678,200
Ontario Street, from Broad Street to 16th Street, and Sydenham Street, from Westmoreland Street to Ontario Street	333,800
Memphis Street, from Huntingdon Street to Lehigh Avenue	231,800
Schiller Street, from 7th Street to 8th Street	107,300

2. Odor Characterization Study

The City will hire an outside consultant to develop methods to characterize and measure the intensity of odors at the Northeast Plant. The study will entail the development of sample collection techniques and the analysis of these samples using advanced laboratory techniques. This effort will be coupled with the establishment of an odor panel made up of persons trained in the field. This panel will analyze and determine the chemical content of the odors and this determination will lead to corrective action. It will also provide an opportunity for the City's industrial waste

inspectors to track the point source discharges which impact treatment processes. These techniques should be beneficial industry-wide. The development state of this project (Phase I) which the City agrees hereunder to execute is estimated to cost one hundred thousand dollars ($100,000).

3. CSO Project

The Combined Sewer Overflow (CSO) Project currently obligated in the Environmental Trust Fund entails the installation of 63 monitoring stations located in the City s Upper Delaware Lower Level Interceptor System of the Northeast Plant. The project consists of instrumentation in regulating chambers, flow level sensors in the interceptor and rain gauges. Signals from these field instruments are transmitted to an existing Process control computer located at the City's Sewer Maintenance Headquarters.

During 1985 and 1986 the process control computer was upgraded by updating its hardware, software and communication systems.

To further enhance the effectiveness of the CSO Project, the City will improve the current data acquisition system and expand the network of field instrumentation so that the entire network would be compatible. This compatibility is necessary to further develop operating strategies to control the discharge of stormwater runoff.

This new project would consist of the following:

- Upgrade the three existing monitors and control vaults at Magee Street, Dark Run Lane and Ash Street.
- Install solar cells to energize the field monitoring stations.

- Upgrade the instrumentation at 8 remote flow level stations and 13 rain gauges.

This new phase of the CSO Project is estimated to cost one hundred and sixty thousand dollars ($160,000).

4. Illegal Dumping Enforcement Program

The City will coordinate an enforcement program against hydrant abuse and illegal dumping at inlets of wastes by commercial and industrial businesses. The program anticipates the dedication of District Attorney and City Solicitor resources and court days, as well as stepped up enforcement by City inspectors authorized to enforce code violations and enhancement of that effort by delegation to Water Department employees of that enforcement authority. The estimated cost of this program is fifty thousand dollars ($50,000).

5. Seasonal Disinfection Study

A seasonal disinfection study in cooperation with the Commonwealth of Pennsylvania Department of Environmental Resources and the Delaware River Basin Commission which will be carried out over a 24 month period to determine if water quality in the Delaware Estuary will be enhanced by practicing chlorination on a seasonal basis. The estimated cost is one hundred and forty thousand dollars ($140,000).

6. Cobbs Creek Infiltration-Inflow Abatement

An interceptor chamber will be reconstructed which will eliminate flow from Cobbs Creek into an interceptor. The reconstruction will reduce dry weather flow by approximately four and one-half million gallons per day to the Southwest Water Pollution Control Plant. This problem arises because the stream bed has risen to a point where it is higher than the interceptor chamber and thus clean water from the stream floods the interceptor. The flow from the stream will be eliminated and the capacity of the plant to treat necessary flows will be enhanced by one million gallons per day. The estimated cost of this Project is four hundred and fifty thousand dollars ($450,000).

EXHIBIT C

The City of Philadelphia will undertake to eliminate the threat to groundwater and surface activities from sewer and water main failure and eliminate an estimated 15,000 gallons per day of leakage and dry weather inflow to the Northeast Plant by completing sewer reconstruction and water main renewal at Hancock Street, from Thompson Street to Oxford Street at an estimated cost of $240,000.

EXHIBIT B

1. Northeast Drainage District Sewer Construction and Water Main Renewal

The environmental benefit of this undertaking is to eliminate the threat to groundwater and surface activities from sewer and water main failure. In addition, this work should reduce infiltration to the Northeast Plant in excess of 90,000 gallons per day.

Location

Clearfield Street, from 17th to Bancroft Streets, and 17th Street, from Indiana Street to Clearfield Street

Ontario Street, from Broad Street to 16th Street, and Sydenham Street, from Westmoreland Street to Ontario Street

Memphis Street, from Huntingdon Street to Lehigh Avenue

Schiller Street, from 7th Street to 8th Street

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The City will hire an outside consultant to develop methods to characterize and measure the intensity of odors at the Northeast Plant. The study will entail the development of sample collection techniques and the analysis of these samples using advanced laboratory techniques. This effort will be coupled with the establishment of an odor panel made up of persons trained in the field. This panel will analyze and determine the chemical content of the odors and this determination will lead to corrective action. It will also provide an opportunity for the City's industrial waste

inspectors to track the point source discharges which impact treatment processes. These techniques should be beneficial industry-wide.

3. CSO Project

The Combined Sewer Overflow (CSO) Project currently obligated in the Environmental Trust Fund entails the installation of 63 monitoring stations located in the City s Upper Delaware Lower Level Interceptor System of the Northeast Plant. The project consists of instrumentation in regulating chambers, flow level sensors in the interceptor and rain gauges. Signals from these field instruments are transmitted to an existing Process control computer located at the City's Sewer Maintenance Headquarters.

During 1985 and 1986 the process control computer was upgraded by updating its hardware, software and communication systems.

To further enhance the effectiveness of the CSO Project, the City will improve the current data acquisition system and expand the network of field instrumentation so that the entire network would be compatible. This compatibility is necessary to further develop operating strategies to control the discharge of stormwater runoff.

This new project would consist of the following:

- Upgrade the three existing monitors and control vaults at Magee Street, Dark Run Lane and Ash Street.
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A seasonal disinfection study in cooperation with the Commonwealth of Pennsylvania Department of Environmental Resources and the Delaware River Basin Commission which will be carried out over a 24 month period to determine if water quality in the Delaware Estuary will be enhanced by practicing chlorination on a seasonal basis.

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EXHIBIT C

The City of Philadelphia will undertake to eliminate the threat to groundwater and surface activities from sewer and water main failure and eliminate an estimated 15,000 gallons per day of leakage and dry weather inflow to the Northeast Plant by completing sewer reconstruction and water main renewal at Hancock Street, from Thompson Street to Oxford Street.

CITY OF PHILADELPHIA
WATER DEPARTMENT
NORTHEAST WATER POLLUTION CONTROL PLANT

Old Existing Primary Sedimentation Tanks
Extended Life Program

Greeley and Hansen
July 31, 1987

1. GENERAL

An Extended Life Program for the old existing primary sedimentation tanks at the Northeast Water Pollution Control Plant shall include concrete repairs and mechanical and electrical equipment replacement as part of an overall Rehabilitation Plan. The Extended Life Program is designed to increase the service life of primary tank structures and to provide increased mechanical and electrical reliability. This program is recognized as a limited undertaking designed within fiscal restraints; a more extensive rehabilitation including hydraulic modifications, scum removal, possible odor control measures and other improvements is also recommended should funding be made available.

The Old Existing Primary Sedimentation Tanks have been in continuous service for over 35 years. The old existing tanks consist of four rectangular concrete basins arranged "side by side" with common wall construction. Flow enters each tank through six inlet ports and exits over rectangular effluent weirs. Submerged baffles at the inlet distribute flow to provide effective usage of the tankage for settling operations.

Settled primary sludge is collected within each tank by seven chain and flight type longitudinal collectors and two chain and flight type cross collectors and is conveyed to a sump at the influent end of the tank. Collected sludge is removed from the sump by a submersible type sludge pump. Scum is skimmed from the tank surface by the longitudinal collectors and rotating scum trough assemblies convey scum to the Scum Disposal Facilities.

2. EXISTING CONDITIONS

Field investigations were conducted to assess the present condition of equipment and structures as required to determine improvements necessary to provide extended life to the present operating system. Observations made during the field inspections are summarized below.

In general, the equipment has received regular maintenance; however, signs of deterioration are evident. Significant wear is visible on the chains, sprockets, and gears. Return flight rails appeared to be in fair condition; however, some cross collector return rails are bent and support brackets were pulling away from the concrete in some places. Baffles and baffle supports at the inlet end of the tanks are in fair condition.

Sludge pumping equipment is adequate, however, there is no provision for standby units. The pumps are near the end of their useful life.

Handrails in numerous locations are bent or have pulled away from the concrete support or both. In addition, the extent of the handrails and the arrangement of the existing handrails are inadequate.

Grating over openings or around gate operators are in generally poor condition.

Bottom rails embedded in the base slabs are worn out.

Existing electrical power is provided through two-phase service. Most other plant equipment has been converted to more common three-phase power. Insulation on the power cables is showing signs of deterioration.

Old existing yard drainage for the Primary Sedimentation Tanks experience frequent blockages. Blockages usually occur at locations which are not easily accessible.

The structural condition of the tanks appears sound although spalls, cracks, delamination, deteriorated expansion joints and other minor structural problems were discovered during field investigations.

Some significant cracks and concrete delamination are located in the walls and slabs. Columns within the tanks supporting the collector system appear to be sound; although some column tops are deteriorated. Influent channel walkways in Tanks 3 and 4 are severely deteriorated. Influent channel walkways for Tanks 1 and 2 have cracks and spalling in the support beams and slabs. Portions of the dividing walkways between Tanks 2 and 3, and between Tanks 3 and 4 are severely deteriorated.

Significant cracks exist in most of the parapet walls which extend above the tank walls around the periphery of the tanks. Parapets are not structurally tied into the wall and are therefore free to move under exerted soil pressures. Therefore, in many cases the parapets had shifted out of plane.

3. EXTENDED LIFE PROGRAM

Under the Extended Life Program all chains, flights, gears, drives, shafts and sprockets on the longitudinal and cross collectors would be replaced with new equipment. New bottom and return rails would be installed. Existing sludge pumping equipment would be retired and new equipment provided.

For improvements in yard drainage new manholes would be provided at junctions of laterals and trunk lines and at other locations identified as frequent blockage points. Other yard drainage work would be provided as necessary. Improved drainage will decrease the "turnaround" time when tankage is out for maintenance or inspection, thereby improving operating service time.

Electrical service work would include replacement of the existing two-phase power with a three-phase power system. New gear and wiring would be provided.

Handrails and grating would be completely replaced to insure safe operating conditions around the tanks.

Spalled and delaminated concrete in the slabs and tank walls would be removed by chipping to sound substrates and rebuilding the concrete to original lines and surfaces. Column sections showing spalling conditions or loss of concrete would be removed and rebuilt to original form.

Portions of walkways along the influent and effluent channels and at the top of dividing walls would be replaced.

Parapets would be removed and the surrounding grades would be recontoured to eliminate the need of the parapets where practicable. Where needed, new parapets would be constructed. Dowels would be provided to interconnect the walk with new parapets.

Expansion joints would be rehabilitated as required throughout to maintain watertightness of the tanks.

4. ESTIMATED CONSTRUCTION COSTS

Preliminary construction costs to implement the Extended Life Program are estimated at a cost of approximately $5,000,000.

TABLE 1

CITY OF PHILADELPHIA
WATER DEPARTMENT
NORTHEAST WATER POLLUTION CONTROL PLANT

Old Existing Primary Sedimentation Tanks
Extended Life Program

Preliminary Construction Cost Estimate

Greeley and Hansen
July 31, 1987

Item	Unit	Quantity	Unit Cost	Total Cost
Demolition	Job	LS	$ 350,000	$ 350,000
Excavation	CY	3,000	12	36,000
Backfill	CY	300	10	3,000
Concrete	CY	310	480	148,800
Reinforcing Steel	Ton	30	1,500	45,000
Concrete Rebuilding	LS	LS	610,000	610,000
Expansion Joint Repair	LF	4,200	25	105,000
Rail Replacement	LF	14,200	30	426,000
Grating	SF	600	25	15,000
Handrail	LF	3,600	50	180,000
Baffles	LS	LS	35,000	35,000
Sludge Collection Equipment	LS	LS	1,800,000	1,800,000
Sludge Pumping Equipment	LS	LS	150,000	150,000
Manholes	EA	5	2,000	10,000
Instrumentation	LS	LS	30,000	30,000
Electrical Work	LS	LS	450,000	450,000
Seed/Topsoil	LS	LS	35,000	35,000
Unidentified Items	LS	LS		661,200
TOTAL				$5,090,000

Entered this ___ day of 1985.

J. William Ditter, Jr., J.
United States District
Judge

Approved for entry without further notice.

THE CITY OF PHILADELPHIA

By: _____
W. Wilson Goode
Mayor

By: _____
James S. White
Managing Director

By: _____
Carlo R. Gambetta
Finance Director

By: _____
William J. Marrazzo
Commissioner
Water Department

UNITED STATES OF AMERICA

By: _____
Roger J. Marzulla
Acting Assistant Attorney
General
Land and Natural Resources
Division
United States Department
of Justice

Edward S. G. Dennis, Jr.
United States Attorney

By: _____
James G. Sheehan
Assistant United States Atto
Chief, Civil Division

By: _____
Thomas L. Adams, Jr.
Assistant Administrator for
Enforcement & Compliance
Monitoring
United States Environmental
Protection Agency
Washington, D.C. 20460

By: _____
Hansel B. Minyard
City Solicitor

By: _____
Pamela Foa
Divisional Deputy City
Solicitor

By: _____
Henry L. Diamond
Richard S. Davis
Beveridge & Diamond
Special Counsel

THE COMMONWEALTH OF PENNSYLVANIA

By: _____
Markum McClellan
Deputy Secretary
Department of Environmental
Resources

By: _____
Louise Thompson
Counsel for Department of
Environmental Resources

By: _____
James M. Seif
Regional Administrator
United States Environmental
Protection Agency
Region III

By: _____
Bruce M. Diamond
Regional Counsel
United States Environmental
Protection Agency
Region III

By: _____
Adam M. Kushner
Assistant Regional Counsel
United States Environmental
Protection Agency
Region III

By: _____
Catherine Votaw
Assistant United States
Attorney

By: _____
Dianne Kelly
Trial Attorney
Land and Natural Resources
United States Department
of Justice

PLAINTIFF-INTERVENORS:

Maryland

By: _____
J. Joseph Curran, Jr.
Attorney General
Thomas A. Deming
Assistant Attorney General

Delaware River Basin
Commission

By: _____
David Goldberg, Esq.

Sierra Club, et al.

By: _____
Jerome Balter
Attorney for Sierra Club,
et al.

CITY OF PHILADELPHIA
WATER DEPARTMENT
NORTHEAST WATER POLLUTION CONTROL PLANT

Old Existing Primary Sedimentation Tanks
Extended Life Program

Greeley and Hansen
July 31, 1987

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Expansion joints would be rehabilitated as required throughout to maintain watertightness of the tanks.

4. ESTIMATED CONSTRUCTION COSTS

Preliminary construction costs to implement the Extended Life Program are estimated at a cost of $5,090,000. A breakdown of costs is presented in Table 1.

TABLE 1

CITY OF PHILADELPHIA
WATER DEPARTMENT
NORTHEAST WATER POLLUTION CONTROL PLANT

Old Existing Primary Sedimentation Tanks
Extended Life Program

Preliminary Construction Cost Estimate

Greeley and Hansen
July 31, 1987

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Instrumentation	LS	LS	30,000	30,000
Electrical Work	LS	LS	450,000	450,000
Seed/Topsoil	LS	LS	35,000	35,000
Unidentified Items	LS	LS		661,200
TOTAL				$5,090,000

CERTIFICATE OF SERVCIE

It is hereby certified that a copy of the foregoing Request to File Certain Exhibits Under Seal was sent by United States mail, postage prepaid, this day of February, 1988, to the following:

Pamela Foa, Esquire
Divisional Deputy City Solicitor
City of Phila. Water Department
ARA Tower, 5th Floor
1101 Market Street
Philadelphia, PA 19107

Henry Diamond, Esquire
Beveridge & Diamond
1333 New Hampshire Avenue
Washington, DC 20036

Adam Kushner, Esquire
U.S. Environmental
Protection Agency
841 Chestnut Building
Philadelphia, PA 19106

Diane Kelly, Esquire
Environmental Enforcement Section
U.S. Dept. of Justice
Room 7320
Washington, DC 20530

Jerome Balter, Esqurie
1315 Walnut Street
Suite 1632
Philadelphia, PA 19107

Louise Thompson, Esquire
1314 Chestnut Street
12th Floor
Philadelphia, PA 19107

David Goldberg, Esquire
Warren Goldberg & Berman
P.O. Box 645
Princeton, NJ 08540

CATHERINE VOTAW
Assistant United States Attorney

ER–BWQ–15.2: Rev. 8/87

DRAFT

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF WATER QUALITY MANAGEMENT

JUL. 2 2 1992

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM SEWAGE PERMIT NO. PA 0026689

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 et seq. (the "Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 et seq.,

City of Philadelphia Water Department

is hereby authorized to discharge from the Northeast Water Pollution Control Plant (Point Source 001) and 59 overflow points (Point Sources 002-060) located in the City of Philadelphia, Philadelphia County.

to the receiving waters named Delaware River Zone 3 (Point Sources 001-022 and 058); Pennypack Creek (Point Sources 023-027); Tacony Creek (Point Sources 028-041 and 059-060); and Frankford Creek (Point Sources 042-057).

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B, and C hereof.

This permit and the authorization to discharge shall expire at midnight _____.

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the standard or special conditions, and the terms and conditions of this permit, the terms and conditions shall apply.

2. Failure to comply with any of the terms or conditions of this permit is grounds for enforcement action; for permit termination, revocation and reissuance or modification; or for denial of a permit renewal application.

3. It is required by law that this permit, before becoming operative, shall be recorded in the Office of the Recorder of Deeds for the county wherein the outlet of said sewer system is located.

4. Application for renewal of this permit, or notification of intent to cease discharging by the expiration date, must be submitted to the Department at least 180 days prior to the above expiration date (unless permission has been granted by the Department for submission at a later date), using the appropriate NPDES Permit Application Form. In the event that a timely and complete application for renewal has been submitted and the Department is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit will be automatically continued and will remain fully effective and enforceable pending the grant or denial of the application for permit renewal.

5. This permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

PERMIT ISSUED BY _____

DATE _____ TITLE Joseph A. Feola

DRAFT

PART A

JUL. 22 1992

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001; LOCATED AT LATITUDE 39°58'50.6", LONGITUDE 75°04'34.9"

A. The Permittee is authorized to discharge during the period from issuance through expiration.
B. The average monthly flow of effluent discharged from the wastewater treatment facility shall not exceed 210 million gallons per day.
C. The quality of effluent shall be limited at all times as specified in Footnote (3) and as follows:

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)		CONCENTRATIONS (mg/l)				INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY				
FLOW (a)								Continuous	Recorded	
BOD_5 (b)	42,400	63,600		30	45		60	Daily	24 HC	
BOD_5 % Removal (f)	DRBC Zone 3 Requirement of 86%							Daily	24 HC	
SUSPENDED SOLIDS	52,540	78,810		30	45		60	Daily	24 HC	
$CBOD_{20}$ (c)	72,500							2/Week	24 HC	
FECAL COLIFORM (5-1 to 9-30)			See Footnote 2					Daily	Grab	
FECAL COLIFORM (10-1 to 4-30)			Same Limits as in Footnote 2					Daily	Grab	
pH	Within Limits of 6 to 9 Standard Units at all times							Daily	Grab	
NH_3-N				Monitor Only	Monitor Only			1/Week	24 HC	
TKN				Monitor Only	Monitor Only			1/Week	24 HC	

Continued on Page 2a

DRAFT

JUL. 2 2 1992

Continued From Page 2

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS			
	MASS UNITS (lbs/day)		CONCENTRATIONS (mg/l)				INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY				
NO_3-N				Monitor Only	Monitor Only			1/Week	24 HC	
NO_2-N				Monitor Only	Monitor Only			1/Week	24 HC	
ALUMINUM, TOTAL (d)				Monitor Only				1/Month	24 HC	
CHROMIUM, TOTAL (d)				Monitor Only				1/Month	24 HC	
CHROMIUM, HEXAVALENT (d)				Monitor Only				1/Month	Grab	
IRON, TOTAL (d)				Monitor Only				1/Month	24 HC	
IRON, DISSOLVED (d)				Monitor Only				1/Month	24 HC	
MANGANESE (d)				Monitor Only				1/Month	24 HC	
SILVER (d)				Monitor Only				1/Month	24 HC	
ZINC, (d)				Monitor Only				1/Month	24 HC	

Continued on Page 2b

Continued From Page 2a

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS			
	MASS UNITS (lbs/day)		CONCENTRATIONS (mg/l)							
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
CYANIDE, FREE (d)				MONITOR ONLY				1/Month	24 HC	
PHENOLS, TOTAL (d)				MONITOR ONLY				1/Month	24 HC	
2,4 DIMETHYLPHENOL (d)				MONITOR ONLY				1/Month	24 HC	
4,6 DINITRO-O-CRESOL (d)				MONITOR ONLY				1/Month	24 HC	
CHLOROFORM (d)				MONITOR ONLY				1/Month	Grab	
1,2 DICHLOROETHANE (d)				MONITOR ONLY				1/Month	Grab	
TRICHLOROETHYLENE (d)				MONITOR ONLY				1/Month	Grab	
BIS (2-CHLOROETHYL) ETHER (d)				MONITOR ONLY				1/Month	24 HC	
TOTAL RESIUDAL CHLORINE				MONITOR ONLY				Daily	Grab	

FOOTNOTES: 1. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfall 001 at the Pier Effluent Sampling Building.

(a) See Paragraph O, Other Requirements (Page 14m of 14)
(b) See Paragraph P, Other Requirements (Page 14m of 14)
(c) $CBOD_{20}$ - 20 Day Carbonaceous Biochemical Oxygen Demand Test with Nitrogenous Oxygen Demand Inhibited.
(d) See Paragraph H, Other Requirements (Page 14a of 14)
(e) See Paragraph G, Other Requirements (Page 14a of 14)

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001; LOCATED AT LATITUDE 39°58'50.6", LONGITUDE 75°04'34.9"

A. During the period beginning at issuance and lasting through expiration, the Permittee is authorized to discharge.

B. Based on production data and anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply:

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)		TUc ****					
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	MAXIMUM DAILY	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
WHOLE EFFLUENT TOXICITY - CERIODAPHNIA DUBIA *&**					MONITOR ONLY	QUARTERLY	24 H.C.	
WHOLE EFFLUENT TOXICITY - FATHEAD MINNOW * & ***					MONITOR ONLY	QUARTERLY	24 H.C.	

FOOTNOTES: 1. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfall 001 at the Pier Effluent Sampling Building.

* See Paragraph Q, Other Requirements (Page 14m of 14)

** Toxicity monitoirng based on static renewal chronic Ceriodaphnia dubia test reported as a maximum daily result.

*** Toxicity monitoring based on static renewal chronic Fathead minnow test reported as a maximum daily result.

**** TUc: Chronic Toxicity Units $TUc = \frac{100}{NOEC}$

nitoring requirements, and other standard and
relate to the discharge(s) of pollutants authorized
are contained in Water Quality Management Permit(s)

208 issued on August 4, 1972; August 24, 1961 and

rms and conditions of this permit, unless
ise herein.

Monitoring Report is to be sent to the following

ware River Basin Commission
Box 7360
enton, New Jersey 08628

forcement Branch (3WM51)
Environmental Protection Agency
stnut Building
lelphia, PA 19107

the Discharge Monitoring Report, the term "average
hest average weekly value observed during the

partment, the sewage treatment plant is not so
change in the character of the waste or
age treatment plant, or changed use or condition
, or otherwise, that the effluent ceases to be
eatment plant creates a public nuisance, then
t the right herein granted to discharge such
e null and void unless within the time
e permittee shall adopt such remedial
effluent which, in the opinion of the
ory for discharge into the receiving body of

, area ways, roofs, foundation drains or other
e sanitary sewers associated with the herein

pecifically made contingent upon the permittee
rights by easement or otherwise, providing
on, operation, maintenance and replacement of
es associated with the herein approved
ivate property, with full rights of

least 86% as a monthly
laware River Basin
ercent removal shall be
the influent and
acteristics of the raw
flows. If equivalent
ts, the percent removal
5 measurements.

rformed using the
36, Guidelines
llutants, or any approved

(AA, Flame)
(AA, Flame)
(AA, Extraction)
(AA, Direct)
(AA, Direct)
Attached)
(4AAP, Manual)
(AA, Flame)
(AA, Furnace)
(AA, Flame)
(GC/MS ISOTOPE)
(GC/MS ISOTOPE)
(GC/Hal.)
(GC/MS)
(GC/Hal.)

ard to implementation of the

trial pretreatment program in
and the General Pretreatment
ogram shall also be
pproved and/or modified POTW
e permittee.

ges, and obtain approval of all
d pretreatment program in

its pretreatment program shall,
s listed below. Where the
ingent or more frequent
approved program shall apply.

OTHER REQUIREMENTS (Continued)

(a) The permittee shall provide written notice of applicable pretreatment requirements to all industrial users. For significant industrial users (SIUs) such written notice shall be through individual discharge permits or other equivalent control mechanism in accordance with 40 C.F.R. 403.8(f). All SIU control mechanisms shall be in place within 6 months of program approval and shall not be issued for a period which exceeds 5 years. SIU control mechanisms shall be reissued within 3 months of expiration, and administrative extensions shall not be granted without written consent from the Approval Authority.

(b) Each SIU shall be sampled by the permittee at least once per year. Such sampling shall include all regulated parameters.

(c) Each SIU shall be inspected by the permittee at least once per year. Such inspection shall cover all areas which could result in wastewater discharge to the sewer including manufacturing areas, chemical storage areas, pretreatment facilities, spill prevention and control procedures, hazardous waste generation, and industrial self-monitoring procedures and records.

(d) The permittee shall implement the industrial reporting requirements of 40 C.F.R. 403.12.

(e) The permittee shall develop and obtain Approval Authority approval of a written enforcement response plan (ERP) within 6 months of permit issuance. The ERP shall indicate how instances of violation will be investigated, what enforcement options are available to the POTW, contain a listing of potential industrial violations, and state the type of action and timeframe for the permittee's enforcement for each violation. Where approval of the ERP has been previously granted, the permittee shall reevaluate its ERP and submit the results of the reevaluation and a revised ERP within 6 months of permit issuance.

(f) The permittee shall take timely and appropriate enforcement in accordance with its approved ERP for all instances of industrial violations.

OTHER REQUIREMENTS (Continued)

(g) The permittee shall submit, to the Approval Authority, a reevaluation of its local limits based on a headworks analysis of its treatment plant within 1 year of permit issuance. At a minimum, the headworks analysis shall include arsenic, cadmium, chromium, copper, cyanide (T) lead, mercury, nickel, silver, zinc, any parameter limited by this permit or sludge disposal requirements, and any other pollutant which the permittee or approval authority believes may be discharged by its industries in amounts which may cause pass-through or interference. The list of pollutants to be evaluated shall be submitted within 3 months of permit issuance.

(h) The permittee shall conduct monitoring at its treatment plant based on its permitted flows, as follows:

i) > 20 MGD - monthly influent, effluent and sludge analysis for all local limit parameters, semi-annual priority pollutant scan for influent and sludge.

ii) > 5-20 MGD - monthly influent, effluent and sludge analysis for all local limit parameters, annual priority pollutant scan for influent and sludge.

iii) > 1-5 MGD - quarterly influent, effluent and sludge analysis for all local limit parameters, annual priority pollutant scan for influent and sludge.

iv) < 1 MGD - annual influent, effluent and sludge analysis for all local limit parameters, priority pollutant scan for influent and sludge within 1 year.

(i) The permittee shall ensure that adequate resources are available (equipment and personnel) to fully implement the pretreatment program.

(4) EPA and DER retain the right to require the permittee to institute changes to its pretreatment program if:

(a) The program is not implemented in a way satisfying the requirements of 40 C.F.R. 403.

(b) Problems such as interference, pass-through or sludge contamination develop or continue.

(c) Federal, State, or local requirements change.

PART C

OTHER REQUIREMENTS (Continued)

(5) By March 31 of each year, the permittee shall submit to EPA and DER an annual report that describes the permittee's pretreatment activities for the previous calendar year. The annual report shall include pretreatment activities in all municipalities from which wastewater is received at the permittee's treatment plant. The submission to DER shall be incorporated into the permittee's annual Municipal Wasteload Management report required by DER's Chapter 94 Rules and Regulations. The annual report shall include the following:

(a) Control Mechanism Issuance - a summary of SIU control mechanism issuance including a list of issuance and expiration dates of each SIU.

(b) Sampling and Inspection - a summary of the number and type of inspections and samplings of SIUs by the permittee, including a list of all SIUs either not sampled or not inspected.

(c) Industrial User Compliance and POTW Enforcement - a summary of the number and type of violations of pretreatment regulations and the actions taken by the permittee to obtain compliance. For each SIU, the report shall say whether the user was in significant noncompliance under 40 C.F.R. 403.8, infrequent (non-significant) noncompliance, or in compliance for the entire year. A copy of the published list of facilities in significant noncompliance shall be included.

(d) Industrial Listing - an updated industrial listing showing all current SIUs and the catergorical standard, if any, applicable to each.

(e) Summary of POTW Operations - any interference upset, or permit violations experienced at the POTW which may be attributed to industrial users, and actions taken to alleviate said events. Sampling and analysis of treatment plant influent and sludge for toxic and incompatible pollutants shall also be included with an analysis of any trends in the data since pretreatment program approval.

(f) Pretreatment Program Changes - a summary of any changes to the approved program and the date of submission to the Approval Authority.

PART C

OTHER REQUIREMENTS (Continued)

J. The permittee will ensure that applied chlorine dosages, used for disinfection or other purposes, are optimized to the degree necessary such that the total residual chlorine (TRC) in the discharge effluent does not cause an adverse stream impact. In doing so, the permittee shall consider relevant factors affecting required chlorine dosage, such as wastewater characteristics, mixing and contact times, desired result of chlorination, and expected impact on the receiving water body. The TRC data shall be recorded daily and maintained at the facility. For municipal facilities the data shall be summarized annually as part of the Chapter 94 - Municipal Wasteload Management Report.

If the Department determines or receives documented evidence that levels of TRC in the permittee's effluent are causing adverse water quality impacts in the receiving water, the permittee shall be required to institute necessary additional steps to reduce or eliminate such impact.

K. Collected screenings, slurries, sludges, and other solids shall be handled and disposed of in compliance with 25 Pa. Code, Chapters 271, 273, 275, 283,and 285 (relating to permits and requirements for landfilling, land application, incineration, and storage of sewage sludge), Federal Regulation 40 CFR 257, and the Federal Clean Water Act and its amendments.

L. The Department may identify and require certain discharge specific data to be submitted before the expiration date of this permit. Upon notification by the Department, the permittee will have 12 months from the date of the notice to provide the required data. These data, along with any other data available to the Department, will be used in completing the Watershed TMDL/WLA Analysis and in establishing discharge effluent limits.

M. Combined Sewer Overflows

Point Sources 002 through 060 (listed below) serve as combined sewer reliefs necessitated by stormwater entering the sewer system and exceeding the hydraulic capacity of the sewers and/or the treatment plant. Combined sewer overflows (CSOs) are allowed only when flows in combined sewers exceed conveyance or treatment capacities during wet weather periods. Dry weather overflows are prohibited. CSOs are point source discharges which must be provided technology-based control measures in accordance with the Clean Water Act. Additional control measures will also have to be provided if determined necessary to comply with water quality standards. At a minimum, technology-based control measures must include best management practices and/or other non-capital intensive measures to minimize discharges and water quality impacts.

OTHER REQUIREMENTS (Continued)

Discharges to Delaware River

Point Source	Interceptor Regulator Name		Location	
	Somerset Collector			
002	Castor Avenue	(D-17)	39°58'52"N	75°04'58"W
003	Venango Street	(D-18)	39°58'51"N	75°05'10"W
004	Tioga Street	(D-19)	39°58'50"N	75°05'21"W
005	Ontario Street	(D-20)	39°58'47"N	75°05'31"W
006	Westmoreland Street	(D-21)	39°58'44"N	75°05'40"W
007	Allegheny Avenue	(D-22)	39°58'39"N	75°05'49"W
008	Indiana Avenue	(D-23)	39°58'38"N	75°06'11"W
009	Cambria Street	(D-24)	39°58'35"N	75°06'25"W
010	Somerset Street	(D-25)	39°58'35"N	75°06'25"W
	Upper Delaware Collector			
011	Cottman Street	(D-2)	40°01'20"N	75°01'46"W
012	Princeton Avenue	(D-3)	40°01'13"N	75°02'00"W
013	Disston Street	(D-4)	40°01'07"N	75°02'13"W
014	Magee Street	(D-5)	40°00'58"N	75°02'35"W
015	Levick Street	(D-6)	40°00'53"N	75°02'47"W
016	Lardner Street	(0-7)	40°00'45"N	75°03'05"W
017	Comly Street	(D-8)	40°00'38"N	75°03'12"W
018	Dark Run Lane	(D-9)	40°00'34"N	75°03'18"W
019	Sanger Street	(D-11)	40°00'21"N	75°03'27"W
020	Bridge Street	(D-12)	40°00'02"N	75°03'42"W
021	Kirkbridge Street	(D-13)	39°59'52"N	75°03'47"W
022	Orthodox Street	(D-15)	39°59'24"N	75°04'04"W

Discharges to Pennypack Creek

	Upper Pennypack Collector System			
023	Frankford Avenue & Ashburner Street	(P-1)	40°02'37"N	75°01'15"W
024	Frankford Avenue & Holmesburg Street	(P-2)	40°02'37"N	75°01'16"W
025	Torresdale Avenue N.W. of Pennypack Creek	(P-3)	40°02'13"N	75°01'19"W
026	Cottage Avenue & Holmesburg Avenue	(P-4)	40°02'22"N	75°01'21"W
027	Holmesburg Avenue S.E. of Hegerman Street	(P-5)	40°02'01"N	75°01'21"W

OTHER REQUIREMENTS (Continued)

Discharges to Tacony Creek

Frankford High Level Collector System

028	Williams Avenue S.E. of Sedgewick	(T-1)	40°04'36"N	75°09'32"W
029	Champlost Avenue W. of Tacony Creek	(T-3)	40°02'30"N	75°07'04"W
030	Rising Sun Avenue E. of Tacony Creek	(T-4)	40°02'12"N	75°06'48"W
031	Rising Sun Avenue W. of Tacony Creek	(T-5)	40°02'09"N	75°06'48"W
032	Bingham Street E. of Tacony Creek	(T-6)	40°02'03"N	75°06'41"W
033	Tabor Road W. of Tacony Creek	(T-7)	40°01'51"N	75°06'42"W
034	Ashdale Street W. of Tacony Creek	(T-8)	40°01'41"N	75°06'46"W
035	Roosevelt Blvd. W. of Tacony Creek	(T-9)	40°01'37"N	75°06'48"W
036	Roosevelt Blvd. E. of Tacony Creek	(T-10)	40°01'37"N	75°06'47"W
037	Ruscomb Street E. of Tacony Creek	(T-11)	40°01'28"N	75°06'42"W
038	Witaker Avenue E. of Tacony Creek	(T-12)	40°01'23"N	75°06'42"W
039	Witaker Avenue W. of Tacony Creek	(T-13)	40°01'22"N	75°06'42"W
040	I Street & Ramona Avenue	(T-14)	40°00'58"N	75°06'27"W
041	J Street & Juniata Pk.	(T-15)	40°00'57"N	75°06'19"W
059	Rock Run Relief Sewer	(R-15)	40°02'19"N	75°06'49"W
060	Frankford Grit Diversion Chamber	(R-18)	40°00'33"N	75°05'37"W

OTHER REQUIREMENTS (Continued)

Discharges to Frankford Creek

Upper Frankford Creek Low Level

042	Castor Avenue at Unity Street (Circle)	(F-3)	40°00'57"N	75°05'51"W
043	Wingohocking Street E. of Adams Avenue	(F-4)	40°00'53"N	75°05'41"W
044	Bristol Street W. of Adams Avenue	(F-5)	40°00'40"N	75°05'41"W
045	Worrel Street E. of Frankford Creek	(F-6)	40°00'26"N	75°05'32"W
046	Worrel Street W. of Frankford Creek	(F-7)	40°00'26"N	75°05'34"W
047	Erie Avenue & Hunting Park Avenue	(F-8)	40°00'21"N	75°05'36"W
048	Frankford Avenue N. of Frankford Creek	(F-9)	40°00'20"N	75°05'34"W
049	Frankford Avenue S. of Frankford Creek	(F-10)	40°00'19"N	75°05'35"W
050	Paul Street S. of Vandyke Street	(F-11)	40°00'15"N	75°05'25"W
051	Sepviva Street N. of Butler Street	(F-12)	39°59'55"N	75°05'13"W
052	Duncan Street (under Del. Exp.)	(F-13)	40°00'15"N	75°04'57"W
053	Bristol Street(cemetary)	(F-14)	40°00'15"N	75°04'57"W
054	Wakeling Street N.W. of Creek Basin	(F-21)	40°00'15"N	75°04'57"W
055	Bridge Street N.W. of Creek Basin	(F-23)	40°00'18"N	75°04'05"W
056	Bridge Street S.E. of Creek Basin	(F-24)	40°00'19"N	75°04'05"W
057	Ash Street West of Creek Basin	(F-25)	40°00'15"N	75°04'51"W

Discharges to Delaware River

Upper Delaware Collector

058	Wakeling Street Relief Sewer	40°00'29"N	75°03'19"W

OTHER REQUIREMENTS (Continued)

1. MINIMUM TECHNOLOGY-BASED CONTROL MEASURES - PLAN OF ACTION

The permittee shall complete and implement a Minimum Technology-based Plan of Action for identification and minimization of all CSO discharges according to the following schedule:

Permit Issuance Date (PID)

Description of Activity	Due Date (actual dates to be entered at issuance)
Submit a conceptual plan to state and EPA, Region III, (3WM53)	PID + 4 months
State approval/modification of conceptual plan	PID + 6 months
Submittal of final plan to State and EPA, Region III including implementation plan and schedule	PID + 12 months
Completion of Plan recommendations final report to State and EPA, Region III	PID + 38 months

The Minimum Technology-based Limitation Plan of Action shall address at a minimum, the following measures:

a. Identification of Combined Sewer Overflows. Review and update the CSO discharge points listed above. For each CSO indicate the following measures:

i. latitude and longitude of the CSO discharge point and associated regulator mechanism.

ii. A narrative description of the location of the CSO point and regulator mechanism with respect to direction and distance from street intersections.

iii. A location map (U.S.G.S. Topographic Quadrangle) with the location of the CSO point and associated regulator mechanism indicated.

iv. A description of the size and type of regulator mechanism, including engineering drawing.

PART C

OTHER REQUIREMENTS (Continued)

v. A description of the size and type of outfall structure.

vi. A determination of whether the outfall structure is submerged, partially submerged or not submerged during times of critical condition by the receiving water.

vii. Verification of the presence or absence of a backflow prevention device on the CSO.

viii. Name of the receiving water.

ix. Development of a visual identification system on all CSO outfalls, by visually labeling the outfall pipe with a numbering system, submerged outfalls shall be identified at the nearest manhole/bulkhead.

x. Identification of CSOs near drinking water intakes, recreation areas, or unique ecological habitats.

xi. Identification of any continuous or chronic dry weather overflows.

b. System Inventory

The plan shall identify all overflow points, control structures, sewer sizes and control structure dimensions, industrial contributors and key hydraulic monitoring control points. The inventory shall include system maps, hydraulic analyses and flow measurements. Characterization of all overflows in terms of both frequency, quantity and quality; identification of the intensity and duration of the storm event that triggers an overflow.

Volume discharge from each overflow for various size storms, and number of events and total volume discharged per year based on historical rainfall records.

c. Operational Status and Assessment

Summarize the current operation status, control measures, and functional adequacy of all CSOs. A comprehensive engineering assessment of the operational status and condition of all portions of the CSO treatment works based on actual field verification/inspection records shall be included. Information on the determination of whether the sewers are cracked, depressed, or of questionable physical integrity, observances of the presence of flow restrictions due to excessive sludge or grease build-up, or other conditions, and an assessment of each regulator's and/or tide gate's operability and reliability. All dry weather overflows are prohibited.

PART C

OTHER REQUIREMENTS (Continued)

Based upon the results of the engineering inspection and assessment, the report shall include a prioritized list, strategy and schedule for rehabilitating the system and bringing it into optimal operating condition. A prioritized list for correction of any continuous dry weather overflows with schedule shall also be included.

d. Inspection and Maintenance

Summarize the regular inspection and maintenance of the combined sewer system including regulators to ensure that (1) deposition of solids does not cause obstructions which result in overflows; (2) continuous dry weather discharges are not occurring, and (3) regulators are in good working order and adjusted to minimize overflows. Identify response time between initial dry weather CSO discharge and corrective action; include a plan to reduce response time. The permittee shall submit as part of the plan of action, a written Operation and Maintenance (O&M) Plan designed to ensure the above items.

e. High Flow Management

Development of a high flow management plan which (1) maximizes the capacity of the combined sewer system for storage without causing backup or surcharge problems, and (2) enables a maximum amount of flow to be conveyed to the treatment plant without upsetting normal plant operations. Measures to be evaluated should include raising existing overflow weir levels and possible utilization of primary settling facilities for treatment if sufficient excess capacity is available, and automatic regulator and computerized control system.

f. Ordinance Revisions

Modification of the sewer ordinance where necessary to ensure prohibitions of (1) dry weather overflows, (2) construction of new combined sewers, except where sewer separation is infeasible (3) inflow sources in sanitary sewer tributary to the combined system, and (4) dumping of motor oil and excessive grease into the sewer system.

OTHER REQUIREMENTS (Continued)

g. Source Reduction

Minimization of discharges of solids and floating materials by (1) regular cleaning of streets and catch basins, (2) installation of screens on CSOs, particularly those discharging to estuary waters, (3) reduction of infiltration/inflow where feasible.

h. Pretreatment Program

Review impact of Industrial Users toxics, BOD, and total suspended solids load to CSO overflows; review and modify pretreatment programs to assure CSO impacts are minimized.

i. Minimization of CSOs near sensitive areas

Examine elimination or minimization of CSO discharges near drinking water intakes, recreation areas, or unique ecological habitats.

2. WATER QUALITY IMPACTS - PLAN OF ACTION

A water quality impact plan of action for CSOs shall be based upon the results of the Delaware River Basin Commission (DRBC) CSO Comprehensive Study of the Delaware Estuary, currently underway. The permittee shall provide any monitoring data or other information requested by DRBC for the study.

The permittee shall submit a plan of action which sets forth an implementation plan and schedule to address the conclusions and recommendations of the DRBC study within 12 months after DRBC study completion.

If the DRBC study is not completed in a timely manner, the permittee will be required to conduct a CSO water quality impact study. Additional guidance and schedule will be provided by the Department.

3. REPORTING REQUIREMENTS

The permittee shall submit semi-annual (January 1, July 1) status reports to the Department and EPA, Region III (3WM53) on the development of the Minimum Technology-based control measures plan of action, implementation of the Minimum Technology-based control measures Plan, and development of the water quality plan.

The approved CSO discharge points are identified above. Each priority CSO overflow point, as identified by an asterisk on the CSOs listed above, shall be monitored for cause, frequency, duration and quantity of flow. All monitoring data shall be recorded and submitted monthly in the format specified by the Department (attached) and shall be summarized annually with the facility's Chapter 94 Wasteload Management Report.

OTHER REQUIREMENTS (Continued)

Annual CSO Status Report

The annual CSO status report shall be submitted with the Chapter 94 - "Municipal Wasteload Management Report". The report shall provide a summary of the frequency, duration, and volume of the CSOS for the past calendar year, operational status of major overflow points and identification of known/potential instream water quality impacts and their causes. The annual report shall also summarize all actions taken and their effectiveness in implementing the approved Plans of action, and shall evaluate and provide necessary revisions to the plans approved by the Department.

N. The permittee shall operate the sewage treatment plant to provide treatment for the maximum design wastewater flows of 315 mgd (maximum daily average) and 420 mgd (peak) without causing treatment plant upsets. Throttling of influent flows to the plant resulting in avoidable, premature sewer system overflows is prohibited.

O. An average monthly flow in excess of 210 mgd shall not be considered to be a violation of this permit.

P. An application may be made to the Delaware River Basin Commission to establish alternate/equivalent $CBOD_5$ effluent mass and concentration limits to replace the BOD_5 effluent limits in this permit. Upon establishment of such limits by the Commission, the BOD_5 limits shall cease to be in effect and the $CBOD_5$ limits established by the Commission shall become effective.

Q. Biomonitoring

I. General Requirements.

The permittee shall conduct acceptable toxicity tests in accordance with the appropriate test protocols described in Section V. Test Conditions and Methods. The permittee must collect discharge samples and perform the toxicity tests to generate chronic Ceriodaphnia dubia and fathead minnow (Pimephales promelas) test results (NOEC's) which will also enable a determination of the acute (LC50) value at the 48 hour interval. For purpose of reporting, all NOEC's shall be converted to TUc's by the following equation:

$$TUc = \frac{100}{NOEC}$$

In addition, all LC50 values shall be converted to TUa's by the following equation:

$$TUa = \frac{100}{LC50}$$

OTHER REQUIREMENTS (Continued)

Within sixty (60) days of the effective date of the NPDES permit, the permittee shall submit to the Department of Environmental Resources (DER) and the Environmental Protection Agency (EPA), Region III an acceptable plan of study for determining the chronic toxicity of wastewater discharged from outfall(s) 001 through the use of whole effluent toxicity testing (biomonitoring). If DER and EPA comment on the plan, the permittee shall make any modifications requested. If the Department and EPA do not comment on the plan within thirty (30) days of submission, the permittee shall begin the whole effluent toxicity testing program as outlined in the study plan.

At a minimum the study plan should include a discussion of:

-- Wastewater and production variability.

-- Source of test organisms.

-- Source of dilution water.

-- Test conditions.

-- Sampling methods.

-- Quality assurance/quality control information (including reference toxicity results and any deviations from recommended procedures).

II. Test Frequency.

Static renewal chronic testing shall be conducted on a quarterly basis (four times per year) beginning within thirty (30) days of submission of the biomonitoring study plan, provided that the Department and EPA do not comment on the plan and request modifications within the thirty (30) day period.

Two species shall be tested, the cladoceran Ceriodaphnia dubia for survival and reproduction and the fathead minnow Pimephales promelas for survival and growth. The two species must be tested each quarter, for a total of eight tests. Additional test species may be included, based on effluent characteristics, or as methods are developed.

III. Sample Collection.

For each sampling event, three, twenty-four (24) hour discharge composite samples collected at a frequency of not greater than every two hours and flow proportioned shall be collected over a seven (7) day exposure period. The initial sample taken on day 0 is used to start the test on day 1. The additional two samples are collected on day 2 and 4 to be used on day 3 and 5, respectively. Renewal of test concentrations is conducted daily with the most recently collected discharge sample.

OTHER REQUIREMENTS (Continued)

For effluents that are chlorinated, tests shall be conducted on a final effluent sample that has been dechlorinated. Dechlorinated samples will consist of the final effluent composites treated with sodium thiosulfate (see Section 7.4 of Weber, C.I, etal (ed). 1989. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms).

All samples held overnight shall be refrigerated at 4°C.

IV. Dilution Water.

The dilution water source must consist of either moderately hard synthetic water (using either Millipore Milli-QR or equivalent deionized water and reagent grade chemicals) or deionized water (80%) combined with Perrier or chemically equivalent mineral water (20%).

V. Test Conditions and Methods.

The test conditions and methods shall conform to those developed by EPA as specified in the documents cited below. If DER or EPA determine that the proper test conditions have not been followed or if the test acceptability criteria are not met, the permittee must perform a re-test within thirty (30) days.

Weber, C.I. et al. (ed.). 1989. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms. Second Edition. Office of Research and Development, Cincinnati, OH. EPA/600/4-89-001.

Weber, C.I. (ed) 1991. Methods for Measuring the Acute Toxicity of Effluents and receiving water to Freshwater and Marine Organisms, Fourth Edition. Office of Research and Development, Cincinnati, OH. EPA/600/4-90/027.

U.S. Environmental Protection Agency. 1991. Technical Support Document for Water Quality-based Toxics Control. Office of Water, Washington, DC EPA/505/2-90-001.

A. Summary of effluent toxicity test conditions and test acceptability criteria for the Ceriodaphnia dubia survival and reproduction test (adapted from EPA/600/4-89/001).

1. Renewal of test solutions: daily using most recently collected sample

PART C

OTHER REQUIREMENTS (Continued)

2.	Effluent concentrations:	5 concentrations and a control. An additional control (0% effluent) treated with the same concentration of sodium thiosulfate as used to dechlorinate the effluent sample will be run. If the initial sample has no chlorine present, start the additional control with no sodium thiosulfate
3.	Dilution factor:	0.5
4.	Test duration:	Until 60% of control animals have three broods (7 days or less)
5.	Sampling requirements:	A minimum of three samples are collected to be used on days 1, 3, and 5 for renewal. Test samples must be first used within 36 hours of collection.
6.	Sample volume required:	Minimum of 1 liter per day.
7.	Test acceptability criterion:	80% or greater survival and an average of 15 or more young per surviving animal in the control solutions. At least 60% of the surviving animals in controls must have produced their third brood in seven days or less.

B. Summary of effluent toxicity test conditions and test acceptability criteria for the fathead minnow (Pimephales promelas) survival and reproduction test (adapted from EPA/600/4-89/001).

1.	Test chamber size:	250-1000 ml
2.	Test solution volume:	200 ml/replicate (minimum)
3.	Number of larvae per test chamber:	10
4.	Number of replicate test chambers per concentration:	4

OTHER REQUIREMENTS (Continued)

5. Number of larvae per test concentration: 40

6. Feeding regime: Feed 0.1 ml newly hatched brine shrimp nauplii (less than 24 hours old) twice daily at 6 hour intervals (at the beginning of the work day prior to renewal, and at the end of the work day following renewal). Sufficient nauplii are added to provide an excess. Larvae are not fed during the final 12 hours of the test.

7. Effluent concentrations, Dilution series, Sampling requirements, and Renewal of test solution: Same as Section V. Test Conditions and Methods Part A, summary of effluent toxicity test conditions and test acceptability criteria for the Ceriodaphnia dubia survival and reproduction test.

8. Sample volume required: Minimum of 2.5 liters per day.

VI. Chemical Analyses

Chemical analysis shall be performed for each sampling and testing events as described below.

A. The following chemical analysis shall be performed for each sampling event, including each new batch of dilution water:

Parameter	Effluent	Diluent	Detection Limit (mg/l)
Hardness	x	x	0.5
Alkalinity	x	x	2.0
pH	x	x	--
Specific Conductance	x	x	--
Total Residual Chlorine	x		0.02

OTHER REQUIREMENTS (Continued)

B. The following chemical analyses shall be performed as part of each daily renewal procedure on each dilution and the controls.

Parameter	Effluent	Diluent
Dissolved oxygen	x	x
Temperature	x	x
pH	x	x
Specific Conductance	x	x

In addition to the chemical analysis required above, those parameters listed in Part A of the NPDES permit for the outfall(s) 001 tested will be analyzed on at least the initial (day 0) sample by using the method specified in the NPDES permit or, if not specified, by EPA and DER (Chapter 16, Water Quality Toxics Management Strategy) approved methods

VII. Toxicity Test Report Elements.

The following must be reported:

-- Description of sample collection procedures and of the sample location.

-- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis.

-- General test description: origin and age of test organisms, dates and results of reference toxicant tests; light and temperature regimes; other information on test conditions is listed in Section V. Test Conditions and Methods.

-- All chemical and physical data generated (include detection limits).

-- Copies of raw data sheets and/or bench sheets.

-- Dechlorination procedure(s).

-- Any other observations or test conditions affecting the test outcome.

OTHER REQUIREMENTS (Continued)

Toxicity test data that is required includes the following:

-- Comparison of performance of controls with test acceptability criteria.

-- Daily survival of test organisms in the controls and all replicates for each dilution. Survival data should be analyzed by Fisher's exact test prior to analysis of reproduction data.

-- NOEC: No Observed Effect Concentration.

-- LOEC: Lowest Observed Effect Concentration.

-- Chronic Value (ChV): Geometric mean of the NOEC and LOEC.

-- Acute endpoints shall be derived from data obtained 48 hours into the chromic test. Survival data for each concentration and replication at 24 hours and 48 hours shall be obtained. LC50 and 95% confidence limits shall be calculated using the following methods: binomial, moving average, moving average-angle, probit, trimmed Spearman-Karber, or the graphical method (EPA/600/4-85/013). All printouts or copies of hand calculations must be submitted. The probit, trimmed Spearman-Karber, and moving average-angle methods can only be used when at least two test concentrations exhibit some (but not all) test organism mortality (partial mortality). If a test results in a 100% survival in one test concentration, and 100% mortality in an adjacent concentration (an "all or nothing" effect), and LC50value can be estimated using the graphical method.

Chronic reference toxicant tests, on both species, shall be conducted monthly in laboratories that maintain their own culturing facilities, while laboratories that secure test organisms from outside suppliers shall conduct chronic reference toxicant test on each separate batch of test organisms. These tests shall be conducted similarly to the effluent toxicity test (same dilution water, test organisms and conditions, chemical analyses, etc.) and shall follow guidelines put forth in EPA/600/4-89/001. The reference toxicant shall be a commonly used toxicant approved by the EPA. Reports of reference toxicant tests shall include all information needed for the propert evaluation of the test, including (but not limited to) the following:

-- Water chemistry parameters of controls and test concentrations.

-- Chronic and if applicable, acute endpoint(s), with appropriate statistical analyses.

OTHER REQUIREMENTS (Continued)

-- Control charts (for point estimates, cumulative mean + two standards deviations; or NOEC's central tendency + one concentration interval).

VIII. Reporting

Signed copies of each toxicity test's data/reports shall be submitted to DER and EPA at the addresses listed below within thirty (30) days of test completion, so that each individual test result can be reviewed and evaluated for content and performance prior to the initiation of the succeeding quarterly test.

If after review of test data, EPA or the Department may instruct the city to make appropriate changes in the test procedures.

U.S. Environmental Protection Agency, Region III
PA/DC Permit Section, 3WM53
841 Chestnut Building
Philadelphia, PA 19107

PA Department of Environmental Resources
Bureau of Water Quality Management
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

R. This permit may be reopened to incorporate the requirements or recommendations resulting from the Estuary Toxics Management Study being conducted by the Delaware River Basin Commission.

OTHER REQUIREMENTS (Continued)

S. Chlorine Minimization Plan

The permittee shall implement a Chlorine Minimization Plan similar to the Southwest Chlorine Minimization Plan submitted to EPA 4/2/91, according to the following schedule:

Permit Issuance Date (PID)

Description of Activity	Due Date (actual dates to be entered at issuance)
Chemical and Toxicity Evaluation issuance)	PID + 12 months
Determination of minimal chlorine dose necessary to achieve fecal coliform level of <200MPN/100 ml.	
Evaluation of toxicity of sample using minimal chlorine dosage and the minimal dosage plus a margin of safety.	
Evaluation of toxicity of dechlorinated post chlorinated effluent.	
Chemical evaluation of chlorinated and dechlorinated effluent.	
Engineering evaluation of facility's ability to reduce effluent toxicity by maintaining minimum chlorine dose or dechlorination of effluent.	PID + 15 months
Evaluate whether an alternative disinfection system or modification of existing chlorination system should be used.	PID + 20 months
Selection of control option	PID + 26 months
Implementation of selected option	PID + 38 months

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
FIELD OPERATIONS - WATER QUALITY MANAGEMENT
Suite 6010, Lee Park
555 North Lane
Conshohocken, PA 19428
215 832-6130

JUL 22 1992

City of Philadelphia Water Department
Executive Offices, 5th Floor
ARA Tower
1101 Market Street
Philadelphia, PA 19107

Attention: Mr. Kumar Kishinchand
Commissioner

Re: NPDES Draft Permit PA 0026689
City of Philadelphia Water Department
City of Philadelphia
Philadelphia County

Gentlemen:

A copy of the referenced draft permit for the discharge(s) from your facility is enclosed. Also, enclosed are four copies of the public notice which will be published in the Pennsylvania Bulletin within the next three weeks. A public comment period of thirty days will follow publication.

The copies of the public notice should be posted near the entrance to your premises and in nearby places.

Your attention is directed to Speical Condition M of Page 14e of 14 as it applies to combined sewer overflow (CSO) discharges. A requirement of this condition is that certain priority overflows must be monitored on a monthly basis for cause, frequency, duration and quantity of flow. In order to implement this condition, we request your assistance in identifying appropriate CSOs for monitoring. Please suggest ten (10) overflow points that you feel represent the various land use activities of the areas that discharge to the combined sewer system. We request that the suggested overflows be submitted prior to the conclusion of the public comment period.

JUL. 2 2 1992

City of Philadelphia Water Department

The draft permit should be carefully reviewed. We would appreciate if any questions or comments on the draft permit would be submitted within 30 days to Denis Strittmatter of my staff.

Very truly yours,

JAMES NEWBOLD
Chief, Permits Section

ENCLOSURES

cc: BCM Engineers, Inc.
Re 30 (NPDW).1

Southeast Water Pollution Control Plant
Existing And Draft NPDES Permits

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
1875 New Hope Street
Norristown, PA 19401
215 270-1975

cc J.C
Jim

September 22,1986

Southeast Water Pollution Plant
City of Philadelphia Water Department
Executive Offices, 5th Floor
One Reading Center
1101 Market Street
Philadelphia, PA 19107

Attention: William J. Marrazzo
Commissioner

Re: Sewage NPDES Permit PA 0026662
Southeast Water Pollution
Control Plant
City of Philadelphia
Water Department
Philadelphia County

Gentlemen:

Referenced permit is enclosed.

In accordance with Other Requirements Item G (p. 14) please note that work is to begin on a Toxics Reduction Plan by November 1, 1986. The first progress report is due on May 1, 1987. For your reference, we have enclosed a copy of the "Guidelines for Conducting a Toxics Reduction Evaluation" dated October, 1985.

It will be necessary for you to submit a completed Discharge Monitoring Report (DMR) on a monthly basis to the appropriate agencies (see p. 5 of the NPDES permit and Other Requirements p. 14).

The Environmental Protection Agency will be sending you computer generated, preprinted discharge monitoring report (DMR) forms for your submittals. In the event that these forms are not received, use the attached DMR forms. Should you find significant discrepancies between the two versions, contact this office and use the attached form until the preprinted forms are corrected. Do not allow a problem with the preprinted forms to cause your failure to submit these reports in a timely manner as this will result in violations of your permit.

Please study the permit carefully and direct any questions to the Permits Section of this office.

To become operative this permit must be recorded in the Office of the Recorder of Deeds in the county in which the discharge is located. Enclosed is a certificate and pre-addressed envelope for this purpose. Please have the Recorder of Deeds accomplish the certificate and return it within ten (10) days.

Very truly yours,

Joseph A. Feola

JOSEPH A. FEOLA
Regional Water Quality Manager

ENCLOSURES: Permit
Master Discharge Monitoring Report
Recorder of Deeds Certificate with envelope
Notary Public Certificate
Guidelines for Conducting a Toxics Reduction Evaluation (Revised October, 1985)
Analytical Methods and Sampling Collection, Preservation and Handling Techniques for the 126 Priority Pollutants (January, 1985)
Suggested Method for the Determination of Free Cyanide (Draft May, 1984)

cc: Mr. William Wankoff, Philadelphia Water Department(Transmittal Letter Only)
EPA
DRBC
Permits & Compliance
Re 30 (2NPDW10)

ER-PWQ-15.2 (3/81)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF WATER QUALITY MANAGEMENT

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
SEWAGE PERMIT NO. PA 0026662

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 et seq. (the "Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 et seq.,

Southeast Water Pollution Control Plant
City of Philadelphia Water Department

is hereby authorized to discharge from a facility located in

City of Philadelphia
Philadelphia County

to the receiving waters named

Delaware River (Zone 3) Point Sources 001 through 017 and 020 through 037

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B, and C hereof.

This permit and the authorization to discharge shall expire at midnight 9/22/91.

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the standard or special conditions, and the terms and conditions of this permit, the terms and conditions shall apply.

2. Failure to comply with any of the terms or conditions of this permit is grounds for enforcement action; for permit termination, revocation and reissuance or modification; or for denial of a permit renewal application.

3. It is required by law that this permit, before becoming operative, shall be recorded in the Office of the Recorder of Deeds for the county wherein the outlet of said sewer system is located.

4. Application for renewal of this permit, or notification of intent to cease discharging by the expiration date, must be submitted to the Department at least 180 days prior to the above expiration date (unless permission has been granted by the Department for submission at a later date), using the appropriate NPDES Permit Application Form. In the event that a timely and complete application for renewal has been submitted and the Department is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit will be automatically continued and will remain fully effective and enforceable pending the grant or denial of the application for permit renewal.

5. This permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

PERMIT ISSUED

DATE 9/22/86

BY Joseph A. Feola

TITLE

Joseph A. Feola

II. MONITORING AND REPORTING

A. Representative Sampling and Test Procedures

1. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Unless otherwise specified in this permit, the test procedures for analysis of pollutants shall be those contained in 40 CFR Part 136, or alternate test procedures approved pursuant to that part.

B. Self-Monitoring and Reporting Requirements

The permittee shall effectively monitor the operation and efficiency of all treatment and control facilities and the quantity and quality of the discharge. Monitoring data required by this permit shall be submitted monthly.

A Discharge Monitoring Report (DMR) properly completed and signed by the treatment plant operator in responsible charge, must be submitted within 45 days after the end of each monthly report period. Notification of the designatic of the responsible operator must be submitted to the permitting agency by the permittee within 60 days after the effective date of the permit and from time to time thereafter as the operator is replaced. The DMR must be sent to the Department and the EPA Regional Office at the following addresses:

Department of Environmental Resources
Bureau of Water Quality Management
1875 New Hope Street
Norristown, Pennsylvania 19401

Pennsylvania Section (3WM52)
Permits, Water Branch
Water Division
U.S. Environmental Protection Age
Region III
841 Chestnut Building
Philadelphia, PA 19106

C. If the permittee monitors any pollutant, using analytical methods described in Part A.2.A(2) above, more frequently than the permit requires, the results of this monitoring shall be incorporated, as appropriate, into the calculations used to report self-monitoring data on the DMR.

D. Non-Compliance Reporting

1. 24-Hour Reporting:

The permittee shall orally report to the Department within 24 hours of becoming aware of the following:

(a) Actual or anticipated non-compliance with any term or condition of this permit which may endanger health or the environment.

(b) Actual or anticipated non-compliance with any "maximum daily" discharge limitation which is identified in Part A1 of this permit as being either:

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001; LOCATED AT LATITUDE 75°08'09", LONGITUDE 39°54'07"

A. During the period beginning at issuance and lasting through expiration, the Permittee is authorized to discharge.
B. The average monthly flow of effluent discharged from the wastewater treatment facility shall not exceed 112 million gallons per day. (a)
C. The quality of effluent shall be limited at all times as specified in Footnote (3) and as follows:

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)			CONCENTRATIONS (mg/l)						
	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.
FLOW (MGD)								Continuous	Measured	
BOD-5 (b)	19650	29475		30	45		60	Daily	24 Hour Comp.	
BOD-5 % REMOVAL	DRBC ZONE 3 REQUIREMENT OF 86%							Daily	24 Hour Comp.	
SUSPENDED SOLIDS	28025	42035		30	45		60	Daily	24 Hour Comp.	
FIRST STAGE OXYGEN DEMAND(c)	33600							2/Week	24 Hour Comp.	
FECAL COLIFORM (5-1 to 9-30)				See Footnote (2)				Daily	Grab	
FECAL COLIFORM (10-1 to 4-30)				Same Limits as in Footnote (2)				Daily	Grab	
pH	Within Limits of 6 to 9 Standard Units at all times (f)							Daily	Grab	
NH_3-N				Monitor Only				1/Week	24 Hour Comp.	
TKN				Monitor Only				1/Week	24 Hour Comp.	
NO_3-N				Montior Only				1/Week	24 Hour Comp.	
NO_2-N				Monitor Only				1/Week	24 Hour Comp.	

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001; LOCATED AT LATITUDE 75°08'09", LONGITUDE 39°54'07"

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)			CONCENTRATIONS (mg/l)						
	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.1
BERYLLIUM, TOTAL (d) & (e)				MONITOR ONLY				2/Month	24 Hr. Comp.	
IRON, DISSOLVED (d)				MONITOR ONLY				2/Month	24 Hr. Comp.	
ALUMINUM, TOTAL (d)				MONITOR ONLY				2/Month	24 Hr. Comp.	
CYANIDE, FREE (d) & (e)				MONITOR ONLY				2/Month	24 Hr. Comp.	
PHENOLICS, TOTAL (4AAP) (d)				MONITOR ONLY				2/Month	24 Hr. Comp.	
TETRA- (d) CHLOROETHYLENE				MONITOR ONLY				1/Month	Grab	
PHENOL (d)				MONITOR ONLY				1/Month	24 Hour Comp.	
CHLORODIBROMO-METHANE+ (d)&(e)				MONITOR ONLY				1/Month	Grab	
METHYLENE CHLORIDE+(d)&(e)				MONITOR ONLY				1/Month	Grab	
DICHLOROBROMO-METHANE (d)&(e)				MONITOR ONLY				1/Month	Grab	

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001;
LOCATED AT LATITUDE 75°08'09", LONGITUDE 39°54'07"

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)			CONCENTRATIONS (mg/l)						
	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.1
PCB 1260 (d)&(e)					MONITOR ONLY			1/Month	24 Hour Comp.	
PHENANTHRENE (d)&(e)					MONITOR ONLY			1/Month	24 Hour Comp.	
CHLOROFORM (d)&(e)					MONITOR ONLY			1/Month	Grab	
CADMIUM, TOTAL (d)&(e)					MONITOR ONLY			2/Month	24 Hour Comp.	
LEAD, TOTAL (d)&(e)					MONITOR ONLY			2/Month	24 Hour Comp.	
MERCURY, TOTAL (d)					MONITOR ONLY			2/Month	24 Hour Comp.	
NICKEL, TOTAL (d)&(e)					MONITOR ONLY			2/Month	24 Hour Comp.	
SILVER, TOTAL (d)&(e)					MONITOR ONLY			2/Month	24 Hour Comp.	
ZINC, TOTAL (d)					MONITOR ONLY			2/Month	24 Hour Comp.	
BARIUM, TOTAL (d)					MONITOR ONLY			2/Month	24 Hour Comp.	
TIN, TOTAL (d)&(e)					MONITOR ONLY			2/Month	24 Hour Comp.	
TITANIUM, TOTAL (d)&(e)					MONITOR ONLY			2/Month	24 Hour Comp.	

FOOTNOTES:
(a) See Paragraph L, Other Requirements (page 14g of 14).
(b) See Paragraph M, Other Requirements (page 14h of 14).
(c) First Stage Oxygen Demand - (20 Day Biochemical Oxygen Demand Test with Nitrogenous Oxygen Demand Inhibited).
(d) See Other Condition G, Water Quality - Based Effluent and Other Requirements for Management of Toxic Pollutants, (page 14a of 14).
(e) See Other Condition H, For Specific Test Methods (page 14d of 14).
(f) See Paragraph N, Other Requirements (page 14h of 14).

1. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfall 001 at the pier effluent sampling building.

(Footnotes Continued)

2. Effective disinfection to control disease producing organisms during the swimming season (May 1 through September 30) shall be the production of an effluent which will contain a concentration not greater than 200/100 ml of fecal coliform organisms as a geometric average value, nor greater than 1,000/100 ml of these organisms in more than 10% of the samples tested.

3. In no case shall the arithmetic means of the effluent values of th BOD_5 and Suspended Solids discharged during a period of 30 consecu days exceed 14% and 15% respectively of the associated arithmetic m of the influent values for those parameters during the same time period, except as specifically authorized by the permitting author

D. Definitions

1. The term "bypass" means the discharge of partially treated or untreated sewage from any device or structure of sewerage facilities due to a power failure, equipment failure, hydraulic overload, and/or blockage in all or any part of the sewerage facilities. This is to distinguish it from an overflow which is the systematic discharge of a mixture of partially treated or untreated sewage and stormwater from any device or structure of combined sewerage facilities which is in excess of the downstream hydraulic carrying capacity of these facilities.

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

3. The "average monthly flow" means the arithmetic mean of daily flow measurements taken during a calendar month.

4. The "average monthly" mass discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the facility was operating. Where less than daily sampling is required by this permit, the (average) monthly mass discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made.

5. The "average weekly" mass discharge means the total discharge by weight during a calendar week divided by the number of days in the week that the facility was operating. Where less than daily sampling is required by this permit, the (average) weekly mass discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar week when the measurements were made.

6. The "maximum daily" mass discharge means the total discharge by weight during any calendar day.

7. The "average monthly" effluent concentration means the arithmetic average of all the daily determinations of concentration made during a calendar month.

8. The "average weekly" effluent concentration means the arithmetic average of all the daily determinations of concentration made during a calendar week.

9. The "maximum daily" effluent concentration means the daily determination of concentration for any calendar day.

10. The "instantaneous maximum" concentration means the concentration not to be exceeded at any time in any grab sample.

11. The "daily determination of concentration" means the concentration of a composite sample taken during a calendar day or the arithmetic average of all grab samples taken during a calendar day.

12. The term "composite sample" means a combination of individual samples obtained at regular intervals over a time period. The maximum time period between individual samples shall not exceed two hours.

13. The term "grab sample" means an individual sample collected in less than 15 minutes.

14. The term "measured flow" means any method of liquid volume measurement the accuracy of which has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.

15. The term "estimate" means to be based on a technical evaluation of the sources contributing to the discharge including, but not limited to, pump capabilities, water meters and batch discharge volumes.

16. The term "Industrial User" means an establishment which discharges or introduces industrial wastes into a Publicly Owned Treatment Works (POTW).

17. The term "Publicly Owned Treatment Works" or "POTW" means a facility as defined by Section 212 of the Clean Water Act which is owned by a State or Municipality, as defined by Section 502(4) of the Clean Water Act, including any sewers that convey wastewater to such a treatment works, but not including pipes, sewers or other conveyances not connected to a facility providing treatment. The term also means the municipality as defined in Section 502(4) of the Clean Water Act which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.

(i) A toxic pollutant effluent standard established by EPA pursuant to Section 307(a) of the Clean Water Act, or

(ii) A toxic or hazardous pollutant which, if not adequately treated, could constitute a threat to human health, welfare, or the environment,

(iii) Any pollutant identified as the method to control a toxic pollutant or hazardous substance (i.e., indicator pollutant).

(c) Any unanticipated bypass which exceeds any effluent limitations in the permit.

(d) Where the permittee orally reports this information within the above mentioned 24 hour time period, a written submission outlining the above information must be submitted to the Department within 5 days of becoming aware of such a condition, unless this requirement is waived by the Department upon receipt of the oral report.

2. Other Non-Compliance Reporting.

(a) The permittee shall give advance notice to the Department of any planned changes to the permitted activity or facility which may result in non-compliance with permit requirements.

(b) Where the permittee knows in advance of the need for a bypass which will exceed effluent limitations it shall submit prior notice to the Department at least 10 days, if possible, before date of the bypass.

(c) The permittee shall report all instances of non-compliance which are not reported above at the time of DMR submission.

3. The reports and notifications required above shall contain the following information:

(a) A description of the discharge and cause of non-compliance;

(b) The period of non-compliance, including exact date and times and/or the anticipated time when the discharge will return to compliance; and

(c) Steps being taken to reduce, eliminate, and prevent recurrence of the non-complying discharge.

E. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

1. The exact place, date, and time of sampling or measurement.
2. The person(s) who performed the sampling or measurement.
3. The dates the analyses were performed.
4. The person(s) who performed the analyses.
5. The analytical techniques or methods used.
6. The results of such analyses.

F. Records Retention

All records of monitoring activities and results (including all original strip chart recordings for continuous monitoring instrumentation and calibration and maintenance records), copies of all reports required by this permit, and records of all data used to complete the application for this permit shall be retained by the permittee for three (3) years. The three year period shall be extended as requested by the Department or the EPA Regional Administrator.

III. SCHEDULE OF COMPLIANCE

The permittee shall achieve compliance with final effluent limitations or terminate this discharge in accordance with the following schedule:

A. Feasibility study completion _____

B. Final plan completion _____

C. Start construction _____

D. Construction progress report(s) _____

E. End construction _____

F. Compliance with effluent limitations _____

G. Terminate discharge _____

No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit to the Department a written notice of compliance or non-compliance with the specific schedule requirement(s). Each notice of non-compliance shall include the following information:

A. A short description of the noncompliance.

B. A description of any actions taken or proposed by the permittee to comply with the elapsed schedule requirement.

C. A description of any factors which tend to explain or mitigate the noncompliance.

D. An estimate of the date that compliance with the elapsed schedule requirement will be achieved and an assessment of the probability that the next scheduled requirement will be met on time.

I. MANAGEMENT REQUIREMENTS

A. Publicly Owned Treatment Works (POTW)

1. Where the permittee is a Publicly Owned Treatment Works (POTW), the permittee shall provide adequate notice as discussed in A(2) below to the Department of the following:

   (a) Any new introduction of pollutants into the POTW from an Industrial User which would be subject to Sections 301 and 306 of the Clean Water Act if it were otherwise discharging directly into waters of the United States.

   (b) Any substantial change in the volume or character of pollutants being introduced into the POTW by an Industrial User which was discharging into the POTW at the time of issuance of this permit.

   (c) Any change in the quality and quantity of effluent introduced into the POTW.

   (d) The identity of significant Industrial Users served by the POTW which are subject to pretreatment standards adopted under Section 307(b) of the Clean Water Act; the POTW shall also identify the character and volume of pollutants discharged into the POTW by the Industrial User.

2. The submission of the above information in the POTW's annual Wasteload Management Report, required under the provisions of 25 Pa. Code Chapter 94 will normally be considered as providing adequate notice to the Department. However, if the above changes in industrial pollutant loadings to the POTW are significant enough to warrant either modification or revocation and reissuance of this permit, then the permittee is required to meet the provisions of Management Requirements B below.

3. The POTW shall require all Industrial Users to comply with the reporting requirements of Sections 204(b), 307, and 308 of the Clean Water Act and any regulations adopted thereunder, and the Clean Streams Law and any regulations adopted thereunder.

B. Permit Modification, Termination, or Revocation and Reissuance

1. This permit may be modified, terminated, or revoked and reissued during its term for any of the causes specified in 25 Pennsylvania Code, Chapter 92.

2. The filing of a request by the permittee for a permit modification, revocati and reissuance, or a notification of planned changes or anticipated non-compliance does not stay any permit condition.

3. Notwithstanding the above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for toxic pollutant which is present in the discharge authorized herein and such standard or prohibition is more stringent than any limitation upon such pollutant in this permit, this permit shall be modified or revoked and reissued in accordance with the toxic effluent standard or prohibition and the permittee shall be so notified.

In the absence of a Departmental action to modify or to revoke and reissue this permit, any toxic effluent standard or prohibition established under Section 307(a) of the Act is considered to be effective and enforceable against the permittee.

C. Right of Entry

Pursuant to Sections 5(b) and 305 of Pennsylvania Clean Streams Law and 25 Pennsylvania Code, Chapter 92, the permittee shall allow the head of the Department, the EPA Regional Administrator, and/or their authorized representatives, upon the presentation of credentials:

1. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit.

2. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit and other document as may be required by law.

3. To inspect at reasonable times any monitoring equipment or monitoring method required in this permit.

4. To inspect any collection, treatment, pollution management, or discharge facilities required under the permit.

5. To sample any substances or parameters at any location.

D. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges; nor does it authorize any injury to private property or any invasion of personal rights.

E. Duty to Provide Information

1. The permittee shall furnish to the Department within a reasonable time, any information which the Department may request to determine whether cause exists for modifying revoking and reissuing, or terminating this permit, or to determine compliance with this permit.

2. The permittee shall furnish to the Department, upon request, copies of records required to be kept by this permit.

3. Planned changes: The permittee shall give advance notice to the Department of any physical alterations or additions to the permitted facility.

4. Other Information: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information to the Department.

F. Confidentiality

Except for data determined to be confidential under 25 Pennsylvania Code, Chapter 92, all required reports shall be available for public inspection at the offices of the Department and the EPA Regional Administrator. Effluent data shall not be considered confidential.

G. Facility Operation and Quality Control

The permittee shall at all times maintain in good working order and properly operate all facilities and systems (and related appurtenances) for collection and treatment which are installed or used by the permittee for water pollution control and abatement to achieve compliance with the terms and conditions of the permit. Proper operation and maintenance includes but is not limited to effective performance based on designed facility removals, adequate funding, effective management, adequate operator staffing and training, and adequate laboratory and processing controls including appropriate quality assurance procedures. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with this permit.

H. Bypassing

1. Bypassing Not Exceeding Permit Limitations: The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if the bypass is for essential maintenance to assure efficient operation. This type of bypassing is not subject to the reporting and notification requirements of Part A.2.D above.

2. In all other situations, bypassing is prohibited unless the following conditions are met:

   (a) A bypass is unavoidable to prevent loss of life, personal injury or "severe property damage";

   (b) There are no feasible alternatives to a bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment down-time; (This condition is not satisfied if the permittee could have installed adequate backup equipment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance.); and

   (c) The permittee submitted the necessary reports required under Part A.2. above.

3. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the conditions listed under Part B.I.2. above.

I. Adverse Impact

Permittee shall take all reasonable steps to minimize any adverse impact on the environment resulting from noncompliance with this permit.

J. Solids Disposal

Collected screenings, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those waters (or runoff from the wastes) into waters of the Commonwealth.

K. Penalties and Liability

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

2. Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for non-compliance pursuant to Section 309 of the Clean Water Act or Sections 602 or 605 of the Clean Streams Law.

L. Transfer of Ownership or Control

1. No permit may be transferred unless approved by the Department.

2. In the event of any pending change in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the Department by letter of such pending change at least thirty days prior to the change in ownership or control.

3. The letter shall be accompanied by the appropriate Department forms for transfer of the permit and a written agreement between the existing permittee and the new owner or controller stating that the existing date of permit transfer and that the new owner or controller shall be liable for permit violations from that date on.

4. After receipt of the documentation above, the Department shall notify the existing permittee and the new owner or controller of its decision concerning approval of the transfer. In approving a transfer the Department may modify or revoke and reissue the permit.

5. In the event the Department does not approve transfer of the permit, the new owner or controller must submit a new permit application.

M. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

N. Other Laws

Nothing herein contained shall be construed to be an intent on the part of the Department to approve any act made or to be made by the permittee inconsistent with the permittee's lawful powers or with existing laws of the Commonwealth regulating sewerage discharge and the practice of professional engineering, nor shall this permit be construed to sanction any act otherwise forbidden by federal or state law or regulation, or by local ordinance. Nor does it pre-empt any duty to obtain State or local assent required by law for the discharge(s).

PART C

OTHER REQUIREMENTS

A. Effluent limitations, monitoring requirements, and other standard and special conditions which relate to the discharge(s) of pollutants authorized by this permit and which are contained in Water Quality Management Permit(s)

Nos. 9209S and 5173402 issued on February 25, 1959 and October 19, 1973

are superseded by the terms and conditions of this permit, unless specifically noted otherwise herein.

B. A copy of the Discharge Monitoring Report is to be sent to the following agency:

Delaware River Basin Commission
P.O. Box 7360
West Trenton, New Jersey 08628

C. The approval herein given is specifically made contingent upon the permittee acquiring all necessary property rights by easement or otherwise, providing for the satisfactory construction, operation, maintenance and replacement of all sewers or sewerage structures associated with the herein approved discharge in, along, or across private property, with full rights of ingress, egress and regress.

D. For reporting purposes on the Discharge Monitoring Report, the term "average weekly" shall mean the highest average weekly value observed during the monthly monitoring period.

E. If, in the opinion of the Department, the sewage treatment plant is not so operated or if by reason of change in the character of the waste or increased load upon the sewage treatment plant, or changed use or condition of the receiving body of water, or otherwise, that the effluent ceases to be satisfactory or the sewage treatment plant creates a public nuisance, then upon notice by the Department the right herein granted to discharge such effluent shall cease and become null and void unless within the time specified by the Department, the permittee shall adopt such remedial measures as will produce an effluent which, in the opinion of the Department, will be satisfactory for discharge into the receiving body of water.

F. The BOD_5 in the raw wastewater shall be reduced by at least 86% as a monthly average in accordance with the requirements of the Delaware River Basin Commission for Zone 3 of the Delaware Estuary. The percent removal shall be calculated from daily 24 hour composite samples of the influent and effluent. The influent samples must reflect true characteristics of the raw wastewater and must not be affected by plant recycle flows.

PART C

OTHER REQUIREMENTS

G.. Water Quality-Based Effluent Limitations and Other Requirements for Management of Toxic Pollutants

a. Water Quality-Based Effluent Limitations

In addition to the effluent limitations shown in Part A of this permit, the Permittee is expected to achieve the water quality-based effluent limitations shown below.

No final date for compliance with these limitations is shown. The Department will modify this permit to establish a final compliance date, if necessary, upon the submittal by the Permittee and review by the Department of an acceptable Toxics Reduction Evaluation (TRE), or the failure of the Permittee to submit an acceptable TRE under the schedule established under Section G.b. of this Part C. The Permittee must submit the following requests, along with supporting documentation, to the Department at the time of submission of the TRE:

(1) A request for modification of water quality-based effluent limitations shown below; and/or;

(2) A request for an extension of time to achieve the water quality-based effluent limitations shown below; and/or,

(3) A request for alternative bioassay-based effluent limitations.

For purposes of compliance, effluent limitations listed in Part A of this permit apply unless changed by order, permit modification or other Department action.

Submittal by the Permittee of a TRE shall not be deemed to affect the appeal rights of the Permittee of final water quality-based effluent limitations upon action of the Department to make the limitations effective.

Outfall 001

Parameter	Units	Average Monthly	Maximum Daily	Instantaneous Maximum
Beryllium, Total	mg/l		Not Detectable	
Iron, Dissolved	mg/l	1.5		3.0
Aluminum, Total	mg/l	2.3		4.6
Cyanide, Free	mg/l	0.011		0.022
Phenolics, Total (4AAP)	mg/l	0.011		0.022
Tetrachloro-ethylene	mg/l		0.024	
PCB 1260			Not Detectable	
Phenanthrene	mg/l		Not Detectable	
Chloroform	mg/l		0.005	

PART C

OTHER REQUIREMENTS

Parameter	Units	Monthly	Daily	Maximum
Cadmium, Total	mg/l	0.004		0.008
Lead, Total	mg/l	0.09		0.18
Mercury, Total	mg/l	0.002		0.004
Nickel, Total	mg/l	0.024		0.048
Silver, Total	mg/l	0.004		0.008
Zinc, Total	mg/l	0.18		0.36
Barium, Total	mg/l	1.8		3.6
Tin, Total	mg/l	0.036		0.072
Titanium, Total	mg/l	0.11		0.22
Phenol	mg/l		0.011	
Chlorodibromo-methane+ Methylene Chloride+ Dichlorobromo-methane	mg/l		Sum of these three parameters must not exceed 0.003	

b. Toxics Reduction Evaluation (TRE)

In order to (1) verify the actual extent of the toxic pollutants associated with the wastewater, (2) determine sources of these toxic pollutants, and (3) recommend control and/or treatment technologies to reduce or eliminate these toxic pollutants, the Permittee is directed to carry out a Toxics Reduction Evaluation (TRE) in accordance with guidelines developed by the Department.

The Permittee shall submit three (3) copies of the completed TRE to the Department for review in accordance with the following schedule:

Step	Date
Begin Work on the TRE and so Notify the Department	11/01/86
Submit a Progress Report to the Department	05/01/87
Submit a Progress Report to the Department	11/07/87
Submit a Progress Report to the Department	05/01/88
Submit the Completed TRE to the Department	11/01/88

c. Modification of Permit to Incorporate Water Quality-Based Effluent Limitations for Toxic Pollutants

Upon approval of the TRE and any additional submittals for the above toxic pollutants of concern, the Department will modify Part A of this permit to reflect the effluent limitations, monitoring requirements, and other conditions necessary for compliance with water quality standards.

A permit modification may include a schedule of compliance. Any such permit modification will be conducted in accordance with applicable permit modification procedures, which include development of draft and final permits and associated public

PART C

OTHER REQUIREMENTS

d. Procedures for Granting Extensions of Time to Achieve Water Quality-Based Effluent Limitations

At the request of the Permittee, in conjunction with modifying the permit to incorporate water quality-based effluent limitations under Subsection c. above, the Department may grant an extension of time to achieve the water quality-based effluent limitations shown in Subsection a. above, provided the Permittee meets all of the eligibility requirements contained in Section 95.4 of the Department's Rules and Regulations.

Requests for Section 95.4 time extension, including all documentation required to support such a request, must be submitted to the Department along with the Permittee's TRE as required under Subsection b. above.

e. Procedures for Demonstration of Alternative Site-Specific Bioassay-Based Effluent Limitations

Where the water quality-based effluent limitations listed in this Part C have been developed by the Department for protection of fish and aquatic life, the Permittee may request an opportunity to demonstrate alternative, site-specific, bioassay-based "safe concentration values" for the pollutants in question.

The following water quality-based effluent limitations in this Part C are based on protection of fish and aquatic life:

Aluminum, Cadmium, Lead, Silver, Zinc, Tin, Titanium.

The procedures for carrying out such demonstrations shall be approved in writing by the Department, and shall be conducted in accordance with the requirements of Sections 93.8(d)-(e) of the Department's Rules and Regulations.

Requests for alternative, site-specific, bioassay-based effluent limitations, including all documentation required to support such a request, must be submitted to the Department along with the Permittee's TRE as required under this Part C.

Where the demonstration results in more stringent limitations than those established by the Department in this Part C, the more stringent limitations will apply. Any less stringent limitations which are approved by the Department shall not violate applicable criteria for the protection of human health. This procedure does not apply to those parameters for which specific numeric criteria are listed in Section 93.7, Table 3 of the Department's Rules and Regulations.

PART C

OTHER REQUIREMENTS

H. Analysis for the following pollutant(s) shall be performed using the following test method(s) contained in the EPA publication entitled Methods for Chemical Analysis of Water and Wastes, or any approved test method(s) of equal or greater sensitivity.

Beryllium	EPA Method 210.2 Graphite Furnance A.A.
Cyanide Free	See Suggested DER Method for Determination of Free Cyanide (Draft 5-84)
Chloroform	EPA Method 624 Purge and Trap GC/MS
PCB 1260	EPA Method 608 GC with ECD for Pesticide and PCB
Phenanthrene	EPA Method 610 HPLC with Fluorescence-UV
Cadmium	EPA Method 200.7 ICP
Lead	EPA Method 200.7 ICP
Nickel	EPA Method 200.7 ICP
Silver	EPA Method 272.2 Graphite Furnance A.A.
Tin	EPA Method 282.2 Graphite Furnance A.A.
Titanium	EPA Method 283.2 Graphite Furnance A.A.
Chlorodibromomethane	EPA Method 601 Purge & Trap GC with ECD
Methylene Chloride	EPA Method 601 Purge & Trap GC with ECD
Dichlorobromomethane	EPA Method 601 Purge & Trap GC with ECD

I. Point Sources 002 through 017 and 020 through 037 (listed below) serve as combined sewer reliefs necessitated by stormwater entering the sewer system and exceeding the hydraulic capacity of the sewers and/or the treatment plant and are permitted to discharge only for such reason. There are at this time no specific effluent limitations on these discharges. The regulating chambers shall be maintained in operable condition including regular monitoring and inspection of regulator controls within the combined sewer system and prompt repair or replacement of malfunctioning regulator controls. Results of the inspections (Interceptors Services Report) shall be submitted monthly as part of the Discharge Monitoring Report.

PART C

OTHER REQUIREMENTS

Discharges to Delaware River

Point Source	Interceptor Regulator Name	Location	Latitude ° ' "	Longitude ° ' "
035		Oregon Relief Sewer Oregon Ave. & Delaware River	39°54"44"	75°08'16"
036		Cumberland Street, East of Richmond Street (D-37)	39°58'06"	75°07'17"
037		Delaware Ave. North of Arch St (D-75) Shares Outfall with (D-52)	39°57'08"	75°08'25"
002		Dyott St. & Delaware Ave. (D-38)	39°58'08"	75°07'19"
003		Susquehanna Ave East of Beach St. (D-39)	39°58'07"	75°07'23"
004		Berks St. East of Beach St. (D-40)	39°58'04"	75°07'25"
005		Palmer St. East of Beach St. (D-41)	39°58'04"	75°07'38"
006		Columbia Ave East of Beach St. (D-42)	39°57'58"	75°07'44"
007		Marlborough St. and Delaware Ave. (D-43)	39°57'57"	75°07'49"
008		Shackamaxon St. East of Delaware Ave. (D-44)	39°57'53"	75°07'54"
009		Laurel St. and Delaware Ave. (D-45)	39°57'49"	75°08'01"
010		Penn St. and Delaware Ave. (D-46)	39°57'42"	75°08'12"
011		Fairmount Ave. West of Delaware Ave. (D-47)	39°57'39"	75°08'10"
012		Willow St. West of Delaware Ave. (D-48)	39°57'29"	75°08'17"
013		Callowhill St. and Delaware Ave. (D-49)	39°57'24"	75°08'20"
014		Delaware Ave. North of Vine St. (D-50)	39°57'22"	75°08'13"
015		Race St. West of Delaware Ave. (D-51)	39°57'11"	75°08'18"
016		Delaware Ave. and Arch St. (D-52)	39°57'08"	75°08'25"
017		Market Street and Front Street (D-53)	39°57'01"	75°08'20"
020		Front St. South of Chestnut St. (D-54)	39°56'47"	75°08'29"
021		South Street and Delaware Ave. (D-58)	39°56'27"	75°08'32"
022		Catherine St. East of Swanson St. (D-61)	39°56'12"	75°08'31"
023		Queen St. East of Swanson St. (D-62)	39°56'08"	75°08'31"

PART C

OTHER REQUIREMENTS

Discharges to Delaware River

Point Source	Interceptor Regulator Name	Location	Latitude ° ' "	Longitude ° ' "
024		Christian St. West of Delaware Ave. (D-63)	39°56'03"	75°08'32"
025		Washington Ave. East of Delaware Ave. (D-64)	39°55'54"	75°08'32"
026		Reed St. East of Delaware Ave. (D-65)	39°55'45"	75°08'29"
027		Tasker St. East of Delaware Ave. (D-66)	39°55'36"	75°08'27"
028		Moore St. East of Delaware Ave. (D-67)	39°55'30"	75°08'21"
029		Snyder Ave and Delaware Ave. (D-68)	39°55'12"	75°08'20"
030		Delaware Ave. North of Porter St. (D-69)	39°55'00"	75°08'13"
031		Oregon Ave. and Delaware Ave. (D-70)	39°54'44"	75°08'16"
032		Bigler St. and Delaware Ave. (D-71)	39°54'33"	75°07'59"
033		Pattison Ave. and Swanson St. (D-73)	39°54'24"	75°08'06"
034		Packer Ave. East of Delaware (D-72)	39°54'07"	75°08'07"

J. The following requirements shall apply with regard to implementation of the required industrial pretreatment program.

(a) The permittee shall operate an industrial pretreatment program in accordance with Section 402(b)(8) of the Clean Water Act and the General Pretreatment Regulations (40 CFR Part 403). The program shall also be implemented in accordance with the approved POTW pretreatment program submitted by the permittee.

(b) The permittee shall submit to EPA and DER an annual report that describes the permittee's program activities over the previous 12 months. The permittee must also report on the pretreatment program activities of all participating agencies, if more than one jurisdiction is involved in the local program.

(c) The report shall be incorporated into and submitted with the permittee's annual Municipal Wasteload Management report required by DER's Chapter 94 Rules and Regulations. The report shall include the following:

PART C

OTHER REQUIREMENTS

1) Compliance with Categorical and Local Standards - A summary of the compliance status for those industries affected by final Categorical Pretreatment Standards.

2) Review of Industrial Compliance - Information on the number and type of major violations of pretreatment regulations, and the actions taken or planned by the POTW to obtain compliance.

3) Summary of Industrial User Inspections - A summary of the number and type of industrial user inspections by the POTW.

4) Summary of POTW Operations - Any interference, upset, or permit violations experienced at the POTW directly attributable to industrial users, and actions taken to alleviate said events. Sampling and analysis of POTW influent, effluent, and sludge for toxic and incompatible pollutants shall also be included.

5) Pretreatment Program Changes - A description of any significant changes in operating the program from the original submission, including staffing and funding. An updated industrial survey shall be included, as appropriate.

6) Other Miscellaneous Pretreatment Developments - POTW facility changes, problems or improvements regarding sludge, water quality, data management, or any special concerns.

(d) EPA and DER retain the right to require the POTW to institute changes to its local pretreatment program:

1) If the program is not implemented in a way satisfying the requirements of 40 CFR 403;

2) If problems such as interference, pass through, or sludge contamination develop or continue;

3) If other Federal, State or local requirements (i.e., water quality standards) change.

K. The permittee shall operate the sewage treatment plant to provide treatment for the maximum design wastewater flows of 168 MGD (maximum daily average) and 224 MGD (peak) without causing treatment process upsets. Throttling of influent flows to the Plant resulting in avoidable, premature sewer system overflows is prohibited.

L. An average monthly flow in excess of 112 MGD shall not be considered to be a violation of this permit.

PART C

OTHER REQUIREMENTS

M. The mass limitation for BOD_5 shall not become effective until January 1, 1989. During the period January 1, 1987 through December 31, 1987 influent data (without impact of recycle streams) and effluent data shall be collected relative to BOD_5 (uninhibited) on a daily basis and First Stage Oxygen Demand (FSOD) on a twice per week basis. This data base will be used to determine whether the existing FSOD allocation, the equivalent BOD_5 mass effluent limitation and/or the current $FSOD/BOD_5$ ratio should be revised. Progress reports shall be submitted to the Delaware River Basin Commission and the Department by April 30, 1987 and September 30, 1987. A final report shall be submitted to the same agencies on or before March 31, 1988.

N. An excursion of the lower pH limitation in the effluent resulting from the use of the Oxygen Activated Sludge process shall not be considered a violation of this permit, so long as the excursion frequency does not exceed 2.0% of the time on an annual basis and the pH is not less than 5.5 standard units.

(2NPDW5).4/.4.8

Additional Instructions for Utilizing

The

National Pollutant Discharge Elimination System

DISCHARGE MONITORING REPORT

The attached originals of the NPDES Discharge Monitoring Report have been provided to you as a master. The permit establishes specific effluent monitoring and reporting requirements and these values are repeated on the original Discharge Monitoring Report provided for you. The 'N/A' placed in the permit condition block of the Discharge Monitoring Report indicates one of two things: (1) that the parameter is monitored but no limitations are imposed, and the pertinent values must be reported; or (2) that the parameter is limited elsewhere on the Discharge Monitoring Report, and the value should be reported if it is available.

Your reports are to be submitted by utilizing copies of the attached forms. Do not write on or send the attached originals, but rather: (1) make copies of them, (2) fill out the copies as appropriate, (3) make the necessary copies of the completed (filled out) form, and (4) submit these copies to the appropriate EPA and State Offices as provided in the permit.

ATTACHMENTS

ER–BWQ–15.2: Rev. 8/87

DRAFT

JUL. 2 2 1992

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF WATER QUALITY MANAGEMENT

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM SEWAGE PERMIT NO. PA 0026662

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 et seq. (the "Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 et seq.,

City of Philadelphia Water Department

is hereby authorized to discharge from The Southeast Water Pollution Control Plant (Point Source 001) and 35 overflow points (Point Sources 002-017 and 020-038) located in the City of Philadelphia, Philadelphia County

to the receiving waters named Delaware River Zone 3 (Point Sources 001-017 and 020-037) and Schuylkill River (Point Source 038).

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B, and C hereof.

This permit and the authorization to discharge shall expire at midnight _____.

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the standard or special conditions, and the terms and conditions of this permit, the terms and conditions shall apply.

2. Failure to comply with any of the terms or conditions of this permit is grounds for enforcement action; for permit termination, revocation and reissuance or modification; or for denial of a permit renewal application.

3. It is required by law that this permit, before becoming operative, shall be recorded in the Office of the Recorder of Deeds for the county wherein the outlet of said sewer system is located.

4. Application for renewal of this permit, or notification of intent to cease discharging by the expiration date, must be submitted to the Department at least 180 days prior to the above expiration date (unless permission has been granted by the Department for submission at a later date), using the appropriate NPDES Permit Application Form. In the event that a timely and complete application for renewal has been submitted and the Department is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit will be automatically continued and will remain fully effective and enforceable pending the grant or denial of the application for permit renewal.

5. This permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

PERMIT ISSUED

DATE _____

BY _____

TITLE Joseph A. Feola
Regional Water Quality Manager

DRAFT

JUL 22 1992

PART A

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001; LOCATED AT LATITUDE 39°54'24", LONGITUDE 75°08'07"

A. The Permittee is authorized to discharge during the period from issuance through expiration.
B. The average monthly flow of effluent discharged from the wastewater treatment facility shall not exceed 112 million gallons per day.
C. The quality of effluent shall be limited at all times as specified in Footnote (3) and as follows:

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)		CONCENTRATIONS (mg/l)				INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY				
FLOW (a)								Continuous	Recorded	
BOD_5 (b)	19,650	29,475		30	45		60	Daily	24 HC	
BOD_5 % REMOVAL (f)	DRBC Zone 3 Requirement of 86%							Daily	24 HC	
SUSPENDED SOLIDS	28,025	42,035		30	45		60	Daily	24 HC	
$CBOD_{20}$ (c)	33,600							Daily	24 HC	
FECAL COLIFORM (5-1 to 9-30)			SEE FOOTNOTE (2)					Daily	Grab	
FECAL COLIFORM (10-1 to 4-30)			SAME LIMITS AS IN FOOTNOTE (2)					Daily	Grab	
pH (d)	WITHIN LIMITS OF 6 TO 9 STANDARD UNITS AT ALL TIMES							Daily	Grab	
NH_3-N				MONITOR ONLY	MONITOR ONLY			1/Week	24 HC	
TKN				MONITOR ONLY	MONITOR ONLY			1/Week	24 HC	

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DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)		CONCENTRATIONS (mg/l)				INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY				
NO_2-N				Monitor Only	Monitor Only			1/Week	24 HC	
NO_3-N				Monitor Only	Monitor Only			1/Week	24 HC	
ALUMINUM, TOTAL (e)				Monitor Only				1/Month	24 HC	
CADMIUM, TOTAL (e)				Monitor Only				1/Month	24 HC	
CHROMIUM, TOTAL (e)				Monitor Only				1/Month	24 HC	
CHROMIUM, HEXAVALENT (e)				Monitor Only				1/Month	Grab	
IRON, TOTAL (e)				Monitor Only				1/Month	24 HC	
MANGANESE (e)				Monitor Only				1/Month	24 HC	
SILVER (e)				Monitor Only				1/Month	24 HC	
TIN (e)				Monitor Only				1/Month	24 HC	

CONTINUED ON PAGE 2b

CONTINUED FROM PAGE 2a

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS			
	MASS UNITS (lbs/day)		CONCENTRATIONS (mg/l)				INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY				
TITANIUM (e)				Monitor Only				1/Month	24 HC	
ZINC (e)				Monitor Only				1/Month	24 HC	
CYANIDE, FREE (e)				Monitor Only				1/Month	24 HC	
CHLOROFORM (e)				Monitor Only				1/Month	Grab	
CHLORODIBROMOMETHANE (e)				Monitor Only				1/Month	Grab	
DICHLOROBROMOMETHANE (e)				Monitor Only				1/Month	Grab	
METHYLENE CHLORIDE (e)				Monitor Only				1/Month	Grab	
TETRACHLOROETHYLENE (e)				Monitor Only				1/Month	Grab	
TOTAL RESIDUAL CHLORINE				Monitor Only				Daily	Grab	

(a) See Paragraph O, Other Requirements (Page 14k of 14)
(b) See paragraph P, Other Requirements (Page 14k of 14)
(c) $CBOD_{20}$ - 20-Day Carbonaceous Biochemical Oxygen Demand Test With Nitrogenous Oxygen Demand Inhibited
(d) See Paragraph S, Other Requirements (Page 14r of 14)
(e) See Paragraph H, Other Requirements (Page 14a of 14)
(f) See Paragraph G, Other Requirements (Page 14 of 14)

FOOTNOTES: 1. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): at Outfall 001 at the Pier Effluent Sampling Building.

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I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001; LOCATED AT LATITUDE 39°54'24", LONGITUDE 75°08'07"

A. During the period beginning at issuance and lasting through expiration, the Permittee is authorized to discharge.

B. Based on production data and anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply:

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)		TUc ****					
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	MAXIMUM DAILY	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
WHOLE EFFLUENT TOXICITY - CERIODAPHNIA DUBIA *&**					MONITOR ONLY	QUARTERLY	24 H.C.	
WHOLE EFFLUENT TOXICITY - FATHEAD MINNOW * & ***					MONITOR ONLY	QUARTERLY	24 H.C.	

FOOTNOTES: 1. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfall 001 at the Pier Effluent Sampling Building.

* See Paragraph Q, Other Requirements (Page 141 of 14)

** Toxicity monitoirng based on static renewal chronic Ceriodaphnia dubia test reported as a maximum daily result.

*** Toxicity monitoring based on static renewal chronic Fathead minnow test reported as a maximum daily result.

**** TUc: Chronic Toxicity Units $TUc = \frac{100}{NOEC}$

PART C

OTHER REQUIREMENTS

A. Effluent limitations, monitoring requirements, and other standard and special conditions which relate to the discharge(s) of pollutants authorized by this permit and which are contained in Water Quality Management Permit(s)

No. 9209S and 5173402 issued on February 25, 1959 and October 19, 1973

are superseded by the terms and conditions of this permit, unless specifically noted otherwise herein.

B. A copy of the Discharge Monitoring Report is to be sent to the following agencies:

Delaware River Basin Commission
P.O. Box 7360
West Trenton, New Jersey 08628

PA Enforcement Branch (3WM51)
U.S. Environmental Protection Agency
841 Chestnut Building
Philadelphia, PA 19107

C. For reporting purposes on the Discharge Monitoring Report, the term "average weekly" shall mean the highest average weekly value observed during the monthly monitoring period.

D. If, in the opinion of the Department, the sewage treatment plant is not so operated or if by reason of change in the character of the waste or increased load upon the sewage treatment plant, or changed use or condition of the receiving body of water, or otherwise, that the effluent ceases to be satisfactory or the sewage treatment plant creates a public nuisance, then upon notice by the Department the right herein granted to discharge such effluent shall cease and become null and void unless within the time specified by the Department, the permittee shall adopt such remedial measures as will produce an effluent which, in the opinion of the Department, will be satisfactory for discharge into the receiving body of water.

E. No storm water from pavements, area ways, roofs, foundation drains or other sources shall be admitted to the sanitary sewers associated with the herein approved discharge.

F. The approval herein given is specifically made contingent upon the permittee acquiring all necessary property rights by easement or otherwise, providing for the satisfactory construction, operation, maintenance and replacement of all sewers or sewerage structures associated with the herein approved discharge in, along, or across private property, with full rights of ingress, egress and regress.

G. The BOD_5 in the raw wastewater shall be reduced by at least 86% as a monthly average in accordance with the requirements of the Delaware River Basin Commission for Zone 3 of the Delaware Estuary. The percent removal shall be calculated from daily 24 hour composite samples of the influent and effluent.

PART C

OTHER REQUIREMENTS

The influent samples must reflect the true characteristics of the raw wastewater and must not be affected by plant recycle flows. If equivalent $CBOD_5$ effluent limits replace the BOD_5 effluent limits, the percent removal shall be calculated using influent and effluent $CBOD_5$ measurements.

H. Analysis for the following pollutant(s) shall be performed using the following test method(s) contained in 40 CFR Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants, or any approved test method(s) of equal or greater sensitivity.

Parameter	Test Method
Aluminum, Total	EPA Method 210.1 (AA, Flame)
Cadmium, Total	EPA Method 213.2 (AA, Furnace)
Chromium, Total	EPA Method 218.1 (AA, Flame)
Chromium, Hexavalent	EPA Method 218.4 (AA, Extraction)
Iron, Total	EPA Method 236.1 (AA, Direct)
Manganese	EPA Method 242.1 (AA, Flame)
Silver	EPA Method 272.2 (AA, Furnace)
Tin	EPA Method 282.2 (AA, Furnace)
Titanium	EPA Method 283.2 (AA, Furnace)
Zinc	EPA Method 289.1 (AA, Flame)
Cyanide, Free	DER Method (See Attached)
Chloroform	EPA Method 624 (GC/MS)
Chlorodibromomethane	EPA Method 601 (GC/HAL.)
Dichlorobromomethane	EPA Method 601 (GC/HAL.)
Methylene Chloride	EPA Method 624 (GC/MS)
Tetrachloroethylene	EPA Method 601 (GC/MS)

I. The following requirements shall apply with regard to implementation of the required industrial pretreatment program:

(1) The permittee shall operate an industrial pretreatment program in accordance with the Clean Water Act and the General Pretreatment Regulations (40 C.F.R. 403). The program shall also be implemented in accordance with the approved and/or modified POTW pretreatment program submitted by the permittee.

(2) The permittee shall submit all changes, and obtain approval of all substantial changes, in its approved pretreatment program in accordance with 40 C.F.R. 403.18.

OTHER REQUIREMENTS

(3) The permittee's implementation of its pretreatment program shall, at a minimum, meet the requirements listed below. Where the approved program requires more stringent or more frequent activity, the requirements of the approved program shall apply.

(a) The permittee shall provide written notice of applicable pretreatment requirements to all industrial users. For significant industrial users (SIUs) such written notice shall be through individual discharge permits or other equivalent control mechanism in accordance with 40 C.F.R. 403.8(f). All SIU control mechanisms shall be in place within 6 months of program approval and shall not be issued for a period which exceeds 5 years. SIU control mechanisms shall be reissued within 3 months of expiration, and administrative extensions shall not be granted without written consent from the Approval Authority.

(b) Each SIU shall be sampled by the permittee at least once per year. Such sampling shall include all regulated parameters.

(c) Each SIU shall be inspected by the permittee at least once per year. Such inspection shall cover all areas which could result in wastewater discharge to the sewer including manufacturing areas, chemical storage areas, pretreatment facilities, spill prevention and control procedures, hazardous waste generation, and industrial self-monitoring procedures and records.

(d) The permittee shall implement the industrial reporting requirements of 40 C.F.R. 403.12.

(e) The permittee shall develop and obtain Approval Authority approval of a written enforcement response plan (ERP) within 6 months of permit issuance. The ERP shall indicate how instances of violation will be investigated, what enforcement options are available to the POTW, contain a listing of potential industrial violations, and state the type of action and timeframe for the permittee's enforcement for each violation. Where approval of the ERP has been previously granted, the permittee shall reevaluate its ERP and submit the results of the reevaluation and a revised ERP within 6 months of permit issuance.

(f) The permittee shall take timely and appropriate enforcement in accordance with its approved ERP for all instances of industrial violations.

PART C

OTHER REQUIREMENTS

(g) The permittee shall submit, to the Approval Authority, a reevaluation of its local limits based on a headworks analysis of its treatment plant within 1 year of permit issuance. At a minimum, the headworks analysis shall include arsenic, cadmium, chromium, copper, cyanide (T) lead, mercury, nickel, silver, zinc, any parameter limited by this permit or sludge disposal requirements, and any other pollutant which the permittee or approval authority believes may be discharged by its industries in amounts which may cause pass-through or interference. The list of pollutants to be evaluated shall be submitted within 3 months of permit issuance.

(h) The permittee shall conduct monitoring at its treatment plant based on its permitted flows, as follows:

i) > 20 MGD - monthly influent, effluent and sludge analysis for all local limit parameters, semi-annual priority pollutant scan for influent and sludge.

ii) > 5-20 MGD - monthly influent, effluent and sludge analysis for all local limit parameters, annual priority pollutant scan for influent and sludge.

iii) > 1-5 MGD - quarterly influent, effluent and sludge analysis for all local limit parameters, annual priority pollutant scan for influent and sludge.

iv) < 1 MGD - annual influent, effluent and sludge analysis for all local limit parameters, priority pollutant scan for influent and sludge within 1 year.

(i) The permittee shall ensure that adequate resources are available (equipment and personnel) to fully implement the pretreatment program.

(4) EPA and DER retain the right to require the permittee to institute changes to its pretreatment program if:

(a) the program is not implemented in a way satisfying the requirements of 40 C.F.R. 403;

(b) problems such as interference, pass-through or sludge contamination develop or continue;

(c) Federal, State, or local requirements change.

PART C

OTHER REQUIREMENTS

(5) By March 31 of each year, the permittee shall submit to EPA and DER an annual report that describes the permittee's pretreatment activities for the previous calendar year. The annual report shall include pretreatment activities in all municipalities from which wastewater is received at the permittee's treatment plant. The submission to DER shall be incorporated into the permittee's annual Municipal Wasteload Management report required by DER's Chapter 94 Rules and Regulations. The annual report shall include the following:

(a) Control Mechanism Issuance - a summary of SIU control mechanism issuance including a list of issuance and expiration dates of each SIU.

(b) Sampling and Inspection - a summary of the number and type of inspections and samplings of SIUs by the permittee, including a list of all SIUs either not sampled or not inspected.

(c) Industrial User CoListing and POTW Enforcement - a summary of the number and type of violations of pretreatment regulations and the actions taken by the permittee to obtain compliance. For each SIU, the report shall say whether the user was in significant noncompliance under 40 C.F.R. 403.8, infrequent (non-significant) noncompliance, or in compliance for the entire year. A copy of the published list of facilities in significant noncompliance shall be included.

(d) Industrial Listing - an updated industrial listing showing all current SIUs and the catergorical standard, if any, applicable to each.

(e) Summary of POTW Operations - any interference upset, or permit violations experienced at the POTW which may be attributed to industrial users, and actions taken to alleviate said events. Sampling and analysis of treatment plant influent and sludge for toxic and incompatible pollutants shall also be included with an analysis of any trends in the data since pretreatment program approval.

(f) Pretreatment Program Changes - a summary of any changes to the approved program and the date of submission to the Approval Authority.

OTHER REQUIREMENTS

J. The permittee will ensure that applied chlorine dosages, used for disinfection or other purposes, are optimized to the degree necessary such that the total residual chlorine (TRC) in the discharge effluent does not cause an adverse stream impact. In doing so, the permittee shall consider relevant factors affecting required chlorine dosage, such as wastewater characteristics, mixing and contact times, desired result of chlorination, and expected impact on the receiving water body. The TRC data shall be recorded daily and maintained at the facility. For municipal facilities the data shall be summarized annually as part of the Chapter 94 - Municipal Wasteload Management Report.

If the Department determines or receives documented evidence that levels of TRC in the permittee's effluent are causing adverse water quality impacts in the receiving water, the permittee shall be required to institute necessary additional steps to reduce or eliminate such impact.

K. Collected screenings, slurries, sludges, and other solids shall be handled and disposed of in compliance with 25 Pa. Code, Chapters 271, 273, 275, 283,and 285 (relating to permits and requirements for landfilling, land application, incineration, and storage of sewage sludge), Federal Regulation 40 CFR 257, and the Federal Clean Water Act and its amendments.

L. The Department may identify and require certain discharge specific data to be submitted before the expiration date of this permit. Upon notification by the Department, the permittee will have 12 months from the date of the notice to provide the required data. These data, along with any other data available to the Department, will be used in completing the Watershed TMDL/WLA Analysis and in establishing discharge effluent limits.

M. Combined Sewer Overflow

Point Sources 002 through 038 (listed below) serve as combined sewer reliefs necessitated by stormwater entering the sewer system and exceeding the hydraulic capacity of the sewers and/or treatment plant. Combined sewer overflows (CSO) are allowed only when flows in combined sewers exceed conveyance or treatment capacities during wet weather periods. Dry weather overflows are prohibited. CSOs are point source discharges which must be provided technology-based control measures in accordance with the Clean Water Act. Additional control measures will also have to be provided if determined necessary to comply with water quality standards. At a minimum, technology-based control measures must include best management practices and/or other non-capital intensive measures to minimize discharges and water quality impacts.

OTHER REQUIREMENTS

Discharges to Delaware River

Point Source	Interceptor Regulator Name	Latitude	Longitude
035	Oregon Relief Sewer Oregon Ave. & Delaware River	39°54'44"	75°08'16"
036	Cuberland Street, East of Richmond Street (D-37)	39°58'06"	75°07'17"
037	Delaware Ave. North of Arch St (D-75) Shares Outfall with (D-52)	39°57'08"	75°08'25"
002	Dyott St. & Delaware Ave. (D-38)	39°58'08"	75°07'19"
003	Susquehanna Ave. East of Beach St. (D-39)	39°58'07"	75°07'23"
004	Berks St. East of Beach St. (D-40)	39°58'04"	75°07'25"
005	Palmer St. East of Beach St. (D-41)	39°58'04"	75°07'38"
006	Columbia Ave. East of Beach St. (D-42)	39°57'58"	75°07'44"
007	Marlborough St. and Delaware Ave. (D-43)	39°57'57"	75°07'49"
008	Shackamaxon St. East of Delaware Ave. (D-44)	39°57'53"	75°07'54"
009	Laurel St. and Delaware Ave. (D-45)	39°57'49"	75°08'01"
010	Penn St. and Delaware Ave. (D-46)	39°57'42"	75°08'12"
011	Fairmount Ave. West of Delaware Ave. (D-47)	39°57'39"	75°08'10"
012	Willow St. West of Delaware Ave. (D-48)	39°57'29"	75°08'17"
013	Callowhill St. and Delwaware Ave. (D-49)	39°57'24"	75°08'20"
014	Delaware Ave. North of Vine St. (D-50)	39°57'22"	75°08'13"
015	Race St. West of Delaware Ave. (D-51)	39°57'11"	75°08'18"
016	Delaware Ave. and Arch St. (D-52)	39°57'08"	75°08'25"
017	Market Street and Front Street (D-53)	39°57'01"	75°08'20"
020	Front St. South of Chestnut St. (D-54)	39°56'47"	75°08'29"
021	South Street and Delaware Ave. (D-58)	39°56'27"	75°08'32"

OTHER REQUIREMENTS

022	Catherine St. East of Swanson St. (D-61)	39°56'12"	75°08'31"
023	Queen St. East of Swanson St. (D-62)	39°56'08"	75°08'31"
024	Christian St. West of Delaware Ave. (D-63)	39°56'03"	75°08'32"
025	Wasington Ave. East of Delaware Ave. (D-64)	39°55'54"	75°08'32"
026	Reed St. East of Delaware Ave. (D-65)	39°55'45"	75°08'29"
027	Tasker St. East of Delaware Ave. (D-66)	39°55'36"	75°08'27"
028	Moore St. East of Delaware Ave. (D-67)	39°55'30"	75°08'21"
029	Snyder Ave. and Delaware Ave. (D-68)	39°55'12"	75°08'20"
030	Delaware Ave. North of Porter St. (D-69)	39°55'00"	75°08'13"
031	Oregon Ave. and Delaware Ave. (D-70)	39°54'44"	75°08'16"
032	Bigler St. and Delaware Ave. (D-71)	39°54'33"	75°07'59"
033	Pattison Ave. and Swanson St. (D-73)	39°54'24"	75°08'06"
034	Packer Ave. East of Delaware (D-72)	39°54'07"	75°08'07"

Discharge to Schuylkill River

D38	Stokley St. and Roberts Ave. (R-22)	40°01'12"	75°11'30"

1. MINIMUM TECHNOLOGY-BASED CONTROL MEASURES - PLAN OF ACTION

The permittee shall complete and implement a Minimum Technology-based Plan of Action for identification and minimization of all CSO discharges according to the following schedule:

Permit Issuance Date (PID)

Description of Activity	Due Date (actual dates to be entered at issuance)
Submit a conceptual plan to state and EPA, Region III, (3WM53)	PID + 4 months
State approval/modification of conceptual plan	PID + 6 months
Submittal of final plan to State and EPA, Region III including implementation plan and schedule	PID + 12 months

PART C

OTHER REQUIREMENTS

Completion of Plan recommendations final report to State and EPA, Region III — PID + 38 months

The Minimum Technology-based Limitation Plan of Action shall address at a minimum, the following measures:

a. Identification of Combined Sewer Overflows. Review and update the CSO discharge points listed in Part A of this permit. For each CSO indicate the following measures:

i. latitude and longitude of the CSO discharge point and associated regulator mechanism.

ii. A narrative description of the location of the CSO point and regulator mechanism with respect to direction and distance from street intersections.

iii. A location map (U.S.G.S. Topographic Quadrangle) with the location of the CSO point and associated regulator mechanism indicated.

iv. A description of the size and type of regulator mechanism, including engineering drawing.

v. A description of the size and type of outfall structure.

vi. A determination of whether the outfall structure is submerged, partially submerged or not submerged during times of critical condition by the receiving water.

vii. Verification of the presence or absence of a backflow prevention device on the CSO.

viii. Name of the receiving water.

ix. Development of a visual identification system on all CSO outfalls, by visually labeling the outfall pipe with a numbering system, submerged outfalls shall be identified at the nearest manhole/bulkhead.

x. Identification of CSOs near drinking water intakes, recreation areas, or unique ecological habitats.

xi. Identification of any continuous or chronic dry weather overflows.

PART C

OTHER REQUIREMENTS

b. System Inventory

The plan shall identify all overflow points, control structures, sewer sizes and control structure dimensions, industrial contributors and key hydraulic monitoring control points. The inventory shall include system maps, hydraulic analyses and flow measurements. Characterization of all overflows in terms of both frequency, quantity and quality; identification of the intensity and duration of the storm event that triggers an overflow.

Volume discharge from each overflow for various size storms, and number of events and total volume discharged per year based on historical rainfall records.

c. Operational Status and Assessment

Summarize the current operation status, control measures, and functional adequacy of all CSOs. A comprehensive engineering assessment of the operational status and condition of all portions of the CSO treatment works based on actual field verification/inspection records shall be included. Information on the determination of whether the sewers are cracked, depressed, or of questionable physical integrity, observances of the presence of flow restrictions due to excessive sludge or grease build-up, or other conditions, and an assessment of each regulator's and/or tide gate's operability and reliability. All dry weather overflows are prohibited.

Based upon the results of the engineering inspection and assessment, the report shall include a prioritized list, strategy and schedule for rehabilitating the system and bringing it into optimal operating condition. A prioritized list for correction of any continuous dry weather overflows with schedule shall also be included.

d. Inspection and Maintenance

Summarize the regular inspection and maintenance of the combined sewer system including regulators to ensure that (1) deposition of solids does not cause obstructions which result in overflows; (2) continuous dry weather discharges are not occurring, and (3) regulators are in good working order and adjusted to minimize overflows. Identify response time between initial dry weather CSO discharge and corrective action; include a plan to reduce response time. The permittee shall submit as part of the plan of action, a written Operation and Maintenance (O&M) Plan designed to ensure the above items.

OTHER REQUIREMENTS

e. High Flow Management

Development of a high flow management plan which (1) maximizes the capacity of the combined sewer system for storage without causing backup or surcharge problems, and (2) enables a maximum amount of flow to be conveyed to the treatment plant without upsetting normal plant operations. Measures to be evaluated should include raising existing overflow weir levels and possible utilization of primary settling facilities for treatment if sufficient excess capacity is available, and automatic regulator and computerized control system.

f. Ordinance Revisions

Modification of the sewer ordinance where necessary to ensure prohibitions of (1) dry weather overflows, (2) construction of new combined sewers, except where sewer separation is infeasible (3) inflow sources in sanitary sewer tributary to the combined system, and (4) dumping of motor oil and excessive grease into the sewer system.

g. Source Reduction

Minimization of discharges of solids and floating materials by (1) regular cleaning of streets and catch basins, (2) installation of screens on CSOs, particularly those discharging to estuary waters, (3) reduction of infiltration/inflow where feasible.

h. Pretreatment Program

Review impact of Industrial Users toxics, BOD, and total suspended solids load to CSO overflows; review and modify pretreatment programs to assure CSO impacts are minimized.

i. Minimization of CSOs near sensitive areas

Examine elimination or minimization of CSO discharges near drinking water intakes, recreation areas, or unique ecological habitats.

2. WATER QUALITY IMPACTS - PLAN OF ACTION

A water quality impact plan of action for CSOs shall be based upon the results of the Delaware River Basin Commission (DRBC) CSO Comprehensive Study of the Delaware Estuary, currently underway. The permittee shall provide any monitoring data or other information requested by DRBC for the study.

The permittee shall submit a plan of action which sets forth an implementation plan and schedule to address the conclusions and recommendations of the DRBC study within 12 months after DRBC study completion.

PART C

OTHER REQUIREMENTS

If the DRBC study is not completed in a timely manner, the permittee will be required to conduct a CSO water quality impact study. Additional guidance and schedule will be provided by the Department.

3. REPORTING REQUIREMENTS

The permittee shall submit semi-annual (January 1, July 1) status reports to the Department and EPA, Region III (3WM53) on the development of the Minimum Technology-based control measures plan of action, implementation of the Minimum Technology-based control measures Plan, and development of the water quality plan.

Each priority CSO overflow point, as identified by an asterisk on the CSOs listed above, shall be monitored for cause, frequency, duration and quantity of flow. All monitoring data shall be recorded and submitted monthly in the format specified by the Department (attached) and shall be summarized annually with the facility's Chapter 94 Wasteload Management Report.

Annual CSO Status Report

The annual CSO status report shall be submitted with the Chapter 94 - "Municipal Wasteload Management Report". The report shall provide a summary of the frequency, duration, and volume of the CSOS for the past calendar year, operational status of major overflow points and identification of known/potential instream water quality impacts and their causes. The annual report shall also summarize all actions taken and their effectiveness in implementing the approved Plans of action, and shall evaluate and provide necessary revisions to the plans approved by the Department.

N. The permittee shall operate the sewage treatment plant to provide treatment for the maximum design wastewater flows of 168 MGD (Maximum Daily Average) and 224 MGD (Peak) without causing treatment process upsets. Throttling of influent flows to the plant resulting in avoidable, premature sewer system overflows is prohibited.

O. An average monthly flow in excess 112 MGD shall not be considered to be a violation of this permit.

P. An application may be made to the Delaware River Basin Commission to establish alternate/equivalent $CBOD_5$ effluent mass and concentration limits to replace the BOD_5 effluent limits in this permit. Upon establishment of such limits by the commission, the BOD_5 limits shall cease to be in effect and the $CBOD_5$ limits established by the commission shall become effective.

Q. Biomonitoring

OTHER REQUIREMENTS

I. General Requirements.

The permittee shall conduct acceptable toxicity tests in accordance with the appropriate test protocols described in Section V. Test Conditions and Methods. The permittee must collect discharge samples and perform the toxicity tests to generate chronic Ceriodaphnia dubia and fathead minnow (Pimephales promelas) test results (NOEC's) which will also enable a determination of the acute (LC50) value at the 48 hour interval. For purpose of reporting, all NOEC's shall be converted to TUc's by the following equation:

$$TUc = \frac{100}{NOEC}$$

In addition all LC50 values shall be converted to Tua's by following equation:

$$TUa = \frac{100}{LC50}$$

Within sixty (60) days of the effective date of the NPDES permit, the permittee shall submit to the Department of Environmental Resources (DER) and the Environmental Protection Agency (EPA), Region III an acceptable plan of study for determining the chronic toxicity of wastewater discharged from outfall(s) 001 through the use of whole effluent toxicity testing (biomonitoring). If DER and EPA comment on the plan, the permittee shall make any modifications requested. If the Department and EPA do not comment on the plan within thirty (30) days of submission, the permittee shall begin the whole effluent toxicity testing program as outlined in the study plan.

At a minimum the study plan should include a discussion of:

--wastewater and production variability

--source of test organisms

--source of dilution water

--test conditions

--sampling methods

--quality assurance/quality control information (including reference toxicity results and any deviations from recommended procedures).

II. Test Frequency.

Static renewal chronic testing shall be conducted on a quarterly basis (four times per year) beginning within thirty (30) days of submission of the biomonitoring study plan, provided that the Department and EPA do not comment on the plan and request modifications within the thirty (30) day period.

PART C

OTHER REQUIREMENTS

Two species shall be tested, the cladoceran Ceriodaphnia dubia for survival and reproduction and the fathead minnow Pimephales promelas for survival and growth. The two species must be tested each quarter, for a total of eight tests. Additional test species may be included, based on effluent characteristics, or as methods are developed.

III. Sample Collection.

For each sampling event, three, twenty-four (24) hour discharge composite samples collected at a frequency of not greater than every two hours and flow proportioned shall be collected over a seven (7) day exposure period. The initial sample taken on day 0 is used to start the test on day 1. The additional two samples are collected on day 2 and 4 to be used on day 3 and 5, respectively. Renewal of test concentrations is conducted daily with the most recently collected discharge sample.

For effluents that are chlorinated, test shall be conducted on a final effluent sample that has been dechlorinated. Dechlorinated samples will consist of the final effluent composites treated with sodium thiosulfate (see Section 7.4 of Weber, C.I, etal (ed). 1989. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms).

All samples held overnight shall be refrigerated at 4°C.

IV. Dilution Water.

The dilution water source must consist of either moderately hard synthetic water (using either Millipore Milli-QR or equivalent deionized water and reagent grade chemicals) or deionized water (80%) combined with Perrier or chemically equivalent mineral water (20%).

V. Test Conditions and Methods.

The test conditions and methods shall conform to those developed by EPA as specified in the documents cited below. If DER or EPA determine that the proper test conditions have not been followed or if the test acceptability criteria are not met, the permittee must perform a re-test within thirty (30) days.

Weber, C.I. et al. (ed.). 1989. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water To Freshwater Organisms. Second Edition. Office of Research and Development, Cincinnati, OH. EPA/600/4-89/001.

Weber, C.I. (ed) 1991. Methods for Measuring the Acute Toxicity of Effluents and receiving water to Freshwater and Marine Organisms, Fourth Edition. Office of Research and Development, Cincinnati, OH. EPA/600/4-90/027.

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U.S. Environmental Protection Agency. 1991. Technical Support Document for Water Quality-based Toxics Control. Office of Water, Washington, DC EPA/505/2-90-001.

A. Summary of effluent toxicity test conditions and test acceptability criteria for the Ceriodaphnia dubia survival and reproduction test (adapted from EPA/600/4-89/001).

1. Renewal of test solutions:	Daily using most recently collected sample.
2. Effluent concentrations:	5 concentrations and a control. An additional control (0% effluent) treated with the same concentration of sodium thiosulfate as used to dechlorinate the effluent sample will be run. If the initial sample has no chlorine present, start the additional control with no sodium thiosulfate.
3. Dilution factor:	0.5
4. Test duration:	Until 60% of control animals have three broods (7 days or less)
5. Sampling Requirements:	A minimum of three samples are collected to be used on days 1, 3, and 5 for renewal. Test samples must be first used within 36 hours of collection.
6. Sample volume required:	Minimum of 1 liter per day
7. Test acceptability criterion:	80% or greater survival and an average of 15 or more young per surviving animal in the control solutions. At least 60% of the surviving animals in controls must have produced their third brood in seven days or less.

B. Summary of effluent toxicity test conditions and test acceptability criteria for the fathead minnow (Pimephales promelas) survival and reproduction test (adapted from EPA/600/4-89/001).

1. Test chamber size:	250-1000 ml
2. Test solution volume:	200 ml/replicate (minimum)
3. No. of larvae per test chamber:	10

OTHER REQUIREMENTS

4. No. of replicate test chambers per concentration: 4

5. No. of larvae per test concentration: 40

6. Feeding regime: Feed 0.1 ml newly hatched brine shrimp nauplii (less than 24 hours old) twice daily at 6 hour intervals (at the beginning of the work day prior to renewal, and at the end of the work day following renewal). Sufficient nauplii are added to provide an excess. Larvae are not fed during the final 12 hours of the test.

7. Effluent concentrations, Dilution series, Sampling requirements, and Renewal of test solution: Same as Section V. Test Conditions and Methods Par A, summary of effluent toxicity test conditions and test acceptability criteria for the Ceriodaphnia dubia survival and reporduction test.

8. Sample volume required: Minimum of 2.5 Liters per day.

VI. Chemicals Analyses.

Chemical analysis shall be performed for each sampling and testing events as described below.

A. The following chemical analysis shall be performed for each sampling event, including each new batch of dilution water:

Parameter	Effluent	Diluent	Detection Limit (mg/L)
Hardness	X	X	0.5
Alkalinity	X	X	2.0
pH	X	X	-
Specific conductance	X	X	-
Total Residual Chlorine	X		0.02

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OTHER REQUIREMENTS

B. The following chemical analyses shall be performed as part of each daily renewal procedure on each dilution and the controls.

Parameter	Effluent	Diluent
Dissolved oxygen	X	X
Temperature	X	X
pH	X	X
Specific Conductance	X	X

In addition to the chemical analysis required above, those parameters listed in Part A of the NPDES permit for the outfall(s) 001 tested will be analyzed on at least the initial (day 0) sample by using the method specified in the NPDES permit or, if not specified, by EPA and DER (Chapter 16, Water Quality Toxics Management Strategy) approved methods.

VII. Toxicity Test Report Elements.

The following must be reported:

-- description of sample collection procedures and of the sample location.

-- names of individuals collecting and transporting samples, times and dates of sample collection and analysis.

-- general test description: origin and age of test organisms, dates and results of reference toxicant tests; light and temperature regimes; other information on test conditions is listed in Section V. Test Conditions and Methods.

-- all chemical and physical data generated (include detection limits).

-- copies of raw data sheets and/or bench sheets.

-- dechlorination procedure(s).

-- any other observations or test conditions affecting the test outcome.

Toxicity test data that is required includes the following:

-- comparison of performance of controls with test acceptability criteria.

PART C

OTHER REQUIREMENTS

-- daily survival of test organisms in the controls and all replicates for each dilution. Survival data should be analyzed by Fisher's exact test prior to analysis of reproduction data.

-- NOEC: No Observed Effect Concentration.

-- LOEC: Lowest Observed Effect Concentration.

-- chronic value (ChV): Geometric mean of the NOEC and LOEC.

-- acute endpoints shall be derived from data obtained 48 hours into the chronic test. Survival data for each concentration and replication at 24 hours and 48 hours shall be obtained. LC50 and 95% confidence limits shall be calculated using the following methods: binomial, moving average, moving average-angle, probit, trimmed Spearman-Karber, or the graphical method (EPA/600/4-85/013). All printouts or copies of hand calculations must be submitted. The probit, trimmed Spearman-Karber, and moving average-angle methods can only be used when at least two test concentrations exhibit some (but not all) test organism mortality (partial mortality). If a test results in a 100% survival in one test concentration, and 100% mortality in an adjacent concentration (an "all or nothing" effect), and LC50 value can be estimated using the graphical method.

Chronic reference toxicant test, on both species, shall be conducted monthly in laboratories that maintain their own culturing facilities, while laboratories that secure test organisms from outside suppliers shall conduct chronic reference toxicant test on each separate batch of test organisms. These test shall be conducted similarly to the effluent toxicity test (same dilution water, test organisms and conditions, chemical analyses, etc.) and shall follow guidelines put forth in EPA/600/4-89/001. The reference toxicant shall be a commonly used toxicant approved by the EPA. Reports of reference toxicant tests shall include all information needed for the proper evaluation of the test, including (but not limited to) the following:

-- Water chemistry parameters of controls and test concentrations.

-- Chronic and if applicable, acute endpoint(s), with appropriate statistical analyses.

-- Control charts (for point estimates, cumulative mean + two standards deviations; for NOEC's central tendency + one concentration interval).

VIII Reporting.

Signed copies of each toxicity test's data/reports shall be submitted to DER and EPA at the addresses listed below within thirty (30) days of test completion, so that each individual test result can be reviewed and evaluated for content and performance prior to the initiation of the succeeding quarterly test.

PART C

OTHER REQUIREMENTS

If after review of test data, EPA or the Department may instruct the city to make appropriate changes in the test procedures.

U.S. Environmental Protection Agency, Region III
PA/DC Permit Section, 3WM53
841 Chestnut Building
Philadelphia, PA 19107

Pennsylvania Department of Environmental Resources
Bureau of Water Quality Management
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

R. This permit may be reopened to incorporate the requirements or recommendation resulting from the Estuary Toxics Study being conducted by the Delaware River Basin Commission.

S. An excursion of the lower pH limitation in the effluent, resulting from the use of the Oxygen Activated Sludge process, shall not be considered as a violation of this permit provided that the excursion frequency does not exceed 2.0% of the time on an annual basis and the pH is not less than 5.5 Standard Units.

T. Chlorine Minimization

The permittee shall implement a Chlorine Minimization Plan similar to the Southwest Chlorine Minimization Plan submitted to EPA 4/2/91, according to the following schedule:

Permit Issuance Date (PID)

Description of Activity	Due Date (Actual dates to be entered at issuance)
Chemical and Toxicity Evaluation	PID + 12 months
Determination of minimal chlorine dose necessary to achieve fecal coliform level of <200 MPN/100ml.	
Evaluation of toxicity of samples using minimal chlorine dosage and the minimal dosage plus a margin of safety.	
Evaluation of toxicity of dechlorinated post chlorinated effluent.	

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Chemical evaluation of chlorinated and dechlorinated effluent.	
Engineering evaluation of facility's ability to reduce effluent toxicity by maintaining minimum chlorine dose or dechlorination of effluent.	PID + 15 months
Evaluate whether an alternative disinfection system or modification of existing chlorination system should be used.	PID + 20 months
Selection of control option	PID + 26 months
Implementation of selected option	PID + 38 months

(NPDW)3./.9

Southwest Water Pollution Control Plant
Existing And Draft NPDES Permits

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
1875 New Hope Street
Norristown, PA 19401
215 270-1975

cc: Wonk
Birch
Herbert
Davis

SW

cc T. Laubitta
J. Coyne

September 22, 1986

Permit + DMR

Southwest Water Pollution Plant
City of Philadelphia Water Department
Executive Offices, 5th Floor
One Reading Center
1101 Market Street
Philadelphia, PA 19107

Attention: William J. Marrazzo
Commissioner

Re: Sewage NPDES Permit PA 0026671
Southwest Water Pollution
Control Plant
City of Philadelphia
Water Department
Philadelphia County

Gentlemen:

Referenced permit is enclosed.

In accordance with Other Requirements Item G (p. 14) please note that work is to begin on a Toxics Reduction Plan by November 1, 1986. The first progress report is due on May 1, 1987. For your reference, we have enclosed a copy of the "Guidelines for Conducting a Toxics Reduction Evaluation" dated October, 1985.

It will be necessary for you to submit a completed Discharge Monitoring Report (DMR) on a monthly basis to the appropriate agencies (see p. 5 of the NPDES permit and p. 14 Other Requirements).

The Environmental Protection Agency will be sending you computer generated, preprinted discharge monitoring report (DMR) forms for your submittals. In the event that these forms are not received, use the attached DMR forms. Should you find significant discrepancies between the two versions, contact this office and use the attached form until the preprinted forms are corrected. Do not allow a problem with the preprinted forms to cause your failure to submit these reports in a timely manner as this will result in violations of your permit.

Please study the permit carefully and direct any questions to the Permits Section of this office.

To become operative this permit must be recorded in the Office of the Recorder of Deeds in the county in which the discharge is located. Enclosed is a certificate and pre-addressed envelope for this purpose. Please have the Recorder of Deeds accomplish the certificate and return it within ten (10) days.

Very truly yours,

Joseph A. Feola

JOSEPH A. FEOLA
Regional Water Quality Manager

ENCLOSURES: Permit
Master Discharge Monitoring Report
Recorder of Deeds Certificate with envelope
Notary Public Certificate
Guidelines for Conducting a Toxics Reduction Evaluation (Revised October, 1985)
Analytical Methods and Sample Collection, Preservation and Handling Techniques for the 126 Priority Pollutants (January 1985)
Suggested Method for the Determination of Free Cyanide (Draft) May 198

cc: Mr. William Wankoff, City of Philadelphia Water Department
(Transmittal Letter Only
EPA
DRBC
Permits & Compliance
Re 30 NPDW/

ER-RWQ-15.2 (3/81)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF WATER QUALITY MANAGEMENT

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
SEWAGE PERMIT NO. PA 0026671

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 et seq. (the "Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 et seq.,

Southwest Water Pollution Control Plant
City of Philadelphia Water Department

is hereby authorized to discharge from a facility located in

The City of Philadelphia
Philadelphia

to the receiving waters named Delaware River (Zone 4), Point Source 001; Schuylkill River, Point Sources 002 through 040 and 073 through 077; Cobbs Creek, Point Sources 041 through 072 an 078 through 084

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B, and C hereof.

This permit and the authorization to discharge shall expire at midnight 9/22/91.

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the standard or special conditions, and the terms and conditions of this permit, the terms and conditions shall apply.

2. Failure to comply with any of the terms or conditions of this permit is grounds for enforcement action; for permit termination, revocation and reissuance or modification; or for denial of a permit renewal application.

3. It is required by law that this permit, before becoming operative, shall be recorded in the Office of the Recorder of Deeds for the county wherein the outlet of said sewer system is located.

4. Application for renewal of this permit, or notification of intent to cease discharging by the expiration date, must be submitted to the Department at least 180 days prior to the above expiration date (unless permission has been granted by the Department for submission at a later date), using the appropriate NPDES Permit Application Form. In the event that a timely and complete application for renewal has been submitted and the Department is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit will be automatically continued and will remain fully effective and enforceable pending the grant or denial of the application for permit renewal.

5. This permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

PERMIT ISSUED

DATE 9/22/86

BY Joseph A. Feola
Joseph A. Feola
TITLE Regional Water Quality Manager

PART C

OTHER REQUIREMENTS

Central Schuylkill East Side

Point Source	Interceptor Regulator Name	Longitude	Latitude
075	Main Relief Sewer - S. of Fairmount Ave. and Schuylkill River	75°11'01"	39°58'10"
076	24th St. N. of Chestnut St. Bridge (S-12)	75°10'50"	39°57'11"

K. The permittee shall operate the sewage treatment plant to provide treatment for the maximum design wastewater flows of 300 MGD (maximum daily average) and 400 MGD (peak) without causing treatment process upsets. Throttling of influent flows to the Plant resulting in avoidable, premature sewer system overflows is prohibited.

L. An average monthly flow in excess of 200 MGD shall not be considered to be a violation of this permit.

M. The mass limitation for BOD_5 shall not become effective until January 1, 1989. During the period January 1, 1987 through December 31, 1987 influent data (without impact of recycle streams) and effluent data shall be collected relative to BOD_5 (uninhibited) on a daily basis and First Stage Oxygen Demand (FSOD) on a twice per week basis. This data base will be used to determine whether the existing FSOD allocation, the equivalent BOD_5 mass effluent limitation and/or the current $FSOD/BOD_5$ ratio should be revised. Progress reports shall be submitted to the Delaware River Basin Commission and the Department by April 30, 1987 and September 30, 1987. A final report shall be submitted to the same agencies on or before March 31, 1988.

N. An excursion of the lower pH limitation in the effluent, resulting from the use of the Oxygen Activated Sludge process, shall not be considered as a violation of this permit so long as the excursion frequency does not exceed 2.0% of the time on an annual basis and the pH is not less than 5.5 standard units.

(2NPDW5).4/.4.8

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001;
LOCATED AT LATITUDE 75°13'13", LONGITUDE 39°52'08"

A. During the period beginning at issuance and lasting through expiration, the Permittee is authorized to discharge.
B. The average monthly flow of effluent discharged from the wastewater treatment facility shall not exceed 200 million gallons per day. (a)
C. The quality of effluent shall be limited at all times as specified in Footnote (3) and as follows:

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)			CONCENTRATIONS (mg/l)						
	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.1
FLOW (MGD)								Continuous	Measured	
BOD-5 (b)	21,650	32,475		30	45		60	Daily	24 Hr. Comp.	
BOD-5 % Removal (g)	DRBC Zone 4 Requirement of 89.25%							Daily	24 Hr. Comp.	
SUSPENDED SOLIDS	50,040	75,060		30	45		60	Daily	24 Hr. Comp.	
*SOD (c)	37,020							2/Week	24 Hr. Comp.	
FECAL COLIFORM (5-1 to 9-30)				See Footnote (2)				Daily	Grab	
FECAL COLIFORM (10-1 to 4-30)				Same Limits as in Footnote (2)				Daily	Grab	
pH (f)	Within Limits of 6 to 9 Standard Units at all times							Daily	Grab	
NH_3-N			Monitor Only					1/Week	24 Hr. Comp.	
TKN			Monitor Only					1/Week	24 Hr. Comp.	
NO_3-N			Monitor Only					1/Week	24 Hr. Comp.	
NO_2-N			Monitor Only					1/Week	24 Hr. Comp.	

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001;
LOCATED AT LATITUDE 75°13'13", LONGITUDE 39°52'08"

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)			CONCENTRATIONS (mg/l)						
	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.I
LUMINUM, TOTAL d)					Monitor Only			2/Month	24 Hour Comp.	
RON, DISSOLVED, d)					Monitor Only			2/Month	24 Hour Comp.	
ILVER, TOTAL d) & (e)					Monitor Only			2/Month	24 Hour Comp.	
INC, TOTAL d)					Monitor Only			2/Month	24 Hour Comp.	
YANIDE, FREE d) & (e)					Monitor Only			2/Month	24 Hour Comp.	
HENOLICS, TOTAL AAP) (d)					Monitor Only			2/Month	24 Hour Comp.	
IN, TOTAL d) & (e)					Monitor Only			2/Month	24 Hour Comp.	
ITANIUM, TOTAL d) & (e)					Monitor Only			2/Month	24 Hour Comp.	

a) See Paragraph L, Other Requirements (pg. 14h of 14)
b) See Paragraph M, Other Requirements (pg. 14h of 14)
c) FSOD - First Stage Oxygen Demand - (20 day Biochemical Oxygen Demand Test with Nitrogenous Oxygen Demand Inhibited)
d) See Other Condition G - Water Quality - Based Effluent Limitations and Other Requirements for Management of Toxic Pollutants. (pg. 14a of 14)
e) See Other Condition I, for specific test methods. (pg. 14d of 14)
f) See Paragraph N, Other Requirements (pg. 14h of 14)
g) See Paragraph F, Other Requirements (pg. 14 of 14)

FOOTNOTES: 1. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfall 001 Delaware River (Zone 4), at the Pier Effluent Sampling Building.

(Footnotes Continued)

2. Effective disinfection to control disease producing organisms during the swimming season (May 1 through September 30) shall be the production of an effluent which will contain a concentration not greater than 200/100 ml of fecal coliform organisms as a geometric average value, nor greater than 1,000/100 ml of these organisms in more than 10% of the samples tested.

3. In no case shall the arithmetic means of the effluent values of the BOD_5 and Suspended Solids discharged during a period of 30 consecutive days exceed 10.75% and 15% respectively of the associated arithmetic means of the influent values for those parameters during the same time period, except as specifically authorized by the permitting authority.

D. Definitions

1. The term "bypass" means the discharge of partially treated or untreated sewage from any device or structure of sewerage facilities due to a power failure, equipment failure, hydraulic overload, and/or blockage in all or any part of the sewerage facilities. This is to distinguish it from an overflow which is the systematic discharge of a mixture of partially treated or untreated sewage and stormwater from any device or structure of combined sewerage facilities which is in excess of the downstream hydraulic carrying capacity of those facilities.

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

3. The "average monthly flow" means the arithmetic mean of daily flow measurements taken during a calendar month.

4. The "average monthly" mass discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the facility was operating. Where less than daily sampling is required by this permit, the (average) monthly mass discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made.

5. The "average weekly" mass discharge means the total discharge by weight during a calendar week divided by the number of days in the week that the facility was operating. Where less than daily sampling is required by this permit, the (average) weekly mass discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar week when the measurements were made.

6. The "maximum daily" mass discharge means the total discharge by weight during any calendar day.

7. The "average monthly" effluent concentration means the arithmetic average of all the daily determinations of concentration made during a calendar month.

8. The "average weekly" effluent concentration means the arithmetic average of all the daily determinations of concentration made during a calendar week.

9. The "maximum daily" effluent concentration means the daily determination of concentration for any calendar day.

10. The "instantaneous maximum" concentration means the concentration not to be exceeded at any time in any grab sample.

11. The "daily determination of concentration" means the concentration of a composite sample taken during a calendar day or the arithmetic average of all grab samples taken during a calendar day.

12. The term "composite sample" means a combination of individual samples obtained at regular intervals over a time period. The maximum time period between individual samples shall not exceed two hours.

13. The term "grab sample" means an individual sample collected in less than 15 minutes.

14. The term "measured flow" means any method of liquid volume measurement the accuracy of which has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.

15. The term "estimate" means to be based on a technical evaluation of the sources contributing to the discharge including, but not limited to, pump capabilities, water meters and batch discharge volumes.

16. The term "Industrial User" means an establishment which discharges or introduces industrial wastes into a Publicly Owned Treatment Works (POTW).

17. The term "Publicly Owned Treatment Works" or "POTW" means a facility as defined by Section 212 of the Clean Water Act which is owned by a State or Municipality, as defined by Section 502(4) of the Clean Water Act, including any sewers that convey wastewater to such a treatment works, but not including pipes, sewers or other conveyances not connected to a facility providing treatment. The term also means the municipality as defined in Section 502(4) of the Clean Water Act which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.

II. MONITORING AND REPORTING

A. Representative Sampling and Test Procedures

1. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Unless otherwise specified in this permit, the test procedures for analysis of pollutants shall be those contained in 40 CFR Part 136, or alternate test procedures approved pursuant to that part.

B. Self-Monitoring and Reporting Requirements

The permittee shall effectively monitor the operation and efficiency of all treatment and control facilities and the quantity and quality of the discharge. Monitoring data required by this permit shall be submitted monthly.

--A Discharge Monitoring Report (DMR) properly completed and signed by the treatment plant operator in responsible charge, must be submitted within 45 days after the end of each monthly report period. Notification of the designation of the responsible operator must be submitted to the permitting agency by the permittee within 60 days after the effective date of the permit and from time to time thereafter as the operator is replaced. The DMR must be sent to the Department and the EPA Regional Office at the following addresses:

Department of Environmental Resources
Bureau of Water Quality Management
1875 New Hope Street
Norristown, Pennsylvania 19401

Pennsylvania Section (3WM52)
Permits, Water Branch
Water Division
U.S. Environmental Protection Agenc
Region III
841 Chestnut Building
Philadelphia, PA 19106

C. If the permittee monitors any pollutant, using analytical methods described in Part A.2.A(2) above, more frequently than the permit requires, the results of this monitoring shall be incorporated, as appropriate, into the calculations used to report self-monitoring data on the DMR.

D. Non-Compliance Reporting

1. 24-Hour Reporting:

The permittee shall orally report to the Department within 24 hours of becoming aware of the following:

(a) Actual or anticipated non-compliance with any term or condition of this permit which may endanger health or the environment.

(b) Actual or anticipated non-compliance with any "maximum daily" discharge limitation which is identified in Part A1 of this permit as being either:

(i) A toxic pollutant effluent standard established by EPA pursuant to Section 307(a) of the Clean Water Act, or

(ii) A toxic or hazardous pollutant which, if not adequately treated, could constitute a threat to human health, welfare, or the environment,

(iii) Any pollutant identified as the method to control a toxic pollutant or hazardous substance (i.e., indicator pollutant).

(c) Any unanticipated bypass which exceeds any effluent limitations in the permit.

(d) Where the permittee orally reports this information within the above mentioned 24 hour time period, a written submission outlining the above information must be submitted to the Department within 5 days of becoming aware of such a condition, unless this requirement is waived by the Department upon receipt of the oral report.

2. Other Non-Compliance Reporting.

(a) The permittee shall give advance notice to the Department of any planned changes to the permitted activity or facility which may result in non-compliance with permit requirements.

(b) Where the permittee knows in advance of the need for a bypass which will exceed effluent limitations it shall submit prior notice to the Department at least 10 days, if possible, before date of the bypass.

(c) The permittee shall report all instances of non-compliance which are not reported above at the time of DMR submission.

3. The reports and notifications required above shall contain the following information:

(a) A description of the discharge and cause of non-compliance;

(b) The period of non-compliance, including exact date and times and/or the anticipated time when the discharge will return to compliance; and

(c) Steps being taken to reduce, eliminate, and prevent recurrence of the non-complying discharge.

E. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

1. The exact place, date, and time of sampling or measurement.

2. The person(s) who performed the sampling or measurement.

3. The dates the analyses were performed.

4. The person(s) who performed the analyses.

5. The analytical techniques or methods used.

6. The results of such analyses.

F. Records Retention

All records of monitoring activities and results (including all original strip chart recordings for continuous monitoring instrumentation and calibration and maintenance records), copies of all reports required by this permit, and records of all data used to complete the application for this permit shall be retained by the permittee for three (3) years. The three year period shall be extended as requested by the Department or the EPA Regional Administrator.

III. SCHEDULE OF COMPLIANCE

The permittee shall achieve compliance with final effluent limitations or terminate this discharge in accordance with the following schedule:

A. Feasibility study completion _____

B. Final plan completion _____

C. Start construction _____

D. Construction progress report(s) _____

E. End construction _____

F. Compliance with effluent limitations _____

G. Terminate discharge _____

No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit to the Department a written notice of compliance or non-compliance with the specific schedule requirement(s). Each notice of non-compliance shall include the following information:

A. A short description of the noncompliance.

B. A description of any actions taken or proposed by the permittee to comply with the elapsed schedule requirement.

C. A description of any factors which tend to explain or mitigate the noncompliance.

D. An estimate of the date that compliance with the elapsed schedule requirement will be achieved and an assessment of the probability that the next scheduled requirement will be met on time.

I. MANAGEMENT REQUIREMENTS

A. Publicly Owned Treatment Works (POTW)

1. Where the permittee is a Publicly Owned Treatment Works (POTW), the permittee shall provide adequate notice as discussed in A(2) below to the Department of the following:

   (a) Any new introduction of pollutants into the POTW from an Industrial User which would be subject to Sections 301 and 306 of the Clean Water Act if it were otherwise discharging directly into waters of the United States.

   (b) Any substantial change in the volume or character of pollutants being introduced into the POTW by an Industrial User which was discharging into the POTW at the time of issuance of this permit.

   (c) Any change in the quality and quantity of effluent introduced into the POTW.

   (d) The identity of significant Industrial Users served by the POTW which are subject to pretreatment standards adopted under Section 307(b) of the Clean Water Act; the POTW shall also identify the character and volume of pollutants discharged into the POTW by the Industrial User.

2. The submission of the above information in the POTW's annual Wasteload Management Report, required under the provisions of 25 Pa. Code Chapter 94 will normally be considered as providing adequate notice to the Department. However, if the above changes in industrial pollutant loadings to the POTW are significant enough to warrant either modification or revocation and reissuance of this permit, then the permittee is required to meet the provisions of Management Requirements B below.

3. The POTW shall require all Industrial Users to comply with the reporting requirements of Sections 204(b), 307, and 308 of the Clean Water Act and any regulations adopted thereunder, and the Clean Streams Law and any regulations adopted thereunder.

B. Permit Modification, Termination, or Revocation and Reissuance

1. This permit may be modified, terminated, or revoked and reissued during its term for any of the causes specified in 25 Pennsylvania Code, Chapter 92.

2. The filing of a request by the permittee for a permit modification, revocation and reissuance, or a notification of planned changes or anticipated non-compliance does not stay any permit condition.

3. Notwithstanding the above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for toxic pollutant which is present in the discharge authorized herein and such standard or prohibition is more stringent than any limitation upon such pollutant in this permit, this permit shall be modified or revoked and reissued in accordance with the toxic effluent standard or prohibition and the permittee shall be so notified.

In the absence of a Departmental action to modify or to revoke and reissue this permit, any toxic effluent standard or prohibition established under Section 307(a) of the Act is considered to be effective and enforceable against the permittee.

C. Right of Entry

Pursuant to Sections 5(b) and 305 of Pennsylvania Clean Streams Law and 25 Pennsylvania Code, Chapter 92, the permittee shall allow the head of the Department, the EPA Regional Administrator, and/or their authorized representatives, upon the presentation of credentials:

1. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit.

2. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit and other documents as may be required by law.

3. To inspect at reasonable times any monitoring equipment or monitoring method required in this permit.

4. To inspect any collection, treatment, pollution management, or discharge facilities required under the permit.

5. To sample any substances or parameters at any location.

D. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges; nor does it authorize any injury to private property or any invasion of personal rights.

E. Duty to Provide Information

1. The permittee shall furnish to the Department within a reasonable time, any information which the Department may request to determine whether cause exists for modifying revoking and reissuing, or terminating this permit, or to determine compliance with this permit.

2. The permittee shall furnish to the Department, upon request, copies of records required to be kept by this permit.

3. Planned changes: The permittee shall give advance notice to the Department of any physical alterations or additions to the permitted facility.

4. Other Information: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information to the Department.

F. Confidentiality

Except for data determined to be confidential under 25 Pennsylvania Code, Chapter 92, all required reports shall be available for public inspection at the offices of the Department and the EPA Regional Administrator. Effluent data shall not be considered confidential.

G. Facility Operation and Quality Control

The permittee shall at all times maintain in good working order and properly operate all facilities and systems (and related appurtenances) for collection and treatment which are installed or used by the permittee for water pollution control and abatement to achieve compliance with the terms and conditions of the permit. Proper operation and maintenance includes but is not limited to effective performance based on designed facility removals, adequate funding, effective management, adequate operator staffing and training, and adequate laboratory and processing controls including appropriate quality assurance procedures. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with this permit.

H. Bypassing

1. Bypassing Not Exceeding Permit Limitations: The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if the bypass is for essential maintenance to assure efficient operation. This type of bypassing is not subject to the reporting and notification requirements of Part A.2.D above.

2. In all other situations, bypassing is prohibited unless the following conditions are met:

   (a) A bypass is unavoidable to prevent loss of life, personal injury or "severe property damage";

   (b) There are no feasible alternatives to a bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment down-time; (This condition is not satisfied if the permittee could have installed adequate backup equipment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance.); and

   (c) The permittee submitted the necessary reports required under Part A.2.D. above.

3. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the conditions listed under Part B.I.2. above.

I. Adverse Impact

Permittee shall take all reasonable steps to minimize any adverse impact on the environment resulting from noncompliance with this permit.

J. Solids Disposal

Collected screenings, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those waters (or runoff from the wastes) into waters of the Commonwealth.

K. Penalties and Liability

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

2. Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for non-compliance pursuant to Section 309 of the Clean Water Act or Sections 602 or 605 of the Clean Streams Law.

L. Transfer of Ownership or Control

1. No permit may be transferred unless approved by the Department.

2. In the event of any pending change in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the Department by letter of such pending change at least thirty days prior to the change in ownership or control.

3. The letter shall be accompanied by the appropriate Department forms for transfer of the permit and a written agreement between the existing permittee and the new owner or controller stating that the existing date of permit transfer and that the new owner or controller shall be liable for permit violations from that date on.

4. After receipt of the documentation above, the Department shall notify the existing permittee and the new owner or controller of its decision concerning approval of the transfer. In approving a transfer the Department may modify or revoke and reissue the permit.

5. In the event the Department does not approve transfer of the permit, the new owner or controller must submit a new permit application.

M. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

N. Other Laws

Nothing herein contained shall be construed to be an intent on the part of the Department to approve any act made or to be made by the permittee inconsistent with the permittee's lawful powers or with existing laws of the Commonwealth regulating sewerage discharge and the practice of professional engineering, nor shall this permit be construed to sanction any act otherwise forbidden by federal or state law or regulation, or by local ordinance. Nor does it pre-empt any duty to obtain State or local assent required by law for the discharge(s).

PART C

OTHER REQUIREMENTS

A. Effluent limitations, monitoring requirements, and other standard and special conditions which relate to the discharge(s) of pollutants authorized by this permit and which are contained in Water Quality Management Permit(s)

No. 9213S, 766S2, 5172419 issued on February 27, 1959, April 26, 1966, October 1, 1973

are superseded by the terms and conditions of this permit, unless specifically noted otherwise herein.

B. A copy of the Discharge Monitoring Report is to be sent to the following agency:

Delaware River Basin Commission
P.O. Box 7360
West Trenton, New Jersey 08628

C. The approval herein given is specifically made contingent upon the permittee acquiring all necessary property rights by easement or otherwise, providing for the satisfactory construction, operation, maintenance and replacement of all sewers or sewerage structures associated with the herein approved discharge in, along, or across private property, with full rights of ingress, egress and regress.

D. For reporting purposes on the Discharge Monitoring Report, the term "average weekly" shall mean the highest average weekly value observed during the monthly monitoring period.

E. If, in the opinion of the Department, the sewage treatment plant is not so operated or if by reason of change in the character of the waste or increased load upon the sewage treatment plant, or changed use or condition of the receiving body of water, or otherwise, that the effluent ceases to be satisfactory or the sewage treatment plant creates a public nuisance, then upon notice by the Department the right herein granted to discharge such effluent shall cease and become null and void unless within the time specified by the Department, the permittee shall adopt such remedial measures as will produce an effluent which, in the opinion of the Department, will be satisfactory for discharge into the receiving body of water.

F. The BOD_5 in the raw wastewater shall be reduced by at least 89.25% as a monthly average in accordance with the requirements of the Delaware River Basin Commission for Zone 4 of the Delaware Estuary. The percent removal shall be calculated from daily 24 hour composite samples of the influent and effluent. The influent samples must reflect true characteristics of the raw wastewater and must not be affected by plant recycle flows.

The BOD_5 percentage removal requirement of 89¼% will be relaxed to 86% when the influent BOD_5 concentration is less than 110 mg/l on a monthly average basis so long as the FSOD allocation, the equivalent mass BOD_5 limitation and an effluent BOD_5 concentration of 15 mg/l are not exceeded on a monthly average basis.

PART C

OTHER REQUIREMENTS

e. Procedures for Demonstration of Alternative Site-Specific Bioassay-Based Effluent Limitations

Where the water quality-based effluent limitations listed in this Part C have been developed by the Department for protection of fish and aquatic life, the Permittee may request an opportunity to demonstrate alternative, site-specific, bioassay-based "safe concentration values" for the pollutants in question.

The following water quality-based effluent limitations in this Part C are based on protection of fish and aquatic life:

Aluminum, Silver, Zinc, Tin, Titanium.

The procedures for carrying out such demonstrations shall be approved in writing by the Department, and shall be conducted in accordance with the requirements of Sections 93.8(d)-(e) of the Department's Rules and Regulations.

Requests for alternative, site-specific, bioassay-based effluent limitations, including all documentation required to support such a request, must be submitted to the Department along with the Permittee's TRE as required under this Part C.

Where the demonstration results in more stringent limitations than those established by the Department in this Part C, the more stringent limitations will apply. Any less stringent limitations which are approved by the Department shall not violate applicable criteria for the protection of human health. This procedure does not apply to those parameters for which specific numeric criteria are listed in Section 93.7, Table 3 of the Department's Rules and Regulations.

H. The following requirements shall apply with regard to implementation of the required industrial pretreatment program.

(a) The permittee shall operate an industrial pretreatment program in accordance with Section 402(b)(8) of the Clean Water Act and the General Pretreatment Regulations (40 CFR Part 403). The program shall also be implemented in accordance with the approved POTW pretreatment program submitted by the permittee.

(b) The permittee shall submit to EPA and DER an annual report that describes the permittee's program activities over the previous 12 months. The permittee must also report on the pretreatment program activities of all participating agencies, if more than one jurisdiction is involved in the local program.

(c) The report shall be incorporated into and submitted with the permittee's annual Municipal Wasteload Management report required by DER's Chapter 94 Rules and Regulations. The report shall include the following:

PART C

OTHER REQUIREMENTS

1) Compliance with Categorical and Local Standards - A summary of the compliance status for those industries affected by final Categorical Pretreatment Standards.

2) Review of Industrial Compliance - Information on the number and type of major violations of pretreatment regulations, and the actions taken or planned by the POTW to obtain compliance.

3) Summary of Industrial User Inspections - A summary of the number and type of industrial user inspections by the POTW.

4) Summary of POTW Operations - Any interference, upset, or permit violations experienced at the POTW directly attributable to industrial users, and actions taken to alleviate said events. Sampling and analysis of POTW influent, effluent, and sludge for toxic and incompatible pollutants shall also be included.

5) Pretreatment Program Changes - A description of any significant changes in operating the program from the original submission, including staffing and funding. An updated industrial survey shall be included, as appropriate.

6) Other Miscellaneous Pretreatment Developments - POTW facility changes, problems or improvements regarding sludge, water quality, data management, or any special concerns.

(d) EPA and DER retain the right to require the POTW to institute changes to its local pretreatment program:

1) If the program is not implemented in a way satisfying the requirements of 40 CFR 403;

2) If problems such as interference, pass through, or sludge contamination develop or continue;

3) If other Federal, State or local requirements (i.e., water quality standards) change.

I. Analysis for the following pollutant(s) shall be performed using the following test method(s) contained in the EPA publication entitled Methods for Chemical Analysis of Water and Wastes, or any approved test method(s) of equal or greater sensitivity.

Silver	EPA Method 272.2 Graphite Furnance A.A.
Cyanide, Free	See Suggested PA. DER method for Determination of Free, Cyanide (Draft 5-84)
Tin	EPA Method 282.2 Graphite Furnance A.A.
Titanium	EPA Method 283.2 Graphite Furnance A.A.

PART C

OTHER REQUIREMENTS

G.. Water Quality-Based Effluent Limitations and Other Requirements for Management of Toxic Pollutants

a. Water Quality-Based Effluent Limitations

In addition to the effluent limitations shown in Part A of this permit, the Permittee is expected to achieve the water quality-based effluent limitations shown below.

No final date for compliance with these limitations is shown. The Department will modify this permit to establish a final compliance date, if necessary, upon the submittal by the Permittee and review by the Department of an acceptable Toxics Reduction Evaluation (TRE), or the failure of the Permittee to submit an acceptable TRE under the schedule established under Section G.b. of this Part C. The Permittee must submit the following requests, along with supporting documentation, to the Department at the time of submission of the TRE:

(1) A request for modification of water quality-based effluent limitations shown below; and/or,

(2) A request for an extension of time to achieve the water quality-based effluent limitations shown below; and/or,

(3) A request for alternative bioassay-based effluent limitations.

For purposes of compliance, effluent limitations listed in Part A of this permit apply unless changed by order, permit modification or other Department action.

Submittal by the Permittee of a TRE shall not be deemed to affect the appeal rights of the Permittee of final water quality-based effluent limitations upon action of the Department to make the limitations effective.

Outfall 001

Parameter	Units	Average Monthly	Maximum Daily	Instantaneous Maximum
Aluminum	mg/l	2.3		4.6
Iron, Dissolved	mg/l	0.921		1.84
Silver, Total	mg/l	0.005		0.010
Zinc, Total	mg/l	0.18		0.36
Cyanide, Free	mg/l	0.011		0.022
Phenolics, Total (4AAP)	mg/l	0.047		0.094
Tin, Total	mg/l	0.036		0.072
Titanium, Total	mg/l	0.108		0.216

PART C

OTHER REQUIREMENTS

b. Toxics Reduction Evaluation (TRE)

In order to (1) verify the actual extent of the toxic pollutants associated with the wastewater, (2) determine sources of these toxic pollutants, and (3) recommend control and/or treatment technologies to reduce or eliminate these toxic pollutants, the Permittee is directed to carry out a Toxics Reduction Evaluation (TRE) in accordance with guidelines developed by the Department.

The Permittee shall submit three (3) copies of the completed TRE to the Department for review in accordance with the following schedule:

Step	Date
Begin Work on the TRE and so Notify the Department	11/01/86
Submit a Progress Report to the Department	05/01/87
Submit a Progress Report to the Department	11/01/87
Submit a Progress Report to the Department	05/01/88
Submit the Completed TRE to the Department	11/01/88

c. Modification of Permit to Incorporate Water Quality-Based Effluent Limitations for Toxic Pollutants

Upon approval of the TRE and any additional submittals for the above toxic pollutants of concern, the Department will modify Part A of this permit to reflect the effluent limitations, monitoring requirements, and other conditions necessary for compliance with water quality standards.

A permit modification may include a schedule of compliance. Any such permit modification will be conducted in accordance with applicable permit modification procedures, which include development of draft and final permits and associated public notification requirements.

d. Procedures for Granting Extensions of Time to Achieve Water Quality-Based Effluent Limitations

At the request of the Permittee, in conjunction with modifying the permit to incorporate water quality-based effluent limitations under Subsection c. above, the Department may grant an extension of time to achieve the water quality-based effluent limitations shown in Subsection a. above, provided the Permittee meets all of the eligibility requirements contained in Section 95.4 of the Department's Rules and Regulations.

Requests for Section 95.4 time extension, including all documentation required to support such a request, must be submitted to the Department along with the Permittee's TRE as required under Subsection b. above.

PART C

OTHER REQUIREMENTS

J. Point Sources 002 through 084 (listed below) serve as combined sewer reliefs necessitated by stormwater entering the sewer system and exceeding the ydraulic capacity of the sewers and/or the treatment plant and are permitted to discharge only for such reason. There are at this time no specific effluent limitations on these discharges. The regulating chambers shall be maintained in operable condition including regular monitoring and inspection of regulator controls within the combined sewer system and prompt repair or replacement of malfunctioning regulator controls. Results of the inspections shall be submitted monthly as part of the Discharge Monitoring Report. (Interceptors Services Report)

Schuylkill River

Lower Schuylkill East Side

Point Source	Interceptor Regulator Name	Longitude	Latitude
002	Reed St. & Schuylkill Ave (S31)	75°12'18"	40°56'17"
003	34th St. & Mifflin Sts. (S36A)	75°12'25"	39°55'55"
004	Vare Avenue & 29th St. (S-37)	75°12'37"	39°55'41"
005	Passyunk Ave. & 29th St. (S-42)	75°12'05"	39°55'11"
006	Passyunk Ave. & 28th St. (S-42A)	75°12'05"	39°55'11"
007	26th St. 700' N of Hartranft St. (S-44)	75°12'13"	39°54'53"
008	Penrose Ave. & 26th St. (S-46)	75°12'40"	39°53'54"

Central Schuylkill East Side

009	24th St. 155' S of Parktowne Place (S-5)	75°10'49"	39°57'41"
010	24th St. 350' S of Parktowne Place (S-6)	75°10'50'	39°57'39"
011	24th St E. of Schuylkill River (S-7)	75°10'47"	39°57'37"
012	Race St & Bonsall St. (S-8)	75°10'45"	39°57'30"
013	Arch St. W. of 23rd St. (S-9)	75°10'46"	39°57'24"
014	Market ST. 25' E. of 24th St. (S-10)	75°10'48"	39°57'16"
015	Chestnut St. & 24th St. (S-12A)	75°10'50"	39°57'11"
016	Sansom St. W. of 24th St. (S-13)	75°13'52"	39°57'08"
017	Walnut St. W. of 24th St. (S-15)	75°10'54"	39°57'05"
018	Locust St. & 25th St. (S-16)	75°10'56"	39°57'00"
019	Spruce St. & 25th St. (S-17)	75°11'00"	39°56'57"
020	Pine St. W of Taney St. (S-18)	75°11'06"	39°56'53"
021	Lombard St. W. of 27th St. (S-19)	75°11'09"	39°56'52"
022	South St. E. of 27th St. (S-21)	75°11'12"	39°56'48"
023	Schuylkill Ave. & Bainbridge St. (S-23)	75°11'17"	39°56'45"

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OTHER REQUIREMENTS

Point Source	Interceptor Regulator Name	Longitude	Latitude
024	Schuylkill Ave. & Christian St. (S-25)	75°11'28"	39°56'36"
025	Ellsworth St. W. of Schuylkill Ave. (S-26)	75°11'35"	39°56'30"
	Central Schuylkill Interceptor Central Schuylkill West Side		
026	Mantua Ave. & West River Drive (S-1)	75°11'17"	39°58'02"
027	Haverford Ave. & West River Drive (S-2)	75°11'06"	39°57'54"
028	Spring Garden St. W. of Schuylkill Expressway (S-3)	75°11'04"	39°57'53"
029	Powelton Ave. W. of Schuylkill Expressway (S-4)	75°10'56"	39°57'42"
030	Market St. in the PRR Baggage Rm (S-11)	75°10'53"	39°57'17"
031	Schuylkill Expressway and Walnut St. Bridge (S-14)	75°10'58"	39°57'05"
032	440 Ft. N. W. of South St. PRR Property (S-20)	75°11'12"	39°56'52"
033	660 Ft. S. of South St. E. of Pennfield (S-22)	75°11'22"	39°56'43"
034	1,060 Ft. S. of South St. E. of Pennfield (S-24)	75°11'26"	39°56'43"
	Southwest Main Gravity		
035	46th St. & Paschall Ave. (S-30)	75°12'23"	39°56'31"
036	43rd St. S.E. of Woodland Ave. (S-50)	75°12'18"	39°56'36"
077	42nd St. S.E. of Woodland Ave. (S-51)	75°12'18"	39°56'36"
	Lower Schuylkill West Side		
037	49th St. S. of Botanic St. (S-32)	75°12'23"	39°56'14"
038	51st ST. and Botanic St. (S-33)	75°12'23"	39°56'08"
039	56th St. E. of P&R Railroad (S-38)	75°12'49"	39°55'43"
040	67th St. E. of P&R Railroad (S-45)	75°12'58"	39°54'29"
	Discharge to Cobbs Creek Cobbs Creek Low Level		
041	60th St. & Cobbs Creek Parkway (C-18)	75°14'08"	39°56'11"
042	Mount Moriah Cemetary & 62nd St. (C-19)	75°14'19"	39°55'57"
043	65th St. & Cobbs Creek Parkway (C-20)	75°14'39"	39°55'46"
044	68th St. & Cobbs Creek Parkway (C-21)	75°15'40"	39°55'38"
045	70th St. & Cobbs Creek Parkway (C-22)	75°14'46"	39°55'27"
046	Upland St. & Cobbs Creek Parkway (C-23)	75°14'52"	39°55'14"
047	Woodland Ave. E. of Island Ave.	[illegible]	[illegible]

PART C

OTHER REQUIREMENTS

Point Source	Interceptor Regulator Name	Longitude	Latitude
048	75th St. & Grays Ave. (C-28)	75°14'55"	39°54'45"
078	Island Ave. S. E. of Glenmore Ave. (C-28A)	75°14'58"	39°54'60"
049	Claymont St. & Grays Ave. (C-29)	75°14'56"	39°54'75"
050	77th St. W. of Elmwood Ave. (C-30)	75°15'02"	39°54'34"
079	Saybrook Ave. & Island Ave. (C-26)	75°14'51"	39°55'00"
	Cobbs Creek High Level		
051	City Line Ave. & 73rd St. (C-1)	75°16'04"	39°58'51"
052	City Line Ave. 100 Ft. South Side of Creek (C-2)	75°16'02"	39°58'51"
053	Malvern Ave. & 68th St. (C-4)	75°15'28"	39°58'39"
054	Lebanon Ave. S. W. of 73rd St. (C-5)	75°15'26"	39°58'31"
055	Lebanon Ave. & 68th St. (C-6)	75°15'26"	39°58'31"
056	Lansdowne Ave. & 69th St. (C-7)	75°15'26"	39°58'27"
080	Paschall Ave. & Island Ave. (C-27)	75°14'51"	39°55'00"
081	Greenway Ave. & Cobbs Creek Parkway (C-24)	75°14'51"	39°55'00"
057	64th St. & Cobbs Creek (C-9)	75°14'57"	39°57'52"
058	Gross St. & Cobbs Creek (C-10)	75°14'53"	39°57'50"
059	Cobbs Creek Parkway S. of Market St. (C-11)	75°14'54"	39°57'43"
060	Spruce St. & Cobbs Creek (C-12)	75°14'59"	39°57'26"
061	62nd St. & Cobbs Creek (C-13)	75°14'57"	39°56'56"
062	Baltimore Ave. & Cobbs Creek (C-14)	75°14'50"	39°56'44"
063	59th St. & Cobbs Creek Parkway (C-15)	75°14'26"	39°56'32"
064	Thomas Ave. & Cobbs Creek (C-16)	75°14'22"	39°56'27"
065	Beaumont St. & Cobbs Creek (C-17)	75°14'06"	39°56'15"
066	Cobbs Creek Parkway S. of City Line Ave. (C-31)	75°16'50"	39°28'29"
067	Brockton Rd. & Farrington Rd. (C-33)	75°15'55"	39°38'13"
068	Woodcrest Ave. & Morris Park (C-34)	75°15'43"	39°58'41"
069	Morris Park W. of 72nd St. and Sherwood Rd. (C-35)	75°15'55"	39°58'46"
070	Woodbine Ave. S. of Brentwood Rd. (C-36)	75°15'33"	39°57'55"
071	Cobbs Creek Parkway S. of 67th St. and Callowhill St. (C-37)	75°15'15"	39°57'55"
072	Cobbs Creek Parkway & 77th St. (C-32)	75°16'12"	39°58'21"
082	Malvern Ave. N.W. of 68th St. (C-4A)	75°15'28"	39°58'39"
083	Thomas Run Relief Sewer - Cobbs Creek Parkway W. of Ashland St.	75°14'24"	39°56'29"
084	Arch St. Relief Sewer - Arch St. and Cobbs Creek	75°14'53"	39°57'48"
	Discharges to Schuylkill River Lower Schuylkill East Side		
073	35th St. & Mifflin St. (S-35)	75°12'25"	39°55'55"
074	36th St. & Mifflin St. (S-36)	75°12'25"	39°55'55"

PART C

OTHER REQUIREMENTS

O. Biomonitoring Requirements

Upon the effective date of this permit, the permittee shall initiate a 12-month biomonitoring program to assess the potential toxicity of the effluent on the aquatic life in the receiving stream. As a minimum, the following requirements shall be met in conducting this program:

a. For the first two months, toxicity tests shall be conducted on Ceriodaphnia and Fathead Minnow. After the first two months, toxicity tests shall be conducted only on the most sensitive organism. Twenty-Four hour composite samples shall be taken for 7 consecutive days each month. Each composite shall be used as daily renewal water for the 7 day chronic tests.

b. For each 24-hour composite sample taken, a chemical analysis of the sample shall be provided for BOD_5 and suspended solids.

c. The chemical monitoring required in this permit shall be conducted on at least one composite sample/month used in the biomonitoring tests.

d. Only chronic tests shall be conducted. The test procedures (including quality assurance) to be used are described in EPA's Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-600/4-85-014 December, 1985). The 0.5 dilution factor series shall be used in the toxicity testing.

e. Dilution water shall be obtained from a flow weighted composite of the raw water intakes servicing this facility. If the dilution water shows any toxicity, separate chronic tests shall be conducted from each of the sources of dilution water.

f. Separate tests shall be conducted on the treated effluent prior to chlorination and on the chlorinated effluent.

g. Commencement of sample collection per item a, shall be at a time when there is minimal storm drainage inflow to the collection system. A description of the degree of inflow at the time of sample collection shall be provided.

h. All tests results shall be reported as well as the calculated effect levels as prescribed in EPA methods manual along with quarterly Discharge Monitoring Reports.

If the most toxic of the biomonitoring results indicates that the no observed effect level (NOEL) is at a point where the effluent portion is less than 50% of the total test water volume, the permittee may be required to submit a Toxic Reduction Plan. This plan, upon approval by EPA may become an enforceable part of this permit.

ER—BWQ—15.2: Rev. 8/87

DRAFT

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF WATER QUALITY MANAGEMENT

JUL. 22 1992

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM SEWAGE PERMIT NO. PA ~~0026671~~

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 et seq. (the "Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 et seq.,

City of Philadelphia Water Department

is hereby authorized to discharge from the Southwest Water Pollution Control Plant (Point Source 001) and 83 overflow points (Point Sources 002-084) located in the City of Philadelphia, Philadelphia County.

to the receiving waters named Delaware River Zone 4 (Point Source 001); Schuylkill River (Point Sources 002-040 and 073-077); Cobbs Creek (Point Sources 041-072 and 078-084).

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B, and C hereof.

This permit and the authorization to discharge shall expire at midnight _____.

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the standard or special conditions, and the terms and conditions of this permit, the terms and conditions shall apply.

2. Failure to comply with any of the terms or conditions of this permit is grounds for enforcement action; for permit termination, revocation and reissuance or modification; or for denial of a permit renewal application.

3. It is required by law that this permit, before becoming operative, shall be recorded in the Office of the Recorder of Deeds for the county wherein the outlet of said sewer system is located.

4. Application for renewal of this permit, or notification of intent to cease discharging by the expiration date, must be submitted to the Department at least 180 days prior to the above expiration date (unless permission has been granted by the Department for submission at a later date), using the appropriate NPDES Permit Application Form. In the event that a timely and complete application for renewal has been submitted and the Department is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit will be automatically continued and will remain fully effective and enforceable pending the grant or denial of the application for permit renewal.

5. This permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

PERMIT ISSUED BY _____

DATE _____ TITLE Joseph A. Feola

PART A

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I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001; LOCATED AT LATITUDE 75°13'13", LONGITUDE 39°52'08"

A. The Permittee is authorized to discharge during the period from issuance through expiration.
B. The average monthly flow of effluent discharged from the wastewater treatment facility shall not exceed 200 million gallons per day.
C. The quality of effluent shall be limited at all times as specified in Footnote (3) and as follows:

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS		
	MASS UNITS (lbs/day)		CONCENTRATIONS (mg/l)				INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY				
FLOW (a)								Continuous	Recorded	
BOD_5 (b)	21,650	32,475		30	45		60	Daily	24 HC	
BOD_5 % REMOVAL (f)	DRBC Zone 4 Requirement of 89.25%							Daily	24 HC	
SUSPENDED SOLIDS	50,040	75,060		30	45		60	Daily	24 HC	
$CBOD_{20}$ (c)	37,020							2/Week	24 HC	
FECAL COLIFORM (5-1 to 9-30)			See Footnote (2)					Daily	Grab	
FECAL COLIFORM (10-1 to 4-30)			Same Limits as in Footnote (2)					Daily	Grab	
pH (d)	Within Limits of 6 to 9 Standard Units at all times							Daily	Grab	
NH_3-N				Monitor Only	Monitor Only			1/Week	24 HC	
TKN				Monitor Only	Monitor Only			1/Week	24 HC	
NO_3-N				MONITOR ONLY	MONITOR ONLY			1/Week	24 HC	
NO_2-N				MONITOR ONLY	MONITOR ONLY			1/Week	24 HC	

Continued on Page 2a

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS			
	MASS UNITS (lbs/day)		CONCENTRATIONS (mg/l)							
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
ALUMINUM, TOTAL (e)				MONITOR ONLY				1/Month	24 HC	
CHROMIUM, TOTAL (e)				MONITOR ONLY				1/Month	24 HC	
CHROMIUM, HEXAVALENT (e)				MONITOR ONLY				1/Month	Grab	
COPPER (e)				MONITOR ONLY				1/Month	24 HC	
IRON, TOTAL (e)				MONITOR ONLY				1/Month	24 HC	
IRON, DISSOLVED (e)				MONITOR ONLY				1/Month	24 HC	
MANGANESE (e)				MONITOR ONLY				1/Month	24 HC	
SILVER (e)				MONITOR ONLY				1/Month	24 HC	
ZINC (e)				MONITOR ONLY				1/Month	24 HC	
CYANIDE, FREE (e)				MONITOR ONLY				1/Month	24 HC	
TETRACHLOROETHYLENE (e)				MONITOR ONLY				1/Month	Grab	
TOTAL RESIDUAL CHLORINE				MONITOR ONLY				Daily	Grab	

(a) See Paragraph O, Other Requirements (Page 14m of 14)
(b) See Paragraph P, Other Requirements (Page 14m of 14)
(c) $CBOD_{20}$- 20-day Carbonaceous Biochemical Oxygen Demand Test with Nitrogenous Oxygen Demand Inhibited
(d) See Paragraph T, Other Requirements (Page 14v of 14)
(e) See Paragraph H, Other Requirements (Page 14a of 14)
(f) See Paragraph G, Other Requirements (Page 14a of 14)

FOOTNOTES: 1. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): at Outfall 001 at the Pier Effluent Sampling Building.

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I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGE 001; LOCATED AT LATITUDE 75°13'13", LONGITUDE 39°52'08"

A. During the period beginning at issuance and lasting through expiration, the Permittee is authorized to discharge.
B. Based on production data and anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply.

DISCHARGE PARAMETER	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS			
	MASS UNITS (lbs/day)		TUc ****							
	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE ANNUAL	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	INSTANTANEOUS MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE	24 HOUR REPORT UNDER PART A.II.D
WHOLE EFFLUENT TOXICITY - CERIODAPHNIA DUBIA * & **						MONITOR ONLY		QUARTERLY	24 H.C.	
WHOLE EFFLUENT TOXICITY - FATHEAD MINNOW * & ***						MONITOR ONLY		QUARTERLY	24 H.C.	

FOOTNOTES: 1. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfall 001 at the Pier Effluent Sampling Building

* See Paragraph Q, Other Requirements (14m of 14)
** Toxicity monitoring based on the static renewal chronic Ceriodaphnia dubia test reported as a maximum daily result.
*** Toxicity monitoring based on the static renewal chronic Fathead minnow test reported as a maximum daily result.
**** TUc: Chronic Toxicity Units $TUc = \frac{100}{NOEC}$

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A. Effluent limitations, monitoring requirements, and other standard and special conditions which relate to the discharge(s) of pollutants authorized by this permit and which are contained in Water Quality Management Permit(s)

No. 9213S, 766S2 and 5172419 issued on February 27, 1959; April 26, 1966 and October 1, 1972.

are superseded by the terms and conditions of this permit, unless specifically noted otherwise herein.

B. A copy of the Discharge Monitoring Report is to be sent to the following agencies:

Delaware River Basin Commission
P.O. Box 7360
West Trenton, New Jersey 08628

PA Enforcement Branch (3WM51)
U.S. Environmental Protection Agency
841 Chestnut Building
Philadelphia, PA 19107

C. For reporting purposes on the Discharge Monitoring Report, the term "average weekly" shall mean the highest average weekly value observed during the monthly monitoring period.

D. If, in the opinion of the Department, the sewage treatment plant is not so operated or if by reason of change in the character of the waste or increased load upon the sewage treatment plant, or changed use or condition of the receiving body of water, or otherwise, that the effluent ceases to be satisfactory or the sewage treatment plant creates a public nuisance, then upon notice by the Department the right herein granted to discharge such effluent shall cease and become null and void unless within the time specified by the Department, the permittee shall adopt such remedial measures as will produce an effluent which, in the opinion of the Department, will be satisfactory for discharge into the receiving body of water.

E. No storm water from pavements, area ways, roofs, foundation drains or other sources shall be admitted to the separate sanitary sewers associated with the herein approved discharge.

F. The approval herein given is specifically made contingent upon the permittee acquiring all necessary property rights by easement or otherwise, providing for the satisfactory construction, operation, maintenance and replacement of all sewers or sewerage structures associated with the herein approved discharge in, along, or across private property, with full rights of ingress, egress and regress.

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G. The BOD_5 in the raw wastewater shall be reduced by at least 89.25% as a monthly average in accordance with the requirements of the Delaware River Basin Commission for Zone 4 of the Delaware Estuary. The percent removal shall be calculated from daily 24 hour composite samples of the influent and effluent. The influent must reflect true characteristics of the raw wastewater and must not be affected by plant recycle flows. If equivalent $CBOD_5$ effluent limits replace the BOD_5 effluent limits, the percent removal shall be calculated using influent and effluent $CBOD_5$ measurements.

The BOD_5 percent removal requirement will be relaxed to 86% when the influent BOD_5 concentration is less than 110 mg/l on a monthly average basis so long as the $CBOD_{20}$ allocation, equivalent mass BOD_5 limitation and an effluent BOD_5 concentration of 15 mg/l are not exceeded on a monthly average basis. If equivalent $CBOD_5$ effluent limits replace the BOD_5 effluent limits, the above percent removal requirements shall apply to $CBOD_5$ and the 110 mg/l and 15 mg/l BOD_5 concentrations shall be converted to equivalent $CBOD_5$ concentrations based on the ratio of monthly average $CBOD_5$ to BOD_5 mass effluent limitations.

H. Analysis for the following pollutant(s) shall be performed using the following test method(s) contained in 40 CFR Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants, or any approved test method(s) of equal or greater sensitivity.

Parameter	Test Method
Aluminum, Total	EPA Method 210.1 (AA, Flame)
Chromium, Total	EPA Method 218.1 (AA, Flame)
Chromium, Hexavalent	EPA Method 218.4 (AA, Extraction)
Copper	EPA Method 220.2 (AA, Furnace)
Iron, Total	EPA Method 236.1 (AA, Direct)
Iron, Dissolved	EPA Method 236.1 (AA, Direct)
Manganese	EPA Method 242.1 (AA, Flame)
Silver	EPA Method 272.2 (AA, Furnace)
Zinc	EPA Method 289.1 (AA, Flame)
Cyanide, Free	DER Method (See Attached)
Tetrachloroethylene	EPA Method 601 (GC/Hal.)

I. The following requirements shall apply with regard to implementation of the required industrial pretreatment program.

(1) The permittee shall operate an industrial pretreatment program in accordance with the Clean Water Act and the General Pretreatment Regulations (40 C.F.R. 403). The program shall also be implemented in accordance with the approved and/or modified POTW pretreatment program submitted by the permittee.

(2) The permittee shall submit all changes, and obtain approval of all substantial changes, in its approved pretreatment program in accordance with 40 C.F.R. 403.18.

(3) The permittee's implementation of its pretreatment program shall, at a minimum, meet the requirements listed below. Where the approved program requires more stringent or more frequent

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(a) The permittee shall provide written notice of applicable pretreatment requirements to all industrial users. For significant industrial users (SIUs) such written notice shall be through individual discharge permits or other equivalent control mechanism in accordance with 40 C.F.R. 403.8(f). All SIU control mechanisms shall be in place within 6 months of program approval and shall not be issued for a period which exceeds 5 years. SIU control mechanisms shall be reissued within 3 months of expiration, and administrative extensions shall not be granted without written consent from the Approval Authority.

(b) Each SIU shall be sampled by the permittee at least once per year. Such sampling shall include all regulated parameters.

(c) Each SIU shall be inspected by the permittee at least once per year. Such inspection shall cover all areas which could result in wastewater discharge to the sewer including manufacturing areas, chemical storage areas, pretreatment facilities, spill prevention and control procedures, hazardous waste generation, and industrial self-monitoring procedures and records.

(d) The permittee shall implement the industrial reporting requirements of 40 C.F.R. 403.12.

(e) The permittee shall develop and obtain Approval Authority approval of a written enforcement response plan (ERP) within 6 months of permit issuance. The ERP shall indicate how instances of violation will be investigated, what enforcement options are available to the POTW, contain a listing of potential industrial violations, and state the type of action and time frame for the permittee's enforcement for each violation. Where approval of the ERP has been previously granted, the permittee shall reevaluate its ERP and submit the results of the re-evaluation and a revised ERP within 6 months of permit issuance.

(f) The permittee shall take timely and appropriate enforcement in accordance with its approved ERP for all instances of industrial violations.

(g) The permittee shall submit, to the Approval Authority, a re-evaluation of its local limits based on a headworks analysis of its treatment plant within 1 year of permit issuance. At a minimum, the headworks analysis shall include arsenic, cadmium, chromium, copper, cyanide (T) lead,

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mercury, nickel, silver, zinc, any parameter limited by this permit or sludge disposal requirements, and any other pollutant which the permittee or approval authority believes may be discharged by its industries in amounts which may cause pass-through or interference. The list of pollutants to be evaluated shall be submitted within 3 months of permit issuance.

(h) The permittee shall conduct monitoring at its treatment plant based on its permitted flows, as follows:

i) > 20 MGD - monthly influent, effluent and sludge analysis for all local limit parameters, semi-annual priority pollutant scan for influent and sludge.

ii) > 5-20 MGD - monthly influent, effluent and sludge analysis for all local limit parameters, annual priority pollutant scan for influent and sludge.

iii) > 1-5 MGD - quarterly influent, effluent and sludge analysis for all local limit parameters, annual priority pollutant scan for influent and sludge.

iv) < 1 MGD - annual influent, effluent and sludge analysis for all local limit parameters, priority pollutant scan for influent and sludge within 1 year.

(i) The permittee shall ensure that adequate resources are available (equipment and personnel) to fully implement the pretreatment program.

(4) EPA and DER retain the right to require the permittee to institute changes to its pretreatment program if:

(a) the program is not implemented in a way satisfying the requirements of 40 C.F.R. 403;

(b) problems such as interference, pass-through or sludge contamination develop or continue;

(c) Federal, State, or local requirements change.

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(5) By March 31 of each year, the permittee shall submit to EPA and DER an annual report that describes the permittee's pretreatment activities for the previous calendar year. The annual report shall include pretreatment activities in all municipalities from which wastewater is received at the permittee's treatment plant. The submission to DER shall be incorporated into the permittee's annual Municipal Wasteload Management report required by DER's Chapter 94 Rules and Regulations. The annual report shall include the following:

(a) Control Mechanism Issuance - a summary of SIU control mechanism issuance including a list of issuance and expiration dates of each SIU.

(b) Sampling and Inspection - a summary of the number and type of inspections and samplings of SIUs by the permittee, including a list of all SIUs either not sampled or not inspected.

(c) Industrial User Compliance and POTW Enforcement - a summary of the number and type of violations of pretreatment regulations and the actions taken by the permittee to obtain compliance. For each SIU, the report shall say whether the user was in significant noncompliance under 40 C.F.R. 403.8, infrequent (non-significant) noncompliance, or in compliance for the entire year. A copy of the published list of facilities in significant noncompliance shall be included.

(d) Industrial Listing - an updated industrial listing showing all current SIUs and the categorical standard, if any, applicable to each.

(e) Summary of POTW Operations - any interference upset, or permit violations experienced at the POTW which may be attributed to industrial users, and actions taken to alleviate said events. Sampling and analysis of treatment plant influent and sludge for toxic and incompatible pollutants shall also be included with an analysis of any trends in the data since pretreatment program approval.

(f) Pretreatment Program Changes - a summary of any changes to the approved program and the date of submission to the Approval Authority.

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J. The permittee will ensure that applied chlorine dosages, used for disinfection or other purposes, are optimized to the degree necessary such that the total residual chlorine (TRC) in the discharge effluent does not cause an adverse stream impact. In doing so, the permittee shall consider relevant factors affecting required chlorine dosage, such as wastewater characteristics, mixing and contact times, desired result of chlorination, and expected impact on the receiving water body. The TRC data shall be recorded daily and maintained at the facility. For municipal facilities the data shall be summarized annually as part of the Chapter 94 - Municipal Wasteload Management Report.

If the Department determines or receives documented evidence that levels of TRC in the permittee's effluent are causing adverse water quality impacts in the receiving water, the permittee shall be required to institute necessary additional steps to reduce or eliminate such impact.

K. Collected screenings, slurries, sludges, and other solids shall be handled and disposed of in compliance with 25 Pa. Code, Chapters 271, 273, 275, 283,and 285 (relating to permits and requirements for landfilling, land application, incineration, and storage of sewage sludge), Federal Regulation 40 CFR 257, and the Federal Clean Water Act and its amendments.

L. The Department may identify and require certain discharge specific data to be submitted before the expiration date of this permit. Upon notification by the Department, the permittee will have 12 months from the date of the notice to provide the required data. These data, along with any other data available to the Department, will be used in completing the Watershed TMDL/WLA Analysis and in establishing discharge effluent limits.

M. Combined Sewer Overflows

Point Sources 002 through 084 (listed below) serve as combined sewer reliefs necessitated by stormwater entering the sewer system and exceeding the hydraulic capacity of the sewers and/or the treatment plant. Combined sewer overflows (CSO) are allowed only when flows in combined sewers exceed conveyance or treatment capacities during wet weather periods. Dry weather overflows are prohibited. CSOs are point source discharges which must be provided technology-based control measures in accordance with the Clean Water Act. Additional control measures will also have to be provided if determined necessary to comply with water quality standards. At a minimum, technology-based control measures must include best management practices and/or other non-capital intensive measures to minimize discharges and water quality impacts.

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Schuylkill River

Lower Schuylkill East Side

Point Source	Interceptor Regulator Name	Longitude	Latitude
002	Reed St. & Schuylkill Ave (S31)	75°12'18"	40°56'17"
003	34th St. & Mifflin Sts. (S36A)	75°12'25"	39°55'55"
004	Vare Avenue & 29th St. (S-37)	75°12'37"	39°55'41"
005	Passyunk Ave. & 29th St. (S-42)	75°12'05"	39°55'11"
006	Passyunk Ave. & 28th St. (S-42A)	75°12'05"	39°55'11"
007	26th St. 700' N of Hartranft St. (S-44)	75°12'13"	39°54'53"
008	Penrose Ave. & 26th St. (S-46)	75°12'40"	39°53'54"

Central Schuylkill East Side

009	24th St. 155' S of Parktowne Place (S-5)	75°10'49"	39°57'41"
010	24th St. 350' S of Parktowne Place (S-6)	75°10'50'	39°57'39"
011	24th St E. of Schuylkill River (S-7)	75°10'47"	39°57'37"
012	Race St & Bonsall St. (S-8)	75°10'45"	39°57'30"
013	Arch St. W. of 23rd St. (S-9)	75°10'46"	39°57'24"
014	Market St. 25' E. of 24th St. (S-10)	75°10'48"	39°57'16"
015	Chestnut St. & 24th St. (S-12A)	75°10'50"	39°57'11"
016	Sansom St. W. of 24th St. (S-13)	75°13'52"	39°57'08"
017	Walnut St. W. of 24th St. (S-15)	75°10'54"	39°57'05"
018	Locust St. & 25th St. (S-16)	75°10'56"	39°57'00"
019	Spruce St. & 25th St. (S-17)	75°11'00"	39°56'57"
020	Pine St. W of Taney St. (S-18)	75°11'06"	39°56'53"
021	Lombard St. W. of 27th St. (S-19)	75°11'09"	39°56'52"
022	South St. E. of 27th St. (S-21)	75°11'12"	39°56'48"
023	Schuylkill Ave. & Bainbridge St. (S-23)	75°11'17"	39°56'45"

Point Source	Interceptor Regulator Name	Longitude	Latitude
024	Schuylkill Ave. & Christian St. (S-25)	75°11'28"	39°56'36"
025	Ellsworth St. W. of Schuylkill Ave. (S-26)	75°11'35"	39°56'30"

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	Central Schuylkill Interceptor Central Schuylkill West Side		
026	Mantua Ave. & West River Drive (S-1)	75°11'17"	39°58'02"
027	Haverford Ave. & West River Drive (S-2)	75°11'06"	39°57'54"
028	Spring Garden St. W. of Schuylkill Expressway (S-3)	75°11'04"	39°57'53"
029	Powelton Ave. W. of Schuylkill Expressway (S-4)	75°10'56"	39°57'42"
030	Market St. in the PRR Baggage Rm (S-11)	75°10'53"	39°57'17"
031	Schuylkill Expressway and Walnut St. Bridge (S-14)	75°10'58"	39°57'05"
032	440 Ft. N. W. of South St. PRR Property (S-20)	75°11'12"	39°56'52"
033	660 Ft. S. of South St. E. of Pennfield (S-22)	75°11'22"	39°56'43"
034	1,060 Ft. S. of South St. E. of Pennfield (S-24)	75°11'26"	39°56'43"
	Southwest Main Gravity		
035	46th St. & Paschall Ave. (S-30)	75°12'23"	39°56'31"
036	43rd St. S.E. of Woodland Ave. (S-50)	75°12'18"	39°56'36"
077	42nd St. S.E. of Woodland Ave. (S-51)	75°12'18"	39°56'36"
	Lower Schuylkill West Side		
037	49th St. S. of Botanic St. (S-32)	75°12'23"	39°56'14"
038	51st ST. and Botanic St. (S-33)	75°12'23"	39°56'08"
039	56th St. E. of P&R Railroad (S-38)	75°12'49"	39°55'43"
040	67th St. E. of P&R Railroad (S-45)	75°12'58"	39°54'29"
	Discharge to Cobbs Creek Cobbs Creek Low Level		
041	60th St. & Cobbs Creek Parkway (C-18)	75°14'08"	39°56'11"
042	Mount Moriah Cemetary & 62nd St. (C-19)	75°14'19"	39°55'57"
043	65th St. & Cobbs Creek Parkway (C-20)	75°14'39"	39°55'46"
044	68th St. & Cobbs Creek Parkway (C-21)	75°15'40"	39°55'38"
045	70th St. & Cobbs Creek Parkway (C-22)	75°14'46"	39°55'27"
046	Upland St. & Cobbs Creek Parkway (C-23)	75°14'52"	39°55'14"
047	Woodland Ave. E. of Island Ave. (C-25)	75°14'51"	39°55'00"

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Point Source	Interceptor Regulator Name	Longitude	Latitude
048	75th St. & Grays Ave. (C-28)	75°14'55"	39°54'45"
078	Island Ave. S. E. of Glenmore Ave. (C-28A)	75°14'58"	39°54'60"
049	Claymont St. & Grays Ave. (C-29)	75°14'56"	39°54'75"
050	77th St. W. of Elmwood Ave. (C-30)	75°15'02"	39°54'34"
079	Saybrook Ave. & Island Ave. (C-26)	75°14'51"	39°55'00"
	Cobbs Creek High Level		
051	City Line Ave. & 73rd St. (C-1)	75°16'04"	39°58'51"
052	City Line Ave. 100 Ft. South Side of Creek (C-2)	75°16'02"	39°58'51"
053	Malvern Ave. & 68th St. (C-4)	75°15'28"	39°58'39"
054	Lebanon Ave. S. W. of 73rd St. (C-5)	75°15'26"	39°58'31"
055	Lebanon Ave. & 68th St. (C-6)	75°15'26"	39°58'31"
056	Lansdowne Ave. & 69th St. (C-7)	75°15'26"	39°58'27"
080	Paschall Ave. & Island Ave. (C-27)	75°14'51"	39°55'00"
081	Greenway Ave. & Cobbs Creek Parkway (C-24)	75°14'51"	39°55'00"
057	64th St. & Cobbs Creek (C-9)	75°14'57"	39°57'52"
058	Gross St. & Cobbs Creek (C-10)	75°14'53"	39°57'50"
059	Cobbs Creek Parkway S. of Market St. (C-11)	75°14'54"	39°57'43"
060	Spruce St. & Cobbs Creek (C-12)	75°14'59"	39°57'26"
061	62nd St. & Cobbs Creek (C-13)	75°14'57"	39°56'56"
062	Baltimore Ave. & Cobbs Creek (C-14)	75°14'50"	39°56'44"
063	59th St. & Cobbs Creek Parkway (C-15)	75°14'26"	39°56'32"
064	Thomas Ave. & Cobbs Creek (C-16)	75°14'22"	39°56'27"
065	Beaumont St. & Cobbs Creek (C-17)	75°14'06"	39°56'15"
066	Cobbs Creek Parkway S. of City Line Ave. (C-31)	75°16'50"	39°28'29"
067	Brockton Rd. & Farrington Rd. (C-33)	75°15'55"	39°38'13"
068	Woodcrest Ave. & Morris Park (C-34)	75°15'43"	39°58'41"
069	Morris Park W. of 72nd St. and Sherwood Rd. (C-35)	75°15'55"	39°58'46"
070	Woodbine Ave. S. of Brentwood Rd. (C-36)	75°15'33"	39°57'55"
071	Cobbs Creek Parkway S. of 67th St. and Callowhill St. (C-37)	75°15'15"	39°57'55"
072	Cobbs Creek Parkway & 77th St. (C-32)	75°16'12"	39°58'21"
082	Malvern Ave. N.W. of 68th St. (C-4A)	75°15'28"	39°58'39"
083	Thomas Run Relief Sewer - Cobbs Creek Parkway W. of Ashland St.	75°14'24"	39°56'29"
084	Arch St. Relief Sewer - Arch St. and Cobbs Creek	75°14'53"	39°57'48"

PART C

OTHER REQUIREMENTS

Discharges to Schuylkill River
Lower Schuylkill East Side

073	35th St. & Mifflin St. (S-35)	75°12'25"	39°55'55"
074	36th St. & Mifflin St. (S-36)	75°12'25"	39°55'55"

Central Schuylkill East Side

Point Source	Interceptor Regulator Name	Longitude	Latitude
075	Main Relief Sewer - S. of Fairmount Ave. and Schuylkill River	75°11'01"	39°58'10"
076	24th St. N. of Chestnut St. Bridge (S-12)	75°10'50"	39°57'11"

1. MINIMUM TECHNOLOGY-BASED CONTROL MEASURES - PLAN OF ACTION

The permittee shall complete and implement a Minimum Technology-based Plan of Action for identification and minimization of all CSO discharges according to the following schedule:

Permit Issuance Date (PID)

Description of Activity	Due Date (Actual date to be entered at issuance)
Submit a conceptual plan to state and EPA, Region III, (3WM53)	PID + 4 months
State approval/modification of conceptual plan	PID + 6 months
Submittal of final plan to State and EPA, Region III including implementation plan and schedule	PID + 12 months
Completion of Plan recommendations final report to State and EPA, Region III	PID + 38 months

The Minimum Technology-based Limitation Plan of Action shall address at a minimum, the following measures:

a. Identification of Combined Sewer Overflows. Review and update the CSO discharge points listed above. For each CSO indicate the following measures:

i. latitude and longitude of the CSO discharge point and associated regulator mechanism.

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ii. A narrative description of the location of the CSO point and regulator mechanism with respect to direction and distance from street intersections.

iii. A location map (U.S.G.S. Topographic Quadrangle) with the location of the CSO point and associated regulator mechanism indicated.

iv. A description of the size and type of regulator mechanism, including engineering drawing.

v. A description of the size and type of outfall structure.

vi. A determination of whether the outfall structure is submerged, partially submerged or not submerged during times of critical condition by the receiving water.

vii. Verification of the presence or absence of a backflow prevention device on the CSO.

viii. Name of the receiving water.

ix. Development of a visual identification system on all CSO outfalls, by visually labeling the outfall pipe with a numbering system, submerged outfalls shall be identified at the nearest manhole/bulkhead.

x. Identification of CSOs near drinking water intakes, recreation areas, or unique ecological habitats.

xi. Identification of any continuous or chronic dry weather overflows.

b. System Inventory

The plan shall identify all overflow points, control structures, sewer sizes and control structure dimensions, industrial contributors and key hydraulic monitoring control points. The inventory shall include system maps, hydraulic analyses and flow measurements. Characterization of all overflows in terms of both frequency, quantity and quality; identification of the intensity and duration of the storm event that triggers an overflow.

Volume discharge from each overflow for various size storms, and number of events and total volume discharged per year based on historical rainfall records.

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c. Operational Status and Assessment

Summarize the current operation status, control measures, and functional adequacy of all CSOs. A comprehensive engineering assessment of the operational status and condition of all portions of the CSO treatment works based on actual field verification/inspection records shall be included. Information on the determination of whether the sewers are cracked, depressed, or of questionable physical integrity, observances of the presence of flow restrictions due to excessive sludge or grease build-up, or other conditions, and an assessment of each regulator's and/or tide gate's operability and reliability. All dry weather overflows are prohibited.

Based upon the results of the engineering inspection and assessment, the report shall include a prioritized list, strategy and schedule for rehabilitating the system and bringing it into optimal operating condition. A prioritized list for correction of any continuous dry weather overflows with schedule shall also be included.

d. Inspection and Maintenance

Summarize the regular inspection and maintenance of the combined sewer system including regulators to ensure that (1) deposition of solids does not cause obstructions which result in overflows; (2) continuous dry weather discharges are not occurring, and (3) regulators are in good working order and adjusted to minimize overflows. Identify response time between initial dry weather CSO discharge and corrective action; include a plan to reduce response time. The permittee shall submit as part of the plan of action, a written Operation and Maintenance (O&M) Plan designed to ensure the above items.

e. High Flow Management

Development of a high flow management plan which (1) maximizes the capacity of the combined sewer system for storage without causing backup or surcharge problems, and (2) enables a maximum amount of flow to be conveyed to the treatment plant without upsetting normal plant operations. Measures to be evaluated should include raising existing overflow weir levels and possible utilization of primary settling facilities for treatment if sufficient excess capacity is available, and automatic regulator and computerized control system.

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f. Ordinance Revisions

Modification of the sewer ordinance where necessary to ensure prohibitions of (1) dry weather overflows, (2) construction of new combined sewers, except where sewer separation is infeasible (3) inflow sources in sanitary sewer tributary to the combined system, and (4) dumping or motor oil and excessive grease into the sewer system.

g. Source Reduction

Minimization of discharges of solids and floating materials by (1) regular cleaning of streets and catch basins, (2) installation of screens on CSOs, particularly those discharging to estuary waters, (3) reduction of infiltration/inflow where feasible.

h. Pretreatment Program

Review impact of Industrial Users toxics, BOD, and total suspended solids load to CSO overflows; review and modify pretreatment programs to assure CSO impacts are minimized.

i. Minimization of CSOs near sensitive areas

Examine elimination or minimization of CSO discharges near drinking water intakes, recreation areas, or unique ecological habitats.

2. WATER QUALITY IMPACTS - PLAN OF ACTION

A water quality impact plan of action for CSOs shall be based upon the results of the Delaware River Basin Commission (DRBC) CSO Comprehensive Study of the Delaware Estuary, currently underway. The permittee shall provide any monitoring data or other information requested by DRBC for the study.

The permittee shall submit a plan of action which sets forth an implementation plan and schedule to address the conclusions and recommendations of the DRBC study within 12 months after DRBC study completion.

If the DRBC study is not completed in a timely manner, the permittee will be required to conduct a CSO water quality impact study. Additional guidance and schedule will be provided by the Department.

3. REPORTING REQUIREMENTS

The permittee shall submit semi-annual (January 1, July 1) status reports to the Department and EPA, Region III (3WM53) on the development of the Minimum Technology-based control measures plan of action, implementation of the Minimum Technology-based control measures Plan, and development of the water quality plan.

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Each priority CSO overflow point, as identified by an asterisk on the CSOs listed above, shall be monitored for cause, frequency, duration and quantity of flow. All monitoring data shall be recorded and submitted monthly in the format specified by the Department (attached) and shall be summarized annually with the facility's Chapter 94 Wasteload Management Report.

Annual CSO Status Report

The annual CSO status report shall be submitted with the Chapter 94 - "Municipal Wasteload Management Report". The report shall provide a summary of the frequency, duration, and volume of the CSOs for the past calendar year, operational status of major overflow points and identification of known/potential instream water quality impacts and their causes. The annual report shall also summarize all actions taken and their effectiveness in implementing the approved Plans of action, and shall evaluate and provide necessary revisions to the plans approved by the Department.

N. The permittee shall operate the sewage treatment plant to provide treatment for the maximum design wastewater flows of 300 mgd (maximum daily average) and 400 mgd (peak) without causing treatment plant upsets. Throttling of influent flows to the plant resulting in avoidable, premature sewer system overflows in prohibited.

O. An average monthly flow in excess of 200 mgd shall not be considered to be a violation of this permit.

P. An application may be made to the Delaware River Basin Commission to establish alternate/equivalent $CBOD_5$ effluent mass and concentration limits to replace the BOD_5 effluent limits in this permit. Upon establishment of such limits by the Commission, the BOD_5 limits shall cease to be in effect and the $CBOD_5$ limits established by the Commission shall become effective.

Q. Biomonitoring

I. General Requirements.

The permittee shall conduct acceptable toxicity tests in accordance with the appropriate test protocols described in Section V. Test Conditions and Methods. The permittee must collect discharge samples and perform the toxicity tests to generate chronic Ceriodaphnia dubia and fathead minnow (Pimephales promelas) test results (NOEC's) which will also enable a determination of the acute (LC50) value at the 48 hour interval. For purpose of reporting, all NOEC's shall be converted to TUc's by the following equation:

$$TUc = \frac{100}{NOEC}$$

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In addition all LC50 values shall be converted to TUa's by following equation:

$$TUa = \frac{100}{LC50}$$

Within sixty (60) days of the effective date of the NPDES permit, the permittee shall submit to the Department of Environmental Resources (DER) and the Environmental Protection Agency (EPA), Region III an acceptable plan of study for determining the chronic toxicity of wastewater discharged from outfall(s) 001 through the use of whole effluent toxicity testing (biomonitoring). If DER and EPA comment on the plan, the permittee shall make any modifications requested. If the Department and EPA do not comment on the plan within thirty (30) days of submission, the permittee shall begin the whole effluent toxicity testing program as outlined in the study plan.

At a minimum the study plan should include a discussion of:

--wastewater and production variability

--source of test organisms

--source of dilution water

--test conditions

--sampling methods

--quality assurance/quality control information (including reference toxicity results and any deviations from recommended procedures).

II. Test Frequency.

Static renewal chronic testing shall be conducted on a quarterly basis (four times per year) beginning within thirty (30) days of submission of the biomonitoring study plan, provided that the Department and EPA do not comment on the plan and request modifications within the thirty (30) day period.

Two species shall be tested, the cladoceran Ceriodaphnia dubia for survival and reproduction and the fathead minnow Pimephales promelas for survival and growth. The two species must be tested each quarter, for a total of eight tests. Additional test species may be included, based on effluent characteristics, or as methods are developed.

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III. Sample Collection.

For each sampling event, three, twenty-four (24) hour discharge composite samples collected at a frequency of not greater than every two hours and flow proportioned shall be collected over a seven (7) day exposure period. The initial sample taken on day 0 is used to start the test on day 1. The additional two samples are collected on day 2 and 4 to be used on day 3 and 5, respectively. Renewal of test concentrations is conducted daily with the most recently collected discharge sample.

For effluents that are chlorinated, test shall be conducted on a final effluent sample that has been dechlorinated. Dechlorinated samples will consist of the final effluent composites treated with sodium thiosulfate (see Section 7.4 of Weber, C.I, etal (ed). 1989. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms).

All samples held overnight shall be refrigerated at 4°C.

IV. Dilution Water.

The dilution water source must consist of either moderately hard synthetic water (using either Millipore Milli-QR or equivalent deionized water and reagent grade chemicals) or deionized water (80%) combined with Perrier or chemically equivalent mineral water (20%).

V. Test Conditions and Methods.

The test conditions and methods shall conform to those developed by EPA as specified in the documents cited below. If DER or EPA determine that the proper test conditions have not been followed or if the test acceptability criteria are not met, the permittee must perform a re-test within thirty (30) days.

Weber, C.I. et al. (ed.). 1989. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water To Freshwater Organisms. Second Edition. Office of Research and Development, Cincinnati, OH. EPA/600/4-89/001.

Weber, C.I. (ed) 1991. Methods for Measuring the Acute Toxicity of Effluents and receiving water to Freshwater and Marine Organisms, Fourth Edition. Office of Research and Development, Cincinnati, OH. EPA/600/4-90/027.

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U.S. Environmental Protection Agency. 1991. Technical Support Document for Water Quality-based Toxics Control. Office of Water, Washington, DC EPA/505/2-90-001.

A. Summary of effluent toxicity test conditions and test acceptability criteria for the Ceriodaphnia dubia survival and reproduction test (adapted from EPA/600/4-89/001).

1. Renewal of test solutions:	Daily using most recently collected sample.
2. Effluent concentrations:	5 concentrations and a control. An additional control (0% effluent) treated with the same concentration of sodium thiosulfate as used to dechlorinate the effluent sample will be run. If the initial sample has no chlorine present, start the additional control with no sodium thiosulfate.
3. Dilution factor:	0.5
4. Test duration:	Until 60% of control animals have three broods (7 days or less)
5. Sampling Requirements:	A minimum of three samples are collected to be used on days 1, 3, and 5 for renewal. Test samples must be first used within 36 hours of collection.
6. Sample volume required:	Minimum of 1 liter per day
7. Test acceptability criterion:	80% or greater survival and an average of 15 or more young per surviving animal in the control solutions. At least 60% of the surviving animals in controls must have produced their third brood in seven days or less.

B. Summary of effluent toxicity test conditions and test acceptability criteria for the fathead minnow (Pimephales promelas) survival and reproduction test (adapted from EPA/600/4-89/001).

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1. Test chamber size:	250-1000 ml
2. Test solution volume:	200 ml/replicate (minimum)
3. No. of larvae per test chamber:	10
4. No. of replicate test chambers per concentration:	4
5. No. of larvae per test concentration:	40
6. Feeding regime:	Feed 0.1 ml newly hatched brine shrimp nauplii (less than 24 hours old) twice daily at 6 hour intervals (at the beginning of the work day prior to renewal, and at the end of the work day following renewal). Sufficient nauplii are added to provide an excess. Larvae are not fed during the final 12 hours of the test.
7. Effluent concentrations, Dilution series, Sampling requirements, and Renewal of test solution:	Same as Section V. Test Conditions and Methods Par A, summary of effluent toxicity test conditions and test acceptability criteria for the Ceriodaphnia dubia survival and reporduction test.
8. Sample volume required:	Minimum of 2.5 Liters per day.

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VI. Chemicals Analyses.

Chemical analysis shall be performed for each sampling and testing events as described below.

A. The following chemical analysis shall be performed for each sampling event, including each new batch of dilution water:

Parameter	Effluent	Diluent	Detection Limit (mg/L)
Hardness	X	X	0.5
Alkalinity	X	X	2.0
pH	X	X	-
Specific conductance	X	X	-
Total Residual Chlorine	X		0.02

B. The following chemical analyses shall be performed as part of each daily renewal procedure on each dilution and the controls.

Parameter	Effluent	Diluent
Dissolved oxygen	X	X
Temperature	X	X
pH	X	X
Specific Conductance	X	X

In addition to the chemical analysis required above, those parameters listed in Part A of the NPDES permit for the outfall(s) 001 tested will be analyzed on at least the initial (day 0) sample by using the method specified in the NPDES permit or, if not specified, by EPA and DER (Chapter 16, Water Quality Toxics Management Strategy) approved methods.

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VII Toxicity Test Report Elements.

The following must be reported:

-- description of sample collection procedures and of the sample location.

-- names of individuals collecting and transporting samples, times and dates of sample collection and analysis.

-- general test description: origin and age of test organisms, dates and results of reference toxicant tests; light and temperature regimes; other information on test conditions is listed in Section V. Test Conditions and Methods.

-- all chemical and physical data generated (include detection limits).

-- copies of raw data sheets and/or bench sheets.

-- dechlorination procedure(s).

-- any other observations or test conditions affecting the test outcome.

Toxicity test data that is required includes the following:

-- comparison of performance of controls with test acceptability criteria.

-- daily survival of test organisms in the controls and all replicates for each dilution. Survival data should be analyzed by Fisher's exact test prior to analysis of reproduction data.

-- NOEC: No Observed Effect Concentration.

-- LOEC: Lowest Observed Effect Concentration.

-- chronic value (ChV): Geometric mean of the NOEC and LOEC.

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-- acute endpoints shall be derived from data obtained 48 hours into the chronic test. Survival data for each concentration and replication at 24 hours and 48 hours shall be obtained. LC50 and 95% confidence limits shall be calculated using the following methods: binomial, moving average, moving average-angle, probit, trimmed Spearman-Karber, or the graphical method (EPA/600/4-85/013). All printouts or copies of hand calculations must be submitted. The probit, trimmed Spearman-Karber, and moving average-angle methods can only be used when at least two test concentrations exhibit some (but not all) test organism mortality (partial mortality). If a test results in a 100% survival in one test concentration, and 100% mortality in an adjacent concentration (an "all or nothing" effect), and LC50 value can be estimated using the graphical method.

Chronic reference toxicant test, on both species, shall be conducted monthly in laboratories that maintain their own culturing facilities, while laboratories that secure test organisms from outside suppliers shall conduct chronic reference toxicant test on each separate batch of test organisms. These test shall be conducted similarly to the effluent toxicity test (same dilution water, test organisms and conditions, chemical analyses, etc.) and shall follow guidelines put forth in EPA/600/4-89/001. The reference toxicant shall be a commonly used toxicant approved by the EPA. Reports of reference toxicant tests shall include all information needed for the proper evaluation of the test, including (but not limited to) the following:

-- Water chemistry parameters of controls and test concentrations.

-- Chronic and if applicable, acute endpoint(s), with appropriate statistical analyses.

-- Control charts (for point estimates, cumulative mean + two standards deviations; for NOEC's central tendency + one concentration interval).

VIII Reporting.

Signed copies of each toxicity test's data/reports shall be submitted to DER and EPA at the addresses listed below within thirty (30) days of test completion, so that each individual test result can be reviewed and evaluated for content and performance prior to the initiation of the succeeding quarterly test.

If after review of test data, EPA or the Department may instruct the city to make appropriate changes in the test procedures.

OTHER REQUIREMENTS

U.S. Environmental Protection Agency, Region III
PA/DC Permit Section, 3WM53
841 Chestnut Building
Philadelphia, PA 19107

Pennsylvania Department of Environmental Resources
Bureau of Water Quality Management
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

R. This permit may be reopened to incorporate the requirements or recommendations resulting from the Estuary Toxics Study being conducted by the Delaware River Basin Commission.

S. Chlorine Minimization

The permittee shall implement the Chlorine Minimization Plan submitted to EPA April 2, 1991 according to the following schedule:

Permit Issuance Date (PID)

Description of Activity	Due Date (Actual dates to be entered at issuance)
Chemical and Toxicity Evaluation	PID + 12 months
Determination of minimal chlorine dose necessary to achieve fecal coliform level of <200 MPN/100ml.	
Evaluation of toxicity of samples using minimal chlorine dosage and the minimal dosage plus a margin of safety.	
Evaluation of toxicity of dechlorinated post chlorinated effluent.	
Chemical evaluation of chlorinated and dechlorinated effluent.	
Engineering evaluation of facility's ability to reduce effluent toxicity by maintaining minimum chlorine dose or dechlorination of effluent.	PID + 15 months

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Evaluate whether an alternative disinfection system or modification of existing chlorination system should be used.	PID + 20 months
Selection of control option	PID + 26 months
Implementation of selected option	PID + 38 months

T. An excursion of the lower pH limitation in the effluent, resulting from the use of the Oxygen Activated Sludge process, shall not be considered as a violation of this permit provided that the excursion frequency does not exceed 2.0% of the time on an annual basis and the pH is not less than 5.5 Standard Units.

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APPENDIX I

Water Pollution Control Plants Exceedances

Northeast Water Pollution Control Plant Exceedances

NEWPCP NPDES PERMIT EXCEEDANCES

Date	Discharge Parameter	Permit Level	Exceedance Value	Corrective Actions/Comments
3/07/92 3/10/92 3/19/92	Suspended Solids Daily Maximum	60 mg/l	126 mg/l 69 mg/l 99 mg/l	A bundle of RBC media had broken off of an RBC and migrated to the secondary clarifiers, impeding flow and causing a hydraulic imbalance. The pieces of RBC media were removed on a daily basis from the tank influent channels. The exceedances occurred during rain events.
12/03/91	Daily Maximum Flow	315 MGD	379.47 MGD	A storm event caused the daily maximum flow to be exceeded. No damage to the plant occurred and all other effluent parameters were in compliance.
11/22/91	Daily Maximum Flow	315 MGD	322.77 MGD	A storm event caused the daily maximum flow to be exceeded. No damage to the plant occurred and all other effluent parameters were in compliance.
9/12/91	Daily Maximum Fecal Coliform	200/100 ml	1600/100 ml	The plant ran out of chlorine for disinfection of the effluent at 7:30 a.m. Chlorine was delivered and disinfection restarted at 9:00 p.m.
6/20/91	Combined Sewer Overflow	No Discharge until Plant reaches maximum capacity	Overflow Discharge	The PTB operator took an hourly elevation reading and left the area to perform maintenance operations. Upon returning for the next reading, the overflow elevation was exceeded due to an intense rain. Pumping was immediately increased to lower the elevation and cease the discharge. Pump controls were scheduled to be automated.

TABLE 4.1-3 (Continued)

Date	Discharge Parameter	Permit Level	Exceedance Value	Corrective Actions/Comments
10/19-21 & 23/91	Daily Maximum Fecal Coliform	200/100 ml	1600/100 ml	The south chlorine contact chamber was placed in service after repairs to the chlorine solution line were made on October 19th. Exceedances of the fecal coliform limit occurred on the 19th through the 21st. Subsequent adjustments to the line fixed the problem on the 22nd. The exceedance on the 23rd is not readily understood but compliance was achieved and maintained.
8/13-14,16,18/1990	Daily Maximum Fecal Coliform	200/100 ml	1600/100 ml	It has been surmised that these exceedances were caused by utilization of contaminated collection bottles during sample collection. The problem ceased when a new batch of properly cleaned bottles was used.
8/11/90	Combined Sewer Overflow	No Discharge until Plant reaches Maximum Capacity	Overflow Discharge	The screw conveyor on the #3 grit basin failed and the #2 grit basin was unavailable. Flows through the plant had to be throttled until repairs to the #3 screw conveyor were completed. The flow was throttled for a total of 8 hours. A rain occurrence also influenced the flow to the plant.
8/27/90	Combined Sewer Overflow	No Discharge until Plan reaches Maximum Capacity	Overflow Discharge	The screw conveyor on the #3 grit basin failed and had to be back flushed. The flow to all grit basins had to be reduced to prevent overflow to #3 to accomplish the back flushing. The flow was throttled for a total of 3 hours. A rain occurrence also influenced the flow to the plant.
7/2 & 13/90	Combined Sewer Overflow	No Discharge until Plant reaches Maximum Capacity	Overflow Discharge	The screw conveyor on the #3 grit basin required repairs. A limited number of basins were available due to grit pump replacements. To repair #3, flows to the others had to be throttled resulting in overflows on the 2nd and 13th. The flows were throttled for a total of 8 and 6 hours on the 2nd and 13th respectively. Rain events influenced the flow to the plant on both days.

TABLE 4.1-3 (Continued)

Date	Discharge Parameter	Permit Level	Exceedance Value	Corrective Actions/Comments
6/14-15/90	Combined Sewer Overflow	No Discharge until Plant reaches Maximum Capacity	Overflow Discharge	During this period only two grit basins were in service. A contractor had removed a grit pump from one basin and plugged the line. The plug leaked and flooded the chamber containing two sets of pumps. A rain event influenced the plant flow during this period. The duration of the overflow was 14 hours.
6/15-19/90	Combined Sewer Overflow	No Discharge until Plant reaches Maximum Capacity	Overflow Discharge	The screw conveyor in one grit basin required maintenance. Flow had to be throttled to prevent water entry into the grit chamber. A rain event influenced the plant flow during this period. The duration of the overflow included a total of 8 hours.
6/21/90	Combined Sewer Overflow	No Discharge until Plant reaches Maximum Capacity	Overflow Discharge	A combined sewer overflow occurred when maintenance operations were required on one grit chamber leaving only two in operation. Plant flows had to be throttled to prevent flows into the third chamber. After repairs were completed the basin was put back into service. The duration of the overflow was 3 hours.
6/22-23/90	Combined Sewer Overflow	No Discharge until Plant reaches Maximum Capacity	Overflow Discharge	The influent flow to the plant was throttled causing a combined sewer overflow. The duration of the overflow was 5 hours.

Southeast Water Pollution Control Plant Exceedances

SEWPCP NPDES PERMIT EXCEEDANCES

Date	Discharge Parameter	Permit Limit	Exceedance Value	Corrective Actions/Comments
February/91	Monthly Average Suspended Solids Percent Removed	85%	83%	Very low influent suspended solids resulted in an extremely low effluent suspended solids requirement which was not achieved. Monthly average suspended solids in the effluent was 17 mg/l.
12/02/91 12/29/91	Instantaneous Maximum Suspended Solids	60 mg/l	73 mg/l 80 mg/l	The average daily flows on these days were high due to rain events. Above normal sludge blanket levels resulted in a washout of solids on these dates.
December/91	Monthly Average Suspended Solids Percent Removal	85%	82%	High sludge blankets contributed to higher effluent solids loading.
11/11/91 11/22/91	Instantaneous Maximum Suspended Solids	60 mg/l	70 mg/l 130 mg/l	The average daily flows were high on these dates due to rain events. High flows in conjunction with high sludge blanket levels caused these exceedances.
October/91	Fecal Coliform	No more than 1000/100 ml in 10% of samples (3)	More than limit in 7 samples.	Residual chlorine levels were in a range which normally provides sufficient disinfection. Sampling procedures are suspected as the cause.
8/09/91	Instantaneous Maximum Suspended Solids	60 mg/l	180 mg/l	Heavy rains and high sludge blankets resulted in a high suspended solids discharge.
7/24/91	Instantaneous Maximum Suspended Solids	60 mg/l	62 mg/l	High sludge blanket levels resulted in an elevated suspended solids. The sludge levels were elevated due to restricted waste activated sludge pumping time to the SW plant.

TABLE 4.2-3 (Continued)

Date	Discharge Parameter	Permit Limit	Exceedance Value	Corrective Actions/Comments
April/91 March/91	Combined Sewer Overflow	No discharge until plant reaches maximum capacity	Overflow Discharge	Influent throttling may have occurred during March and April 1991. A review of operating procedures was conducted to determine the reason and duration of influent throttling.
July/1990	Fecal Coliform	No more than 1000/100 ml in 10% of samples (3)	More than limit in 5 samples	Fecal coliform exceedances were measured on five days. A hydraulic flushing of the effluent conduits and increasing the chlorine dosage has apparently solved the problem.

March of the 1992 fiscal year are presented in Table 4.2-4. The flows presented were consistently below the plant design value except for August of 1991. The flows in July, August and September 1991 exceeded the permitted average monthly flow, but did not approach the maximum daily average of 168 MGD.

Southwest Water Pollution Control Plant Exceedances

SWWCP NPDES PERMIT EXCEEDANCES

Date	Discharge Parameter	Permit Limit	Exceedance Value	Corrective Action/Comments
3/19/92	Suspended Solids Daily Maximum	60 mg/l	79 mg/l	Due to rain events, a flow of 286.1 MGD was being treated by the plant. Three out of eight DAFs were out of service due to instrumentational problems and sludge could not be pumped to the SPDC for disposal.
December 1991 12/20/91 12/28/91	FSOD Loading Suspended Solids Loading Suspended Solids Daily Maximum	37,020 lbs/day 50,040 lbs/day 60 mg/l 60 mg/l	37,617 lbs/day 53,673 lbs/day 68 mg/l 82 mg/l	An unusually high average monthly flow of 208.5 MGD (Design 210 MGD) combined with cryogenic oxygen plant problems and sludge processing problems caused the elevated discharge parameters.
7/13/91	Maximum Daily Average Flow	300 MGD	331.3 MGD	The elevated flow was caused by a rain event. All discharge parameters were met and no plant damage occurred as a result of the high flow.
6/28/91 6/29/91 6/30/91	Suspended Solids Daily Maximum	60 mg/l	88 mg/l 157 mg/l 66 mg/l	During this period, the cryogenic oxygen plant was shut down. No oxygen was fed to the aeration tanks.
1/12/91	Suspended Soilds Daily Maximum	60 mg/l	80 mg/l	High influent flows resulted in a washout of sludge from the final sedimentation tanks.
January 1991	Suspended Solids Percent Removal	85%	82%	High flows and solids washout of sludge from the final sedimentation system resulted in a decreased suspended solids percent removal.
December 1990	Suspended Solids Percent Removal	85%	84%	A cryogenic oxygen plant outage resulted in operating the aeration tanks without oxygen for several days, resulting in an elevated suspended solids discharge.
September 1990	BOD_5 Percent Removal	89.25%	70%	BOD_5 levels as compared to nitrogen inhibited samples were significantly elevated. The difference may have been due to the growth of nitrifying bacteria in portions of the automatic sampler.
August 1990	BOD_5 Percent Removal	89.25%	73%	A weak BOD_5 influent level and the effects of nitrification have resulted in a decreased BOD_5 percent removal.
July 1990	BOD_5 Percent Removal	89.25%	73%	A weak BOD_5 influent level and the effects of nitrification have resulted in a decreased BOD_5 percent removal.
June 1990	BOD_5 Percent Removal Suspended Solids Percent Removal	89.25% 85%	75% 84%	A weak BOD_5 influent (79 mg/l) and electrical problems with the cryogenic oxygen plant resulted in poor BOD_5 and suspended solids removals.

APPENIX J

Basis Of Design For Water Pollution Control Plants

Bases of Design, Northeast WPCP

TABLE 2-1-1 (Continued)

BASES OF DESIGN

SECONDARY TREATMENT (Continued)

Process Air Requirements (Continued)

Total, ppd		238,000
mg/l		136
Process Air Requirements, scfm		
Activated sludge		61,000
Channel aeration		16,000
Total requirements		77,000
Process Air Blowers, Blowers 1 through 4		
Capacity of each, actual cfm (acfm), [scfm]	35,000	[51,000]
Installed capacity, acfm [scfm]	140,000	[204,000]
Blowers 5 and 6		
Capacity of each, acfm [scfm]	27,000	[39,300]
Installed capacity, acfm [scfm]	54,000	[78,600]
Blowers 1 through 6		
Total installed capacity, acfm [scfm]	194,000	[282,600]
Total firm capacity, acfm [scfm]	159,000	[231,600]

Final Sedimentation Tanks	Tank Set 1	Tank Set 2
Wastewater Flow, mgd	105	105
Number of Tanks	8	8
Size, Each Tank L x W, ft	214 x 75	231 x 70
Average Liquid Depth, ft	11	13
Area Each Tank, sf	16,100	16,200
Area Each Set, sf	128,800	129,600
Surface Loading, gpd/sf	815	810
Total Area, sf	258,400	
Volume Each Tank, cf	177,000	211,000
Volume Each Set, cf	1,416,000	1,688,000
Total Volume, cf	3,104,000	
million gallons	23.2	
Weir Length, ft	6,900	6,900
Weir Loading, gpd/linear foot (lf)	15,200	
* Displacement Time, hrs	2.5	3.0
Final Sedimentation Tank Effluent		
S.S., ppd	52,500	
mg/l	30	
BOD_5, ppd	33,300	
mg/l	19	

BASES OF DESIGN

DISINFECTION

Chlorine Contact Tank

Wastewater Flow, mgd	210
Contact Tanks	
Number of channels	6
Size each channel, L x W, ft	300 x 28
Average water depth, ft	11
Volume, cf	549,800
million gallons	4.11
Displacement Time, minutes*	35
Chlorine Dosage, mg/l	8.0
ppd	14,000
Chlorine Storage, days	7.9
Tank Car Capacity, tons	55
Chlorinators	
Type	Solution Feed
Number	4
Capacity of ~~each~~, ppd (3 plant H_2O (1	8,000

SLUDGE AND SCUM TREATMENT

Scum Removal

Scum Quantities	
Primary Sedimentation Tanks	
Wastewater flow, mgd	210
Dry pounds/mg	75
Dry ppd	15,750
Final Sedimentation Tanks**	
Wastewater flow, mgd	210
Dry pounds/mg	168**
Dry ppd	17,640
Total	
Dry ppd	33,390
Dry pounds/hr	1,410
Firm Pumping Capacity, gpm	
Primary Sedimentation Tank Set 1	350
Primary Sedimentation Tank Set 2	150
Final Sedimentation Tank Sets 1 and 2	460
Total capacity	960
Scum Concentration Tanks	
Number	2
Size, L x W, ft	30 x 10
Average depth, ft	9.5
Total volume, cf	5,700
Maximum surface loading rate, gpd/sf	2,320
Minimum displacement time, minutes	44

* Includes the minimum volume in the outfall conduits

** Scum removal dry pounds/mg figure based on scum being generated in Final Sedimentation Tank Set 1 only. Tank Set 2 is designed to remove scum if Primary Sedimentation Tanks are out of service.

TABLE 2-1-1 (Continued)

BASES OF DESIGN

SLUDGE AND SCUM TREATMENT (Continued)

Scum Removal (Continued)

Scum Incinerators	
Number	2
Capacity, dry ppd	
Installed	76,800
Firm	38,400

Sludge Thickener Building

Excess Secondary Sludge for Disposal	
ppd	217,000*
percent solids	1.2
mgd	2.17
gpm	1,510
Excess Secondary Sludge to Thickeners (ESS for Disposal/0.85)	
ppd	255,000
percent solids	1.2
mgd	2.55
gpm	1,780
Dilution Water Requirements	
percent of ESS flow	225
flow, gpm	4,000
Thickener Tanks	
Number	12
Active (one tank out of service)	11
Tank Dimensions	
L x W, ft	90 x 20
Surface area per tank, sf	1,800
Thickener Tanks (one tank out of service)	
Total surface area, sf	19,800
Liquid depth, ft	12
Total volume, cf	237,600
Hydraulic detention time, minutes	310
Overflow rate, gal/day/sf	420
Thickener Performance (one tank out of service)	
Gross loading, pounds/sf/day	12.9
Net loading, pounds/sf/day	11.0
Thickener efficiency, percent	85
Thickened Excess Secondary Sludge**	
ppd	217,000
percent solids	4
mgd	0.65
gpm	450
Thickener Underflow	
ppd	38,000
percent solids	0.060
mgd	7.68
gpm	5,330

---

* Based on 0.8 pounds of excess secondary sludge produced per pound of BOD_5 applied to Aeration Tanks

** Based on 85% recovery in thickener tanks

TABLE 2-1-1 (Continued)

BASES OF DESIGN

SLUDGE AND SCUM TREATMENT (Continued)

Sludge Thickener Building (Continued)

Thickener Process Air Requirements*	
Air-to-solids ratio	0.015
Air flow rate, scfm	50.1
Pressurization tank pressure, psig	60

Sludge Digestion Tanks	Tank Set 1	Tank Set 2
Primary Sludge		
Flow, gpm	330	
Percent solids	6	
Percent volatile	65	
Volatile solids, ppd	153,700	
Inert solids, ppd	82,800	
Total solids, ppd	236,500	
Thickened Excess Secondary Solids		
Flow, gpm	450	
Percent solids	4	
Percent volatile	75	
Volatile solids, ppd	162,700	
Inert solids, ppd	54,300	
Total solids, ppd	217,000	
Total Sludge to Digestion Tanks		
Flow, gpm	780	
Percent solids	4.8	
Percent volatile	69.8	
Volatile solids, ppd	316,400	
Inert solids, ppd	137,100	
Total solids, ppd	453,500	
Digestion Tanks		
Total number of tanks**	8	4
Tank dimensions		
Diameter, ft	110	105
Depth at side wall, ft	30	28.5
Volume per tank, cf	300,000	260,000
Total volume		
All tanks active, cf***	3,180,000	
One tank out of service, cf	2,920,000	
Displacement Time		
All tanks active, days	21.2	
One tank out of service, days	19.4	
Volatile Solids Loading		
All tanks active, lbs VSS/cf/day	0.099	
One tank out of service, lbs VSS/cf/day	0.108	
Volatile Solids Reduction, percent	50	
Volatile Solids Destroyed, ppd	158,200	

---

* Includes the thickener process air demand only. Does not represent the quantity necessary for air compressor sizing

** One tank from Tank Set 2 normally used as Sludge Storage Tank

*** Based on 11 tanks available for digestion

TABLE 2-1-1 (Continued)

BASES OF DESIGN

SLUDGE AND SCUM TREATMENT (Continued)

Sludge Digestion Tanks (Continued)	Tank Set 1	Tank Set 2
Digested Sludge from Digestion Tanks		
Flow, gpm	780	
Percent solids	3.2	
Percent volatiles	53.6	
Volatile solids, ppd	158,200	
Inert solids, ppd	137,100	
Total solids, ppd	295,300	
Sludge Gas Facilities		
Volatile Solids Destroyed, ppd		158,200
Gas Production, scf/lb VSS destroyed		13
Sludge Gas, 1,000 scf/day		2,060
Heat Value, million Btu/day*		1,240
million Btu/hr		52
Gas Compressors		
Type		Rotary lobe positive displacement
Number		2
Capacity of each, scfm		2,250
Operating pressure, psig		6 to 7
Waste Gas Burners		
Type		Ring type pilot
Number		10
Capacity of each, scfh		30,000
Total capacity, scfh		300,000
Gas Storage Tank		
Type		Floating Cover
Number		1
Capacity, cf		50,000
Operating pressure, inches W.C.		6
Sludge Dewatering Facility		
Digested Sludge to Sludge Dewatering Facility		
Total solids, ppd**		413,400
Percent solids		3.2
Flow, gpm**		1,750

---

* Based on 600 Btu/cf

** Values adjusted to reflect 5 day per week and 2 shift per day operation of Sludge Dewatering Facility

TABLE 2-3-1 (Continued)

BASES OF DESIGN
SLUDGE HANDLING

Waste Activated Sludge Transfer Pumps

Number of Pumps	2
Capacity	
Each Pump - GPM	500
Head - Ft	200

TABLE 2-3-2

SOUTHEAST WPCP
OPERATION AND MAINTENANCE MANUAL

BASES OF DESIGN
SCUM REMOVAL

Scum Quantities	
Wastewater Flow - MGD	120
Dry Pounds/Million Gallons	50-100
Dry Pounds/Day	6,000-12,000
Dry Pounds/Hour	250-500
Primary Scum Ejectors	
Number	2
Capacity each, GPM	300
Final Scum Pumps	
Number	8
Capacity each, GPM	400
Scum Concentration Tanks	
Number	2
Size - L x W - Ft	30 x 7.5
Side Water Depth - Ft	9.67
Total Volume - Cu Ft	4350
Surface Loading Rate - GPD/Sq Ft (@ 400 GPM)	1440
Detention Time - Minutes (@ 400 GPM)	72
Grease Burners	
Number	2
Maximum Feed Rate/Burner - Dry Lbs/Day - Dry Lbs/Hr	21,600 900

Bases of Design, Southeast WPCP

TABLE 2-2-1

SOUTHEAST WPCP
OPERATION AND MAINTENANCE MANUAL

BASES OF DESIGN
PRELIMINARY TREATMENT

Influent Pumping	
Number of Pumps	
Variable Speed Pumps	3
Constant Speed Pumps	3
Capacity - each pump - MGD	70
Head - Ft	45
Screenings Removal	
Screenings Removed - Cu Ft/Million Gallons	0.85
- Cu Ft/Day (Annual Average)	102
Density - Lbs/Cu Ft (Wet)	55
Screenings Removed - Lbs/Day (Annual Average)	5,600
- Lbs/Hr (Maximum Rate)	470
Percent Moisture	75
Percent Volatiles	75
Bar Screens	
Number of Screens	6
Clear Bar Spacing - Inches	1
Type	Catenary
Angle of Inclination - Degrees	75
Width of Screen Channels - Ft	6.5
Maximum Velocity through the Screens - Ft/Sec	2.3

TABLE 2-2-1 (Continued)

BASES OF DESIGN
PRELIMINARY TREATMENT

Grit Removal

Grit Removed - Cu Ft/Million Gallons	3.7
- Cu Ft/Day (Annual Average)	440
- Cu Ft/Day (Maximum Rate)	890
Density - Lbs/Cu Ft (Wet)	100
Grit Removed - Lbs/Day (Annual Average)	44,000
- Lbs/Hr (Maximum Rate)	3,700
Percent Moisture	30
Percent Volatiles	15
Grit Removal Facilities	
Number of Channels	6
Channel Width - Ft	10
Channel Length - Ft	140
Particle Size Removed:	
Mesh	65
Percent Removal	95
Chain Flight Collectors	
Number of Units	6
Length - Ft	140
Width - Ft	9
Screw Conveyors	
Number of Units	6
Conveyor Capacity - Lbs/Hr	2,000

TABLE 2-2-1 (Continued)

BASES OF DESIGN
PRELIMINARY TREATMENT

Grit Removal (Continued)

Pneumatic Transporters	
Number of Units	2
Transporter Capacity - Cu Ft/Hr	120

TABLE 2-[illegible]-2

SOUTHEAST WPCP
OPERATION AND MAINTENANCE MANUAL

BASES OF DESIGN
PRIMARY TREATMENT

Primary Sedimentation Tanks

Number of Tanks	4
Length - Ft	250
Width - Ft	125
Number of Channels	7
Average Water Depth - Ft	12
Total Surface Area - Sq Ft	125,000
Total Volume - Cu Ft	1,500,000
- Million Gallons	11.2
Weirs	
Length - Ft	2,540
Overflow Rate - Gal/Ft/Day	47,000
Surface Loading - Gal/Sq Ft/Day	960
Displacement - Hours	2.2
Suspended Solids Loading (Annual Average)	
Lbs/Day	208,000
Percent Removed	55
Lbs/Day Removed	114,000
BOD Loading (Annual Average)	
Lbs/Day	196,000
Percent Removed	40
Lbs/Day Removed	78,000

TABLE 2-2-3

SOUTHEAST WPCP
OPERATION AND MAINTENANCE MANUAL

BASES OF DESIGN
SECONDARY TREATMENT

Aeration Tanks

Mixed Liquor Flow - MGD	
25% Return Sludge	150
50% Return Sludge	180
Suspended Solids Applied to the Aerator (Annual Average)	
Settled Sewage - Lbs/Day	94,000
Total Loading - Lbs/Day	94,000
- Mg/L	94
BOD Applied to the Aerator (Annual Average)	
Settled Sewage - Lbs/Day	118,000
Total Loading - Lbs/Day	118,000
- Mg/L	118
Number of Tanks	8
Number of Stages per Tank	4
Average Water Depth - Ft	14.3
Size of Stage - Ft	52.5 x 52.5
Total Volume of Aerator - Cu Ft	1,261,000
- Million Gallons	9.4
Aerator Average MLSS - Mg/L	4,000
Mixed Liquor Volatile Solids - Percent	75
Displacement - Hrs	
Wastewater Flow	1.9

TABLE 2-2-3 (Continued)

BASES OF DESIGN
SECONDARY TREATMENT

Final Sedimentation Tanks

Number of Tanks	12
Size of Each Tank	
Length - Ft	214
Width - Ft	68
Average Water Depth - Ft	11
Total Surface Area of Tanks - Sq Ft	175,000
Total Volume of Tanks - Cu Ft	1,925,000
- Million Gallons	14.4
Weirs	
Length - Ft	9,408
Overflow Rate - Gal/Ft/Day	12,700
Surface Loading - Gal/Sq Ft/Day	
Wastewater Flow	685
Mixed Liquor Flow	
25% Return Sludge	860
50% Return Sludge	1,030
Displacement - Hrs	
Wastewater Flow	2.9
Mixed Liquor	
25% Return Sludge	2.3
50% Return Sludge	1.9

TABLE 2-2-4

SOUTHEAST WPCP
OPERATION AND MAINTENANCE MANUAL

BASES OF DESIGN
OXYGEN GENERATING PLANT

Type of Facility	Cryogenic
Number of Units	2
Size of Units - Tons/Day	50
Maximum Oxygen Production - Tons/Day	100
Liquid Storage - Gal.	25,000

TABLE 2-2-5

SOUTHEAST WPCP
OPERATION AND MAINTENANCE MANUAL

BASES OF DESIGN
EFFLUENT PUMPING

Number of Effluent Pumps	
Variable Speed Pumps	3
Constant Speed Pumps	2
Capacity	
Each Pump - MGD	70
Total - MGD	280
Head - Ft	11

TABLE 2-2-6

SOUTHEAST WPCP
OPERATION AND MAINTENANCE MANUAL

BASES OF DESIGN
CHLORINATION

Wastewater Flow - MGD	
Annual Average	120
Maximum Rate	240
Chlorine Dosage - Mg/L	8
- Lbs/Day (Annual Average)	8,000
Chlorinators	
Type	Solution Feed
Number	3
Capacity (each) - Lbs/Day	8,000
Chlorine Storage	
Type	Tank Car
Capacity - Tons	~~55~~ 90
- Days	13
Outfall Conduit Retention Time (Mean High Tide Elevation 97.75)	
At Annual Average Flow - Minutes	37.2
At Maximum Rate of Flow - Minutes	18.9

TABLE 2-3-1

SOUTHEAST WPCP
OPERATION AND MAINTENANCE MANUAL

BASES OF DESIGN
SLUDGE HANDLING

Sludge Production

Primary Sludge	
- Lbs/Day (dry basis)	131,000
- Percent Solids	5
- GPM	220
Waste Activated Sludge	
- Lbs/Day (dry basis)	77,800
- Percent Solids	1.5
- GPM	432

Storage Tanks

Number of Tanks	2
Tank Dimensions	
Diameter - Ft	68
Sidewater Depth - Ft	30
Volume Per Tank - Cu Ft	112,000
- Gallons	840,000
Storage Time - Days	
Primary Sludge	2.65
Waste Activated Sludge	1.35

Primary Sludge Transfer Pumps

Number of Pumps	2
Capacity	
Each Pump - GPM	540
Head - Ft	350

Bases of Design, Southwest WPCP

PHILADELPHIA WATER DEPARTMENT

SOUTHWEST WPC PLANT

BASIS OF DESIGN

TABLE 6

THE CITY OF PHILADELPHIA

SOUTHWEST PLANT

Bases of Design (1990)

October 1972

	Design
1. Basic Data	
Tributary Area - Acres	
Philadelphia	27,200
Suburban Areas	88,500
Total	115,700
Population	
Philadelphia	655,000
Suburban Areas	700,000
Total	1,355,000
Population Density - Persons/Acre	
Philadelphia	24.1
Suburban Areas	7.9
Total	11.7
2. Wastewater Quantities	
Annual Average - MGD	
Philadelphia	118
Suburban Areas	92
Total	210

	Design
2. Wastewater Quantities (Continued)	
Maximum Month DWF (An. Avg. x 1.2) - MGD	252
Maximum Day DWF (An. Avg. x 1.5) - MGD	315
Maximum Rate (An. Avg. x 2.0) - MGD	420
3. Wastewater Characteristics	
Annual Average SS - mg/l	279
- Lbs/Day (Dry Basis)	488,000
- Lbs/Cap/Day	0.36
Annual Average BOD - mg/l	193
- Lbs/Day	339,000
- Lbs/Cap/Day	0.25
Screenings - Cu.Ft./Mil.Gal.	0.85
- Cu.Ft./Day	178 ←
Grit - Cu.Ft./Mil.Gal.	5.20
- Cu.Ft./Day	1,090 ←
Scum - Dry Lbs/Mil.Gal.	50-100
- Lbs/Day	10,500-21,000
4. Wastewater Pumping (Low Level System)	1050 178 1260
Raw Sewage Pumps	
Existing	2
New	2
Total	4

	Design
4. Wastewater Pumping (Low Level System) (Continued)	
Capacity - MGD	
Existing - 1 @ 10 MGD, 1 @ 20 MGD	30
New - 2 @ 20 MGD	40
Total (installed)	70
Total (firm)	50
Head - Ft.	48
Screens	
Type	Trash Rack
Number	2
Clear Bar Spacing - Inches	4
5. Grit Removal	
Grit Removal - Cu.Ft./Mil.Gal.	5.20
- Cu.Ft./Day (An. Avg.)	1,090
- Cu.Ft./Day (Max. Rate)	2,180
Density - Lbs/Cu.Ft. (Wet)	120
Grit Removed - Lbs/Day (An. Avg. Wet)	131,000
- Lbs/Hr. (An. Avg. Wet)	5,460
- Lbs/Hr. (Max. Rate Wet)	10,920
Percent Moisture	50
Percent Volatiles	25
Type of Facility	Detritor Basin
Number of Units	4

Ash quantity 12.5 t... grit x 0.75 dry x 0.25 vol...

	Design
5. Grit Removal (Continued)	
Dimensions - Ft.	60 x 60
Maximum Flow - MGD (Year 2020)	570
Particle Size Removed - Mesh	65
Grit Removal Equipment	
Number of Inclined Flight Collectors	4
Flight Collector Capacity - Tons/Hr.	3
Number of Tube Conveyors	4
Tube Conveyor Capacity - Tons/Hr.	3
6. Screenings Removal	
Screenings Removal - Cu.Ft./Mil.Gal.	0.85
- Cu.Ft./Day (An. Avg.)	178
- Cu.Ft./Day (Max. Rate)	356
Density - Lbs/Cu.Ft. (Wet)	55
Screenings Removed - Lbs/Day (An. Avg. Wet)	9,600
- Lbs/Hr. (An. Avg. Wet)	400
- Lbs/Hr. (Max. Rate Wet)	800
Percent Moisture	85
Percent Volatiles	75
Mechanical Sewage Screens	
Flow - MGD (Max. Rate Year 2020)	570
Number of Screens	8
Width of Channel - Ft.	6

July Aug 72 = 88%

	Design
6. Screenings Removal (Continued)	
Maximum Velocity - Fps (570 MGD-Year 2020)	3.2
Clear Bar Spacing - Inches	1
Type	84-degree, inclined front cleaned
Screenings Removal Equipment	
Screen Belt Conveyors	2
Belt Conveyor Capacity - Cu.Ft./Day (Max. Rate)	180
- Lbs/Hr. (Max. Rate)	400
Combined, Inclined Screen Belt Conveyor	1
Belt Conveyor Capacity - Cu.Ft./Day (Max. Rate)	360
- Lbs/Hr. (Max. Rate)	800
Shredder Feed Belt Conveyor	
Belt Conveyor Capacity - Cu.Ft./Day (Max. Rate)	360
- Lbs/Hr. (Max. Rate)	800
Screening Shredder	
Number of Units	2
Shredder Capacity - Cu.Ft./Day (Max. Rate)	360

	Design
7. Grit and Screenings Incineration	
Combined Grit and Screenings Belt Conveyor	
Belt Conveyor Capacity - Cu.Ft./Day (Max. Rate)	2,600
- Lbs/Hr. (Max. Rate)	12,000
Grit and Screenings Storage Hoppers	
Number of Units	4
Hopper Capacity - Cu.Ft. (Each)	600
Hopper Discharge Belt Conveyor	
Number of Units	2
Belt Conveyor Capacity - Cu.Ft./Day (An. Avg.)	1,300
- Lbs/Hr. (An. Avg.)	6,000
Bucket Elevator	
Number of Units	2
Bucket Elevator Capacity - Tons/Hr.	3
Multiple Hearth Incinerator	
Number of Units	2
Operating Time - Hr./Week 7x24=168	168
Cake Feed - Lbs/Hr. (Year 1990)	6,000
Moisture @ 60% of Cake Feed - Lbs/Hr.	3,600
Solids @ 40% of Cake Feed - Lbs/Hr.	2,400
Volatile @ 30% of Cake Feed - Lbs/Hr.	720

	Design
7. Grit and Screenings Incineration (Continued)	
Outside Diameter - Ft.	16'-9"
Number of Hearths (Including Afterburner)	7
Feed Screw Conveyors	
Number of Units	2
Screw Conveyor Capacity - Lbs/Hr.	6,000
Feed Hoppers	
Number of Units	2
Hopper Capacity - Cu.Ft.	50
Discharge Ash Hopper	
Number of Units	2
Hopper Capacity - Cu.Ft.	80
Ash Storage Hopper	
Number of Units	1
Hopper Capacity - Cu.Ft.	2,800
Ash Unloader Capacity - Tons/Hr.	50

8. Primary Sedimentation Tanks

	Existing	New and Existing
Wastewater Flow - MGD (An. Avg.)	136	210
Number of Tanks	4	5
Size Each Tank - Ft.	250'Lx125'W	250'Lx125'W
Average Water Depth - Ft.	12	12

		Design
8. Primary Sedimentation Tanks (Continued)	Existing	New and Existing
Total Surface Area - Sq. Ft.	124,800	156,000
Total Volume - Cu. Ft.	1,500,000	1,815,000
- MG	11.24	14.05
Surface Loading - Gal/Sq.Ft./Day	1,090	1,350
Displacement Time - Hrs.	2.0	1.6
Weir Length - Ft.	1,064	4,600
Weir Overflow - Gal/Ft/Day	128,000	45,700
SS Loading - Lbs/Day (An. Avg.)	-	488,000
Percent Removed	-	45
Lbs/Day Removed	-	220,000
BOD Loading - Lbs/Day (An. Avg.)	-	339,000
Percent Removed	-	25
Lbs/Day Removed	-	85,000
9. Aeration Tanks (Oxygen)		
Wastewater Flow - MGD		210
Mixed Liquor Flow - MGD		
30% Return Sludge		273
50% Return Sludge		315
SS Applied to Aerator - Lbs/Day		268,000
- mg/l		153

	Design
9. Aeration Tanks (Oxygen) (Continued)	
BOD Applied to Aerator - Lbs/Day	254,000
- mg/l	145
Number of Tanks	10
Number of Stages per Tank	4
Average Water Depth - Ft.	16
Total Volume of Aerator - Cu.Ft.	2,320,000
- Gal	17,300,000
Aerator Average MLSS - mg/l	5,900
Mixed Liquor Volatile Solids - percent	66
BOD Loading	
Lbs. BOD Applied per 1,000 Ft.^{3} per Day	108
Lbs. BOD Applied per 100 Lbs. MLSS per Day	30
Lbs. BOD Applied per Lb. MLVSS per Day (F/M)	0.45
BOD Sludge Age - Days	3.3
Solids Retention Time - Days	2.1
Displacement Time - Hrs. (An. Avg.)	
Wastewater Flow	1.98
30% Return Sludge	1.52
50% Return Sludge	1.32
Oxygen Required - Tons/Day (An. Avg.)	170
- Tons/Day (Max. Day)	195

	Design
10. Oxygen Generation	
Type of Facility	Cryogenic
Number of Units	2
Size - Tons/Day	90
Total Oxygen Production - Tons/Day	180
Liquid Oxygen Storage - Gallons	50,000
11. Final Sedimentation Tanks	
Number of Tanks	20
Size of Each Tank - Ft.	76'Wx260'L
Average Water Depth - Ft.	11
Total Surface Area - Sq.Ft.	395,000
Total Volume - Cu.Ft.	4,345,000
- MG	32.35 32.5
Surface Loading - Gal/Sq.Ft./Day	
Wastewater Flow	530
30% Return Sludge	~~635~~ 634
50% Return Sludge	795
Displacement Time - Hrs.	
Wastewater Flow	3.70
30% Return Sludge	2.85
50% Return Sludge	2.46
Weir Length - Ft.	16,320
Weir Overflow - Gal/Ft./Day	12,800

	Design
11. Final Sedimentation Tanks (Continued)	
SS Removal - Lbs/Day	153,000
BOD Removal - Lbs/Day	232,000
Effluent Characteristics (An. Avg.)	
Flow	210
Suspended Solids - Lbs/Day	49,000
- mg/l	28
BOD - Lbs/Day	21,830
- mg/l	13
12. Scum Removal	
Annual Average Quantity - Lbs/MG	50-100
- Lbs/Day	10,500-21,000
Scum Flow Rate - MGD	1.50
Scum Incinerators (Under Construction)	
Type	Water Grate
Number	2
Capacity (Each) - Lbs/Hr.	1,500
Scum Concentration Tanks	
Number	2
Size (Each) - Ft.	8'-6"Wx34'-0"L
Total Volume - Cu.Ft.	4,600
Detention Time - Min.	30

	Design
13. Chlorination	
Chlorine Dosage - Lbs/Day	14,000
- mg/l	8.0
Chlorinators	
Type	Solution Feed
Number of Units	4
Capacity (Each) - Lbs/Day	8,000
Chlorine Storage	
Type	Tank Car
Capacity - Tons	55
- Days	8
Outfall Residence Time, Min., at Mean High Tide Elevation 97.75	
At Annual Average Flow	32.8
At Maximum Rate Flow	24.5
14. Sludge Thickening Tanks	
Solids to Thickeners - Waste Activated Sludge	
Lbs/Day (Dry Basis)	153,000
Percent Solids	2.2
MGD	0.83
GPM	578
Thickening Tanks (Air Flotation)	
Number (Active)	7

	Design
14. Sludge Thickening Tanks (Continued)	
Number (Total)	8
Size - Ft.	18x70
Depth - Ft.	8
Area per Tank - Sq.Ft.	1,260
Total Area - Sq.Ft.	9,820
Total Volume - Cu.Ft.	~~78,560~~ 80,640
Thickener Loading - Lbs/Sq.Ft./Day	17
Dilution Water Ratio - Percent	450
Overflow Rate - Gal/Sq.Ft./Day	525
Detention Time - Min.	180
Thickened Sludge	
Lbs/Day	153,000
Percent Solids	4.0
MGD	0.46
GPM	318
15. Sludge Digestion Tanks	
Solids to Digesters	
Primary Sludge - Existing Tanks	
Lbs/Day	220,000
Percent Solids	5.0
GPM	367

	Design
15. Sludge Digestion Tanks	
Waste Activated Sludge	
Lbs/Day	153,000
Percent Solids	4.0
GPM	318
Combined Sludge	
Lbs/Day	373,000
Percent Solids	4.5
GPM	685
Digesters (New)	
Number	8
Size - Ft.	110 Diam., 30 SWD
Total Volume - Cu.Ft.	2,800,000
Average Displacement Time - Days	21.2
Percent Volatile Solids in Sludge	66
Volatile Solids Loading - Lbs/Day/Cu.Ft.	0.088
One Digester Out of Service	
Displacement Time - Days	18.6
Volatile Solids Loading - Lbs/Cu.Ft./Day	0.100
Digested Sludge	
Destruction of Volatile Solids - Percent	50

	Design
15. Sludge Digestion Tanks (Continued)	
Volatile Solids Destroyed - Lbs/Day	123,000
Sludge from Digesters	
Lbs/Day	250,000
MGD	0.88
GPM	690
Percent Solids	3.0
Wet Sludge - Lbs/Day	8,280,000
Sludge Storage Tank	
Size - Ft.	110 Diam., 30 SWD
Total Volume - Cu.Ft.	133,000

Volume of New Digesters (Each) 331,000 ft³
Volume of Modified Digesters (Each) 277,500 ft³
Dia. of Modified Digesters 104 ft

TABLE 2-2

CITY OF PHILADELPHIA
WATER DEPARTMENT

SOUTHWEST WATER POLLUTION CONTROL PLANT
SLUDGE DEWATERING FACILITY

Bases of Design

Greeley and Hansen
March 1984

	Design Condition	
	Annual Avg.	Max. Monthly
1. Wastewater Flow		
Southwest WPCP, mgd	117	140
Southwest WPCP, mgd	200	240
2. Raw Sludge Production		
SE-WPCP and SW-WPCP Combined		
Total Solids, lbs/day	474,000	570,000
, tons/day	237	285
Volatile Solids, lbs/day	315,000	381,000
Inert Solids, lbs/day	159,000	189,000
Percent Solids	4.5	4.5
Flow, gpm	875	1,060
3. Digested Sludge to Sludge Storage Tanks		
Volatile Solids Reduction by Digestion, %	50	50
Volatile Solids Remaining, lbs/day	157,500	190,500
Inert Solids, lbs/day	159,000	189,000
Total Solids, lbs/day	316,500	379,500
, tons/day	158	190
Percent Solids	3	3
Flow, gpm	875	1,060
4. Sludge Storage Tanks		
Number of Tanks	2	2
Tank Inside Dimensions, ft.	96 x 96	96 x 96
Side-wall Water Depth, ft.	27	27
Volume per Tank, cu.ft.	250,000	250,000
Total Volume, cu.ft.	500,000	500,000
Hydraulic Detention Time, days	3	2.5

APPENDIX K

Consent Order

TO : Distribution

DATE 4/27/90

FROM : Abby L. Pozefsky, Divisional Deputy City Solicitor

SUBJECT: CONSENT DECREE IN US V. CITY OF PHILADELPHIA, CIVIL ACTION #88-6791, UNITED STATES DISTRICT COURT, EASTERN DISTRICT PENNSYLVANIA

Attached please find a copy of the Partial Consent Decree governing the Southwest Plant as agreed to by the City, the Pennsylvania Department of Environmental Resources, U.S. Environmental Protection Agency and the U.S. Department of Justice. It is a Partial Consent Decree in that the City continues to negotiate with DER a companion decree dealing with solid waste management issues at the Southwest Plant and the Sludge Processing and Distribution Center; I anticipate that the second decree will be filed with the Court within the next month.

The salient features of the Partial Consent Decree are as follows:

1. The City must complete five identified rehabilitation projects at the Southwest plant by certain milestone dates, and must maintain the equipment strictly for six months thereafter.
   Paragraphs 8 - 12

2. The City must comply with interim and final effluent limitations.
   Paragraphs 15 - 18.

3. The City must issue pretreatment permits containing effluent limits and monitoring and reporting requirements for the City's Belmont and Queen Lane Water Treatment Plants. The plants must maintain strict compliance with the terms for between 12 and 18 months.
   Paragraphs 20-24.

4. The City must institute biomonitoring.
   Paragraphs 25-26; Attachment A.

5. The City must retain an independent consultant to evaluate remedial action, staffing and maintenance requirements for the Southwest Plant. The City is required to fully implement the plan.
   Paragraphs 27-40.

6. The City undertakes substantial reporting requirements in connection with the Decree.
   Paragraphs 43 and 44.

7. The City shall pay stipulated penalties for any violations of the Decree, and pay civil penalties in the amount of 1.5 million dollars in satisfaction of the government's past claims against the City.
   Paragraphs 45-48.

This Decree was submitted to Judge Ditter on Tuesday, April 24, 1990. The judge has allotted one week for the City to sign, and an additional three weeks for other parties' signatures. After this, the Decree is subject to a 30 day public comment period prior to its entry. The effective date of the Decree and its requirements is the date of entry, unless the entry date is

later than a specific milestone date set forth in the Decree (e.g. we are bound to complete the four primary sedimentation tanks by June 1, 1990, as set forth in paragraph 8, even if the effective date of the Decree is later than that).

Please call me if you have any questions or comments, or if you need extra copies of this Decree.

ALP:sb

cc: Charisse Lilly
John Plonski
Patrick Cairo
Kumar Kishinchand
Joan Becker
Ron Coy
Bruce Aptowicz
Tom Kulesza
Bill McKeon
Eugene Gruber
Jeff Brock
Kate Ellis-Guest
Jerry Kuziw

CJG:jmb/CITYPA1/251.16

IN THE UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF PENNSYLVANIA

UNITED STATES OF AMERICA and the COMMONWEALTH OF PENNSYLVANIA,	:	
Plaintiffs,	:	
v.	:	CIVIL ACTION NO. 88-6791
CITY OF PHILADELPHIA, PENNSYLVANIA,	:	
Defendant	:	

PARTIAL CONSENT DECREE

Plaintiff, the United States of America ("United States"), on behalf of the United States Environmental Protection Agency ("EPA"), filed the complaint herein on September 1, 1988, alleging that Defendant, City of Philadelphia ("the City"), had violated the Clean Water Act, 33 U.S.C. § 1251 et seq. ("the Act"), and the conditions and limitations of National Pollutant Discharge Elimination System ("NPDES") Permit Number PA0026671.

The City owns and operates a 200 million gallon per day (200 MGD) sewage treatment plant known as the "Southwest Plant", located at 8200 Enterprise Avenue, Philadelphia, the County of Philadelphia, Pennsylvania.

The Commonwealth of Pennsylvania (the "Commonwealth") has intervened as a plaintiff in this action, pursuant to section 309(e) of the Clean Water Act, 33 U.S.C. § 1319(e), to enforce the Clean Water Act and the Pennsylvania Clean Streams Law, 35 P.S. § 691.1 et seq.

The United States, the Commonwealth and the City have consented to the entry of this Decree without trial of any issues, and the United States, the Commonwealth and the City hereby stipulate to the Court that in order to resolve the issues stated in the United States' and the Commonwealth's Complaints, this Consent Decree should be entered.

This Decree shall not constitute an admission by the City of any allegation contained in the Complaints filed by the United States or the Commonwealth in this action.

NOW, THEREFORE, it is hereby ORDERED, ADJUDGED, and DECREED as follows:

A. JURISDICTION

1. This Court has jurisdiction over the subject matter of this action and over the parties thereto, pursuant to section 309 of the Act, 33 U.S.C. § 1319, and 28 U.S.C. § 1345. The Complaint of the United States states a claim upon which relief may be granted under section 309 of the Act, 33 U.S.C. § 1319. The Commonwealth's claim in its complaint in intervention is one upon which relief against the City can be granted under sections 601 and 605 of the Pennsylvania Clean

Streams Law, 35 P.S. §§ 691.601 and 691.605, and the Court has pendent jurisdiction over the claims made under Pennsylvania law.

B. BINDING EFFECT

2. The provisions of this Consent Decree shall apply to and be binding upon the United States, the Commonwealth and the City and upon their officers, elected representatives, directors, agents, trustees, servants, employees, successors, assigns, attorneys, and all persons, firms, and corporations acting under their control or direction.

3. No later than thirty (30) days prior to transfer of ownership, operation, or other interest in the Southwest Plant, the City shall give written notice of this Consent Decree to any successors in interest. Upon transfer of ownership, operation, or other interest in the Southwest Plant, the City shall provide a copy of this Decree to any successor in interest. The City shall condition the transfer of ownership, operation or other interest upon the successful execution of the terms and conditions of this Decree. The City shall notify, in writing, the United States and the Commonwealth of any successor in interest or any transfer of operating responsibility at least 30 days prior to transfer, which notification shall include a statement of the City's compliance with the requirements of this paragraph.

C. OBJECTIVES

4. It is the express purpose of the parties in entering this Consent Decree to further the objectives of the Clean Water Act, as enunciated at section 101 of the Act, 33 U.S.C. § 1251, and of the Pennsylvania Clean Streams Law, 35 P.S. § 691.1 et seq., as enunciated in section 4 thereof. All plans, studies, construction, remedial maintenance, monitoring programs, and other obligations in this Decree, or resulting from the activities required by this Decree, shall have the objective of causing the City to achieve and remain in compliance with the Clean Water Act, and the Pennsylvania Clean Streams Law, including compliance with the terms and conditions of NPDES Permit Number PA0026671, all renewals or amendments to such Permit, and the provisions of applicable Federal and State laws and regulations governing discharges from the Southwest Plant.

D. DEFINITIONS

5. Unless otherwise defined herein, terms used in this Decree shall have the meaning given to those terms in the Clean Water Act, 33 U.S.C. § 1251 et seq., the regulations promulgated thereunder (see 33 U.S.C. § 1362 and 40 C.F.R. § 122.21), and in any applicable NPDES permit.

6. "Permit" as used herein shall mean NPDES Permit Number PA0026671, issued for the Southwest Plant, and all

revisions, modifications, amendments or reissuances of said permit that are legally enforceable against the City.

E. REHABILITATION SCHEDULE

7. The City shall undertake a program to rehabilitate and thereafter maintain the equipment at the Southwest Plant. This compliance program shall be accomplished in accordance with the schedule set forth in this section of the Decree.

8. The City shall rehabilitate a minimum of four (4) primary sedimentation tanks by June 1, 1990, and shall maintain a minimum of four (4) primary sedimentation tanks in service for at least six (6) consecutive months. An in-service primary sedimentation tank shall be defined as having a minimum of one (1) primary sludge pump, five (5) longitudinal collectors and two (2) cross collectors available for operation. The City will be allowed up to seventy-two (72) hours from the time that a piece of equipment is not in operation to remedy any failure before any primary sedimentation tank is determined to be out of service for purposes of this Decree.

9. The City shall rehabilitate a minimum of nine (9) aeration tanks by December 1, 1990, and shall maintain in service a minimum of nine (9) aeration tanks for at least six (6) consecutive months. An in-service aeration tank shall be defined as having a minimum of three (3) mixers in operation, with the proviso that the City must have four (4) mixers

available for operation in at least four (4) of the nine (9) tanks to satisfy the obligations of this paragraph. The City will be allowed up to one hundred and twenty (120) hours from the time that a piece of equipment is not in operation to remedy any failure in an individual mixer before that mixer is determined to be out of service for purposes of this Decree.

10. The City shall rehabilitate the sludge thickening system by December 1, 1990, and shall maintain it in service for at least six (6) consecutive months. An in-service sludge thickening system shall be defined as having seven (7) DAF tanks available for operation (each pair, defined by having a common sump, must have available at least one (1) operable floated sludge pump), one (1) air compressor, one (1) dilution water pump, two (2) waste activated sludge pumps and two (2) mixed sludge pumps available for operation. The City will be allowed twenty-four (24) hours from the time any piece of equipment is not in operation to remedy failures for the air compressor and the dilution water pump and seventy-two (72) hours from the time the piece of equipment is not in operation to remedy failures in DAF tanks, waste activated sludge pumps, mixed sludge pumps and floated sludge pumps before those items are determined to be out of service for purposes of this Decree.

11. The City shall rehabilitate the sludge digestion system by October 1, 1990, and shall maintain it in service for at least six (6) consecutive months. An in-service sludge

digestion system shall be defined as ten (10) sludge digesters each having an operable heat exchanger and either a sludge heating or a sludge circulating pump in service. The average monthly temperature of the in-service digesters shall be maintained at no lower than 90 degrees Fahrenheit. A minimum of two (2) digested sludge pumps on each of the north and south digester banks will be available for service. The City will be allowed up to seventy-two (72) hours from the time a piece of equipment is not in operation to remedy any failure before a piece of equipment in the sludge digestion system is determined to be out of service. If the results of the on-going digester rehabilitation program indicate that the gas mixing system must be further modified to meet the design standard for these digesters, the number of digesters in service may be reduced to nine (9), for the period of such modification only, which period shall be defined in the final report of the independent consultant, produced pursuant to paragraph 30 of this Decree.

12. The City shall rehabilitate a minimum of eighteen (18) final sedimentation tanks by January 1, 1991, and shall maintain a minimum of eighteen (18) final sedimentation tanks in service for at least six (6) consecutive months. An in-service final sedimentation tank shall be defined as having in operation six (6) longitudinal collectors, a cross collector and one (1) designated return sludge pump. The City will be allowed seventy-two (72) hours from the time any piece of equipment is out of operation to remedy any failure before

any final sedimentation tank is determined to be out of service.

13. Paragraphs 8 through 12 shall be considered separately for purposes of determining whether a violation has occurred and whether stipulated penalties are due as a result under paragraph 45 of this Decree. Separate violations of this Section E, subject to the stipulated penalties, shall be deemed to have occurred if: 1) Any of the five rehabilitation projects defined in paragraphs 8 through 12 hereof have not been completed by the deadlines designated for these rehabilitation projects in paragraphs 8 through 12, or 2) after the respective completion of each of the five rehabilitation projects defined in paragraphs 8 through 12 hereof, the requisite treatment equipment as defined in each of paragraphs 8 through 12 is not maintained "in service" (or returned to service within the time provided in each of paragraphs 8 through 12). A day of violation, for purposes of assessment of stipulated penalties, shall be each twenty-four (24) hour period, or portion thereof, in which any of the rehabilitation or maintenance requirements of paragraphs 8 through 12 hereof is not achieved.

14. The City shall be released from the stipulated penalty provisions of this Decree applicable to each of paragraphs 8 through 12 after the City has achieved six (6) consecutive months of compliance with the provisions of that particular paragraph; provided, however, that temporary, minor

deviations from such provisions, which (i) do not significantly impair the Southwest Plant's ability to provide treatment and (ii) are not indicative of any more serious failure to maintain that facility, shall not preclude EPA from exercising its discretion to find compliance under this paragraph. Release from stipulated penalties for any of the requirements of paragraphs 8 through 12 shall not release the City from the other requirements of that paragraph or from the requirements of any other of such paragraphs until such time as the City achieves six consecutive months of compliance with such other requirements. The City shall send a written certificate of compliance, in the form set forth in paragraph 68, signed by either a principal executive officer or ranking elected official or an individual having responsibility for the overall operation of the Southwest Treatment Plant, together with supporting documentation, to the United States and to the Commonwealth at any time after the City believes that it has achieved six consecutive months of compliance with the requirements of any of the paragraphs 8 through 12 hereof. The United States, after consultation with the Commonwealth, shall promptly review any such certificate, and, at its discretion, request that the City provide further information. Following the latest of (i) receipt by the United States and the Commonwealth of any such certificate, (ii) receipt of further

information requested of the City, or (iii) a statement that the City declines to provide such information, the United States, after consultation with the Commonwealth, will attempt in good faith to respond to such certificate within thirty (30) days; provided, however, that where the United States is unable to so respond it shall, within that thirty (30) day period and with no prejudice to its eventual position on such certificates, notify the City of the additional time needed for a response. In the event that the United States declines to approve any such certificate, its response shall state the reason(s) for that position. If the certificate is approved by the United States, after consultation with the Commonwealth, the City shall be released from the stipulated penalty provisions of the Decree as they relate to the paragraph with which the City has achieved compliance. If the certificate is not approved by the United States, after consultation with the Commonwealth, the City may resubmit a certificate at a later date or may submit the matter for resolution pursuant to paragraph 58 of this Decree.

F. EFFLUENT LIMITS AND MONITORING REQUIREMENTS

Interim Effluent Limits and Monitoring Requirements

15. The City shall comply with the following interim effluent limits at the Southwest Plant from the date of entry of this Decree until December 31, 1990.

PARAMETER	Monthly Ave. Concentration	Monthly Ave. Loading	Monthly Ave. % Removal
Biochemical Oxygen Demand (5-day) (BOD_5)	30 mg/l monthly ave.	-	80%*
Total Suspended Solids	30 mg/l	50,040 lbs/day	80%
First Stage Oxygen Demand (FSOD)	-	50,000 lbs/day	-
Fecal Coliform	-	200/100 ml. (all permit conditions)	-

* If FSOD is less than 37,020 lbs./day monthly average for any month in which the City fails to achieve this interim limit, no stipulated penalty shall be assessed for violations of this interim limit.

16. Monitoring and reporting requirements shall remain as required in the City's NPDES Permit for the Southwest Plant.

Final Effluent Limits

17. Beginning January 1, 1991, the City shall comply with the final effluent limits and monitoring requirements set forth in the City's NPDES Permit for the Southwest Plant.

18. Beginning January 1, 1991, the City shall be assessed stipulated penalties pursuant to paragraph 47 for violations of paragraph 17, except that for the period between January 1, 1991, and January 1, 1992, no stipulated penalties shall be assessed for violations of Biochemical Oxygen Demand (5-day) ("BOD5") mass loading or BOD percent removal effluent limitations for any month in which the City complies with final

limits for FSOD. No later than November 1, 1991, the parties shall meet to determine what, if any, additional measures are necessary to assure compliance with said BOD5 limitations, taking into consideration the then-current state of compliance with said limitations and the status of any then-pending request by the City for modifications of any or all such limitations. Prior to December 31, 1991, and at the Court's convenience, the parties shall report to the Court the outcome of these discussions, including any agreed modifications to the Decree. In the event that any request by the City for modification of said BOD5 limitations is denied by the Delaware River Basin Commission prior to November 1, 1991, the discussion process outlined in this paragraph shall commence within a month after the denial, and the United States' and the Commonwealth's right to petition the Court for additional injunctive and penalty relief with respect to the BOD5 limitations of the City's permit shall accrue two months thereafter, i.e., three months after the denial by the Delaware River Basin Commission of the City's application for modification of the BOD5 limitations.

19. The City shall be released from stipulated penalties for violations of final effluent limits and monitoring requirements after six (6) consecutive months for which the City is not assessed stipulated penalties pursuant to paragraph 18. At such time after the City believes that it has achieved six (6) consecutive months in which it has not been

assessed stipulated penalties under paragraph 18, the City shall submit to the United States and the Commonwealth a written certificate of compliance, in the form set forth in paragraph 68 of this Decree, signed by either a principal executive officer or ranking elected official or an individual having responsibility for the overall operation of the Southwest Treatment Plant. The United States, after consultation with the Commonwealth, shall promptly review any such certificate and, at its discretion, request that the City provide further information. Following the latest of (i) receipt by the United States and the Commonwealth of any such certificate; (ii) receipt of further information requested of the City, or; (iii) receipt of a statement that the City declines to provide such information; the United States, after consultation with the Commonwealth, will attempt in good faith to respond to such certificate within thirty (30) days; provided, however, that where the United States is unable to so respond it shall, within such thirty (30) day period and without prejudice to its eventual position on such certificate, notify the City of the additional time needed for response. In the event that the United States declines to approve any such certificate, its response shall state the reason(s) for that position. If the certificate is approved by the United States, after consultation with the Commonwealth, the City shall be released from the stipulated penalty provisions of paragraph 18 of the Decree. If the certificate is not approved by the

United States, after consultation with the Commonwealth, the stipulated penalty provisions will continue to apply, until such time as a certificate of compliance is approved by the United States, provided that the City may submit the matter to the Court for resolution pursuant to paragraph 58 of this Decree.

G. PRETREATMENT

20. No later than thirty (30) days after entry of this Decree, the City shall issue draft industrial user pretreatment permits containing effluent limits, monitoring and reporting requirements for the City's Belmont and Queen Lane Water Treatment Plants. The effluent limits in these permits shall be sufficient to prevent pass through or interference, as defined in 40 C.F.R. § 403, at the Southwest Plant. Such draft permits, along with supporting documentation setting forth the technical basis for the permit limits selected, shall be submitted for review to the United States, the Commonwealth, and the independent consultant hired pursuant to section I hereof.

21. The parties to the Decree shall have thirty (30) days after the issuance of the independent consultant's final report required by paragraph 31 hereof to send comments on the draft permits to the City.

22. The City shall issue final industrial user pretreatment permits to the Belmont and Queen Lane Water

Treatment Plants within ninety (90) days of receiving the independent consultant's final report, and such permits shall be consistent with the independent consultant's recommendations and with the applicable federal pretreatment statutes and regulations.

23. The City's Belmont and Queen Lane Water Treatment Plants shall comply with the effluent limits and the monitoring and reporting requirements in the final issued permits. Failure to comply with the effluent limitations contained in the final industrial user pretreatment permits shall subject the City to stipulated penalties as set forth in paragraph 48 hereof. Any discharge or release of pollutants from the Belmont or Queen Lane Water Treatment Plants that causes interference or pass through at the Southwest Plant, whether or not such discharge or release is in violation of any permit limits applicable to that Water Treatment Plant, shall subject the City to stipulated penalties as set forth in paragraph 48 hereof, for each day that such discharge or release continues.

24. The City shall be released from stipulated penalties for all violations of section G after the City has achieved compliance with all of the effluent limitations contained in the final Belmont and Queen Lane industrial user pretreatment permits through no fewer than eight (8) events by which a Belmont or Queen Lane Water Treatment Plant sedimentation tank is drained, in a minimum twelve and a

maximum eighteen month period. At such time as the City believes that it has achieved compliance with the provisions of this paragraph, the City shall submit to the United States and the Commonwealth a written certificate of compliance, in the form set forth in paragraph 68 of this Decree, signed by either a principal executive officer or ranking elected official or an individual having responsibility for the overall operation of the Southwest Treatment Plant. The United States, after consultation with the Commonwealth, shall promptly review any such certificate and, at its discretion, request that the City provide further information. Following the latest of (i) receipt by the United States and the Commonwealth of any such certificate; (ii) receipt of further information requested of the City, or; (iii) receipt of a statement that the City declines to provide such information; the United States, after consultation with the Commonwealth, will attempt in good faith to respond to such certificate within thirty (30) days; provided, however, that where the United States is unable to so respond it shall, within such thirty (30) day period and without prejudice to its eventual position on such certificate, notify the City of the additional time needed for response. In the event that the United States declines to approve any such certificate, its response shall state the reason(s) for that position. If the certificate is approved by the United States, after consultation with the Commonwealth, the City shall be released from the stipulated penalty provisions of paragraph 53

of the Decree. If the certificate is not approved by the United States, after consultation with the Commonwealth, the stipulated penalty provisions will continue to apply, until such time as a certificate of compliance is approved by the United States, provided that the City may submit the matter to the Court for resolution pursuant to paragraph 58 of this Decree.

H. BIOMONITORING

25. The City shall institute a biomonitoring program no later than 30 days after the entry of this Decree. Such biomonitoring program shall be conducted for, at a minimum, one full year, unless otherwise provided by Attachment A.

26. The City's biomonitoring program shall be conducted in accordance with the requirements set forth in Attachment A to this Decree, which is incorporated herein and enforceable hereunder.

I. REMEDIAL ACTION, STAFFING AND MAINTENANCE

27. The City shall retain an independent consultant to conduct the work specified in this section of the Decree and in the work plan. For purposes of this Decree, the work plan shall mean the "work plan-scope of work" that is Appendix 1 to the request for proposals, page 4 through 15, which is attached hereto as Attachment B. The work plan is incorporated herein by reference. The parties will attempt to

select the independent consultant by agreement of all of the parties to this Decree, based upon the independent consultant's expertise, experience, independence and availability. In the event that the parties are unable to reach agreement on the selection of an independent consultant within sixty (60) days of receipt of responses to the request for proposals issued by the City, the selection process shall proceed as described herein. The parties to the Decree will alternately strike one name from the list of contractors responding to the request for proposals, a copy of which is attached hereto as Attachment B, provided that any names may first be removed from the list by mutual agreement of all parties. For purposes of this procedure only, the United states and the Commonwealth shall jointly exercise their strike, i.e., the first strike shall be made by the United States and the Commonwealth and the second strike by the City, alternating in this fashion until only one name remains on the list. The responding contractor whose name remains on the list at the end of this process shall be selected by the City as the independent consultant to perform the work under this Decree. If this process does not produce a consultant acceptable to all parties within ninety (90) days of the receipt of responses to the request for proposals, any party may petition the Court for resolution of the dispute.

28. The City shall direct the independent consultant to proceed with the work described in this Decree, the work plan and the City's contract with the independent consultant.

no later than sixty (60) days after final selection of the independent consultant.

29. The independent consultant selected to perform work under this Decree shall be prohibited from working for any party to the Decree, or for anyone else, for purposes of challenging or promulgating an NPDES permit for the Southwest Plant, or to assist in, or defend, enforcement actions regarding compliance with the NPDES permit for the Southwest Plant, except that the independent consultant may be called as a witness by any party in any action under paragraph 58 or 59 of this Decree or to enforce this Decree. The parties shall consider including in the contract with the independent consultant a requirement that for two years after the termination of all provisions of section I of this Decree, the independent consultant shall not be retained, for any purpose, by the City's Water Department, the Water Management Division of EPA Region III or the Bureau of Water Quality Management of the Pennsylvania Department of Environmental Resources. In the event that the parties are unable to agree on the restrictions that should apply to the independent consultant, the provision for consideration set forth in this paragraph shall be the provision inserted in the contract, unless the City seeks resolution of the dispute under the provisions of paragraph 58 of this Decree. The provisions that are agreed upon shall be included in the contract between the City and the independent consultant.

30. The City shall require and the contract between the independent consultant and the City shall provide that the independent consultant shall conduct the work described in the work plan, and shall produce a draft report as described in that work plan within 120 days of receiving the direction to proceed from the City. The draft report shall be given simultaneously to all parties to this Decree, and each such party shall have thirty (30) days to submit comments on the draft report to the consultant, with copies to all other parties to the Decree. The contract with the City shall provide that the independent consultant will then have forty-five (45) days to consider and evaluate the comments submitted by the parties and to produce and distribute a final report. ~~Not less than thirty (30) days after receipt by all parties~~ of the final report, said report shall be filed by the United States with the Court and shall ~~become part of the Consent Decree and enforceable thereunder~~. Thereafter, the dispute resolution provisions contained in Paragraph 59 of this Decree shall apply should any party seek to challenge any aspect of the final report as filed with the Court. Any party's failure to raise an issue in comments on any drafts of reports by the independent consultant, or the failure of the independent consultant to adopt any party's comments in a final document, shall not, by itself, bar a party from raising such issues or comments in a dispute or enforcement action in federal court. The City shall implement the recommendations of the final

report, which shall include any amendments thereto, in accordance with the schedules for implementation included therein, and the City's failure to perform shall be subject to penalties set forth in paragraph 49. The City shall require and the City's contract with the independent consultant shall specify that the consultant shall operate in a manner consistent with section I of this Consent Decree.

31. The contract between the independent consultant and the City shall provide that the findings of the final report and the schedules for implementation of those findings shall be separately stated for the three sections of the work plan, under the headings Remedial Action, Staffing and Maintenance Management. Work items deemed by the independent consultant to be desireable but not necessary to compliance may be identified in the final report but shall not be included in any schedule for implementation that is binding upon the City. The contract shall also provide that the independent consultant shall, to the maximum extent possible, group the deadlines and requirements of the final report into two or more groups of decreasing relative priority or importance whenever such distinctions can usefully be made and shall consider the relative priority of the tasks in fixing scheduling requirements, provided that the independent consultant shall be entitled to reevaluate and recommend reordering of the relative priority or importance of binding final plan requirements and deadlines through the mechanism of the quarterly reports if

actual experience in the process of implementing the final plan so dictates. Any such reevaluation or recommended reordering of priorities under this paragraph shall not by itself revise or modify the enforceable schedules of the final report.

32. The City shall require and the contract with the City shall provide that after the filing of the final report with the Court, the independent consultant shall commence evaluations of the City's compliance with the findings and schedules contained in the final report filed with the Court. The contract shall further provide that such reviews of the City's compliance by the independent consultant shall continue until the City is released pursuant to Paragraph 40 from obligations arising under this section I of this Decree. The contract shall further provide that the independent consultant shall prepare quarterly reports for submission to all parties, which reports shall be submitted by the last day of the month following the completion of each calendar quarter.

33. The contract with the City shall provide that the independent consultant's quarterly reports shall make an independent assessment of the City's efforts to comply with requirements of the final report and shall include, at a minimum: (a) an assessment of the City's compliance with requirements and deadlines of the final report that were to have been implemented during that reporting period; (b) an assessment of the City's progress toward meeting the requirements that are to be implemented in the future; and (c) an

evaluation of the reasons for any violations reported in the City's Discharge Monitoring Reports. The independent consultant's quarterly reports shall, to the extent possible, specifically assess the relative importance, within the context of the final plan as a whole, of the City's extent of compliance or noncompliance with each requirement or deadline that was to have been implemented or achieved during the reporting period. The independent consultant's quarterly reports shall also attempt to assess and evaluate the cause or causes of any delay or failure fully to implement or achieve any such requirement or deadline, and shall, whenever possible, evaluate the likely consequences and relative importance of any such delay or failure with respect to its effect on the City's ability to achieve and maintain long term compliance at the Southwest Plant. The independent consultant shall not, however, offer an opinion on the ultimate issue of the City's achievement or failure to achieve substantial compliance with the applicable quarterly requirements and deadlines of the final plan, which finding is specifically reserved to the United States, after consultation with the Commonwealth, and to the Court should the City file a petition pursuant to paragraph 58 hereof to resolve a dispute regarding the United States' finding.

34. All quarterly reports from the independent consultant shall be submitted simultaneously to all parties to the Decree. Any party may comment on the report by submitting

comments to the United States with a copy to all other parties to the Decree. The failure by any party to comment on or object to any aspect of the quarterly report written by the independent consultant shall not be construed as an endorsement of that aspect of the report.

35. The City shall require and the contract with the City shall provide that the independent consultant is not permitted to consider, in determining necessary actions or the schedules for implementing those actions in either the final report or the quarterly reports, any political, bureaucratic or financial limitations on the City, except those management, legal or cost/benefit considerations that are generally applicable in the management of large municipal wastewater treatment plants. These generally applicable considerations and limitations shall not be defenses to the City's failure to comply with requirements set forth in sections other than I of this Decree, except to the extent available in the absence of this paragraph. If the City believes that it cannot, or should not be required to, implement a particular action in the final report or to implement such actions on a particular schedule, because of such restraints that the independent consultant is not permitted to consider, the City may state such views in its comments on the draft report or the quarterly reports prepared by the independent consultant. Those comments may be considered by the United States, in consultation with the

Commonwealth, in making determinations regarding compliance under paragraph 37 hereof.

36. The City's contract with the independent consultant shall provide that time is of the essence in the performance of the contract and shall provide for termination of the contract in the event that the independent contractor fails to perform adequately under the contract. Such provision may only be exercised upon agreement of all parties or upon order of the Court after petition by any party.

37. Within sixty (60) days of receiving the third quarterly report, and each quarterly report thereafter, the United States shall make a finding, after consultation with the Commonwealth, whether the City is in substantial compliance with the requirement of paragraph 30 to implement the final report, and shall state such finding in writing. A separate finding shall be made by the United States with respect to each of the three elements of the final report: Remedial Action, Staffing, and Maintenance Management. The sixty (60) day review period may be extended by the United States if information needed by the United States to make its finding is not provided promptly by the City.

38. If the United States determines, after reviewing the third or any subsequent quarterly report, that the City is not in substantial compliance with the requirements of the Decree, the United States will issue a finding setting forth that determination and stating the reasons therefor.

39. If the City disputes any finding of noncompliance made pursuant to paragraphs 37 and 38 of this Decree by the United States, the City may petition the Court under the dispute resolution provision set forth under Paragraph 58 of the Decree.

40. The City will be released from all provisions and liability for stipulated penalties arising under this section I as to each element separately after the United States or the Court finds, under the provisions of paragraphs 37, 38 and 39 of this Decree, that the City has substantially complied with the requirements of each element of the final report for four out of five consecutive quarters.

J. ENVIRONMENTAL CONFERENCE COMMITTEE

41. The parties to this Consent Decree have agreed to form an environmental conference committee, which shall consist of one or more designated representatives from each of the three parties to the Decree. The committee shall meet to discuss selection of the independent consultant under this Decree and to review the draft report issued by the independent consultant with the independent consultant pursuant to paragraph 30 of this Decree. The committee may meet on such additional occasions as the participants select, to review the progress of compliance with the Decree. A meeting of the environmental conference committee may be called by agreement of any two of the three parties. The committee shall not have

the authority to take any actions, except by unanimous consent of all parties to the Decree and as limited by the Decree.

K. FUNDING

42. Performance of the terms of this Consent Decree by the City is not conditioned on the receipt of any Federal or Commonwealth grant or other funds. In addition, the City's performance is not excused by the failure to obtain, or by the shortfall of any, Federal or Commonwealth grant or other funds, or by delays in the processing of any applications for same.

L. REPORTING

43. Beginning with the first full calendar quarter following entry of this Decree and for every calendar quarter thereafter until each of the City's obligations terminates pursuant to section BB, the City shall submit in writing to the United States, the Commonwealth and the independent consultant a report containing at a minimum the following information: (a) the status and progress of work required under paragraphs 8 through 12 of this Decree, in sufficient detail to allow review of the operating status of each of the components listed in paragraphs 8 through 12, (b) any anticipated delays in implementing the requirements of the final report prepared pursuant to paragraph 30, (c) information as to compliance or noncompliance with the applicable effluent limitations and reasons therefore, (d) information as to compliance or non-compliance with pretreatment permits issued under paragraph 11

of this Decree, and reasons therefore, and (e) notifications of the actions required pursuant to paragraphs 22, 25, 27 and 28. Upon request, the City shall automatically be entitled to one five (5) day extension of the deadline for submission of any such report. Notification to the United States or the Commonwealth pursuant to this section of any anticipated delay shall not, by itself, excuse the delay.

44. The reports required in paragraph 43 hereof shall be submitted within forty five (45) days following the last day of each calendar quarter.

M. STIPULATED PENALTIES

45. If the City fails to comply with any of the requirements of paragraphs 3, 8-12, 22, 25-26, 28, 43, 44, 57 or 60 of this Decree, the City, upon demand by the United States after consultation with the Commonwealth, shall pay stipulated civil penalties as follows:

Period of Failure to Comply	Penalty
1st to 30th day	$ 500.00/day per violation
31st to 60th day	$1,000.00/day per violation
After 60 days	$2,000.00/day per violation

46. The City, upon demand by the United States after consultation with the Commonwealth, shall pay the following stipulated civil penalties for non-compliance with the interim effluent limitations contained in paragraph 18 of this Consent Decree.

Violation of Each Parameter	Penalty
Monthly Average Concentration Limit	$10,000.00 per month per parameter
Monthly Average Loading Limit	$10,000.00 per month per parameter
Monthly Average Percent Removal	$10,000.00 per month per parameter

47. If the City fails to achieve full compliance with the requirements of paragraphs 17 and 18 of this Decree after January 1, 1991, the City shall, upon demand by the United States after consultation with the Commonwealth, incur stipulated penalties as set forth in this paragraph.

(a) For TSS loading, TSS concentration, TSS percent removal, BOD5 concentration and FSOD loading monthly average limitations, the stipulated penalty for each parameter shall be $10,000 per parameter for each month of violation, but $20,000 per parameter per month for the second consecutive and any subsequent consecutive month of violation.

(b) For BOD5 loading monthly average and BOD5 percent removal violations, the stipulated penalty shall be $5,000 per violation per month. No stipulated penalties shall be assessed for violation of these requirements or for violation of any BOD5 loading weekly average limitations in any month for which the City is in compliance with the permit's monthly average FSOD loading effluent limitation.

(c) For all other violations of the City's NPDES permit not covered by subparagraphs (a) and (b) above, stipulated penalties shall be as follows:

Type of Violation	Penalty
Weekly Average Violation	$ 2,500 per week
pH	$ 3,000 per day
Fecal coliform - monthly geometric average violation	$10,000 per month, plus $1,000 for each exceedance of the requirement that no more than 10 percent of the samples exceed 1,000/per 100ml.
Instantaneous maximum violation	$1,000 per day

The penalties under this paragraph are in addition to any other penalty that may be incurred under the provisions of this Decree.

48. If the City fails to comply with any of the effluent limits contained in the final industrial user pretreatment permits issued by the City to the Belmont and Queen Lane Water Treatment Plants, the City shall, upon demand by the United States after consultation with the Commonwealth, incur stipulated penalties of $1,000 per day that such violations continue. If a discharge or release of pollutants from the Belmont or Queen Lane Water Treatment Plants causes interference or pass through at the Southwest Plant, the City shall pay stipulated penalties of an additional $1,000 per day that such discharge or release continues. Stipulated penalties for pass through or interference shall be in addition to stipulated penalties for violations of the interim or final effluent limitations applicable to the Southwest Plant.

49. For each quarter in which the United States determines, under the provisions of paragraph 37 hereof, that the City is not in substantial compliance with the requirement of the Decree to implement the final report, the City shall pay stipulated penalties of $15,000 per quarter for each element (i.e., Remedial Action, Staffing, and Maintenance Management) as to which the United States makes a finding of noncompliance, i.e., for a maximum quarterly stipulated penalty under this paragraph of $45,000.

50. Following any demand by the United States after consultation with the Commonwealth, that is not timely contested by the City, any stipulated penalties incurred by the City shall be paid 50% to the United States and 50% to the Commonwealth by cashier's check. In the case of the United States, the check shall be payable to "Treasurer of the United States," and tendered to the Chief of the Civil Division, United States Attorney's Office for the Eastern District of Pennsylvania, Suite 1300, 615 Chestnut Street, Philadelphia, PA 19106. In the case of payments to the Commonwealth, the cashier's check shall be made payable to the "Commonwealth of Pennsylvania, Clean Water Fund," and shall be tendered to the Regional Environmental Protection Manager, Bureau of Water Quality Management, Pennsylvania Department of Environmental Resources, 1875 New Hope Street, Norristown, PA 19401. A copy of the letter and both checks shall be sent to the United States, the Commonwealth, and the Regional Hearing Clerk, U.S. EPA Region III, 3RC00, 841 Chestnut Street,

Philadelphia, PA 19107. Stipulated penalties incurred under this Decree shall be tendered within sixty (60) days of the City's receipt of the demand, unless the City timely contests the demand pursuant to section N or paragraph 58 of this Decree. If the City invokes the dispute resolution provisions of paragraph 58, the stipulated penalties subject to that dispute shall be paid to the United States and the Commonwealth within sixty (60) days after the dispute is resolved or the Court renders a decision on the dispute, whichever is earlier. Stipulated penalties for any continuing violation shall continue to accrue during the resolution of any dispute.

N. DELAYS OR IMPEDIMENTS TO PERFORMANCE

51. The City shall notify, in writing, the United States and the Commonwealth that a milestone has not been achieved: (a) no later than thirty (30) days after any missed milestone date expressly set forth in paragraphs 8 through 12, 20, 22, 25, and 28, or (b) in the City's comments, pursuant to paragraph 34, on the independent consultant's quarterly reports regarding milestone dates set forth in the final report with which the City is required to comply by paragraph 30 of this Decree. The notices shall specifically reference this paragraph of the Decree and shall describe in detail the anticipated length of time the violation may persist, the precise cause or causes of the violation, the measures taken

or to be taken by the City to prevent or minimize the violation as well as to prevent future violations, and the timetable by which those measures will be implemented. The City shall adopt all reasonable measures to avoid or minimize any such delay. Failure by the City to comply with the notice requirements of this paragraph shall render this paragraph void and of no effect as to the particular incident involved, and shall constitute a waiver of the City's right to obtain an extension of time for its obligations under this paragraph based on such event.

52. If the City claims, and the United States agrees, after consultation with the Commonwealth, that any violation of any effluent limitation or other provision of this Decree or any delay in achieving any milestone set forth herein has been caused entirely by circumstances beyond the control of the City and that the City could not reasonably have foreseen and prevented such violation, the time for performance of such requirement shall be extended for a period not to exceed the total actual delay resulting from such circumstance, and stipulated penalties shall not be due for said delay or violation. In the event the parties are unable to agree, the City may submit the matter to the Court for resolution pursuant to paragraph 56 of this Decree.

53. The United States shall notify the City in writing of the United States' agreement or disagreement with the City's claim of delay or impediment to performance as

promptly as is practicable and, at its discretion, request that the City provide further information. Following the latest of (i) receipt by the United States and the Commonwealth of any such claim, (ii) receipt of further information requested of the City, or (iii) receipt of a statement that the City declines to provide such information, the United States will in good faith attempt to respond to such claim within thirty (30) days; provided, however, that where the United States is unable to so respond it shall within that thirty day period and with no prejudice to its eventual position on such claim, notify the City of the additional time needed for response. In the event that the United States declines to approve any such claim, its response shall state the reason(s) for that position. If the City submits the matter to the Court for resolution and the Court determines that the violation was caused entirely by circumstances beyond the control of the City and that the City could not reasonably have foreseen and prevented such violations, the time for performance of such requirement shall be extended for a period not to exceed the total actual delay resulting from such circumstances, and stipulated penalties shall not be due for said delay or violation.

54. Unanticipated or increased costs or expenses associated with the implementation of this Decree, changed financial circumstances, or alleged technical infeasibility of meeting NPDES effluent limitations shall not, in any event,

serve as a basis for changes in this Decree or extensions of time under this Decree.

55. Compliance with any requirement of this Decree shall not, by itself, constitute compliance with any other requirement of this Decree. An extension of one compliance date based on a particular incident shall not necessarily result in an extension of a subsequent compliance date or dates. The City must make an individual showing of proof regarding each delayed incremental step or other requirement for which an extension is sought.

56. The City shall bear the burden of proving that any delay or violation of any requirement of this Consent Decree was caused entirely by circumstances beyond the control of the City and that the City could not reasonably have foreseen and prevented such violation. The City shall also bear the burden of proving the duration and extent of any delay or violation attributable to such circumstances.

O. PENALTY FOR PAST VIOLATIONS

57. The City shall pay a civil penalty in the amount of $1,500,000.00, with interest at 7.25%, in full satisfaction of the United States' and the Commonwealth's claims for the City's violations of the Clean Water Act, the Pennsylvania Clean Streams Law, and the NPDES permit, as set forth in the Complaints filed herein through the date of entry of this Decree. Payment shall be made in three (3) installments due

sixty (60) days, one (1) year, and two (2) years after entry of this Decree of $500,000, $572,500 and $536,250 respectively. In consideration of the above penalty, the United States and the Commonwealth waive the right to seek civil or administrative penalties in addition to those set forth in this Decree for violations of the City's NPDES Permit that predate the entry of this Decree.

Payments shall be transmitted as follows:

(a) The City shall tender one cashier's check on or before each payment date for 67% of the amount set forth above, payable to the "Treasurer of the United States" to the Chief of the Civil Division, United States Attorney's Office for the Eastern District of Pennsylvania, Suite 1300, 615 Chestnut Street, Philadelphia, Pennsylvania 19106. A copy of the check and the letter tendering such check shall be sent to the Commonwealth.

(b) The City shall tender one cashier's check on or before each payment date for 33% of the amount set forth above, payable to the "Commonwealth of Pennsylvania, Clean Water Fund," to the Regional Environmental Protection Manager, Bureau of Water Quality Management, Pennsylvania Department of Environmental Resources, 1875 New Hope Street, Norristown, Pennsylvania 19401. A copy of the check and the letter tendering such check shall be sent to the United States.

P. DISPUTE RESOLUTION

58. If the parties are unable to agree upon any plan, procedure, standard, requirement, approval, disapproval, finding, or other matter described herein, or in the event a dispute should arise among the parties regarding the implementation of the requirements of this Decree, the City shall follow or comply with the position of the United States as set forth in writing pursuant to paragraphs 14, 19, 24, 37, 38, 40 and 53, section I or any other provision of this Decree, unless the City files a petition with the Court for resolution of the dispute within thirty (30) days of receipt of the United States' position. The petition shall set out the nature of the dispute and shall include a proposal for its resolution. The City shall bear the burden of proof on any such petition. The United States shall have thirty (30) days to file a response, which may contain an alternate proposal for resolution. The City shall have fifteen (15) days from receipt of the United States' response to file a reply. These filings shall constitute the record for purposes of resolving the dispute, and no additional evidence may be submitted, except upon order of the Court. In all other respects not inconsistent with this provision, the Federal Rules of Civil Procedure shall apply. At any time prior to the filing of said petition with the Court, any party may refer the dispute to the Environmental Conference Committee for informal, nonbinding discussion in aid of settlement. Such referral shall be effective for a period

of thirty (30) days unless all parties enter into a stipulation extending its duration, and all deadlines contained in this paragraph, including without limitation the deadline for filing of a petition with the Court, shall be stayed during the effective period of said referral.

59. In the event any party desires to modify the final report, produced pursuant to paragraph 30 hereof, such party shall file a petition with the Court, which shall set forth the grounds for the modification. The petitioning party shall bear the burden of proof. Any other party may file a response within thirty days, and the petitioning party may file a reply 15 days thereafter. In all other respects not inconsistent with this provision, the Federal Rules of Civil Procedure shall apply.

Q. RIGHT OF ENTRY

60. Until termination of this Consent Decree, the United States and the Commonwealth, and their representatives, contractors, consultants, and attorneys, shall have the authority to enter any facility covered by this Decree, at all times, upon proper presentation of credentials to the manager or managers of the facility or, in the manager's absence, to the highest ranking employee present on the premises, for the purposes of:

(a) monitoring the progress of activities required by this Decree;

(b) verifying the data or information submitted to the United States and the Commonwealth in accordance with the terms of the Decree;

(c) obtaining samples, and, upon request, splits of any samples taken by the City or its consultants;

(d) assessing the City's compliance with this Decree; and

(e) reviewing and copying any and all records pertaining to the Southwest Plant.

Nothing in this section shall be construed to limit the United States' or the Commonwealth's right of access pursuant to the Clean Water Act, the Clean Streams Law, any other Federal or Commonwealth law, or the City's NPDES permit.

R. COMMONWEALTH'S CONTINGENT LIABILITY

61. This Decree does not resolve any contingent liability of the Commonwealth under section 309(e) of the Act, 33 U.S.C. § 1319(e), for payment of any judgment, or any expenses incurred as a result of complying with any judgment, entered against the City, to the extent that the laws of the Commonwealth prevent the City from raising revenues needed to comply with such judgment. The United States reserves its claims against the Commonwealth under section 309(e) of the Act, 33 U.S.C. § 1319(e), and the Commonwealth reserves its defenses to those claims.

S. NOT A PERMIT

62. This Consent Decree is not and shall not be interpreted to be a permit, or a modification of an existing permit, issued pursuant to section 402 of the Clean Water Act, 33 U.S.C. § 1342, nor shall it in any way relieve the City of its obligation to obtain a permit and to comply with the requirements of the permit or with any other applicable Federal or Commonwealth law or regulation.

T. FAILURE OF COMPLIANCE

63. The United States and the Commonwealth do not, by their consent to the entry of this Decree, warrant or aver in any manner that the City's complete compliance with this Decree will result in compliance with the provisions of the Clean Water Act, 33 U.S.C. § 1251 et seq., or NPDES permit No. PA0026671. Notwithstanding the United States' and the Commonwealth's review and approval of any plans formulated pursuant to this Consent Decree, the City shall remain solely responsible for compliance with the terms of the Act, this Decree, and the City's NPDES permit.

U. NON-WAIVER PROVISIONS

64. This Consent Decree in no way affects or relieves the City of responsibility to comply with any Federal, Commonwealth, or local law or regulation.

65. The United States and the Commonwealth waive the right to seek civil penalties over and above the stipulated penalties set forth in this Decree for violations of the permit or this Decree that are covered by such stipulated penalties, except as set forth in paragraph 66 below.

66. The United States and the Commonwealth expressly reserve the right to:

(a) seek injunctive relief against the City for any violations of this Decree or for violations of law not covered by this Decree;

(b) seek criminal penalties for any violations of law;

(c) institute civil or criminal contempt proceedings against the City for violations of this Decree;

(d) petition this Court for whatever additional injunctive and penalty relief they deem necessary, including penalties up to the statutory maximum, in order to assure compliance with the BOD5 effluent limitations of the City's permit, in accordance with the provisions of paragraph 18 of this Decree; and

(e) seek civil penalties against the City for discharges from outfall number 001 of the Southwest Plant that cause (i) demonstrable and serious harm to the aquatic life of the receiving waters, or; (ii) demonstrable and serious violation of any numeric water quality standard applicable to

the receiving waters and applied to the Southwest Plant by the permit.

V. COSTS OF SUIT

67. Each party shall bear its own costs and attorney's fees in this action.

W. FORM OF NOTICE AND CERTIFICATES OF COMPLIANCE

68(a). Except as specified otherwise, when written notification to or communication with the United States, the City, or the Commonwealth is required by the terms of this Consent Decree, it shall be addressed as follows:

As to the United States:

Chief, Civil Division
U.S. Attorney's Office
Suite 1300
615 Chestnut Street
Philadelphia, PA 19106

Chief, Environmental
Enforcement Section
Land and Natural Resources
Division
Department of Justice
10th & Pennsylvania Ave.
Washington, D.C. 20530

John Trainer
Permit Enforcement Branch
Compliance Section
Water Division
U.S. Environmental
Protection Agency
841 Chestnut Street
Philadelphia, PA 19107

As to the Commonwealth:

Environmental Protection Manager,
Bureau of Water Quality
Management
PA. Department of Environmental
Resources
1875 New Hope Street
Norristown, PA 19401

As to the City:

Abby L. Pozefsky
Divisional Deputy City Solicitor
City of Philadelphia
Water Department
5th Floor ARA Tower
1101 Market Street
Philadelphia, PA 19107

Any party may change the identity of persons to whom notifications must be sent under this paragraph by notifying all other parties to the Decree, in writing, of the change.

68(b). The written certificate of compliance required in paragraphs 14, 19 and 24 of this Decree shall be in the following form:

> I certify that the information contained in or accompanying this certificate of compliance is true, accurate and complete. As to the portions of this certificate of compliance for which I cannot personally certify truth and accuracy, I certify as the official having supervisory responsibility for the person(s) who, acting under my direct instructions, made the verification, that this information is true, accurate and complete.
>
> [signature] _____
> Title

69. Notifications to the United States, the Commonwealth or the City shall be deemed submitted on the date

they are postmarked and sent by certified mail, return receipt requested.

X. MODIFICATION

70. Except as provided herein or by action of this Court, there shall be no modification of this Consent Decree without written agreement of all of the parties to this Consent Decree and approval by the Court. The United States reserves the right to seek a modification of this Decree to conform to any requirements that become applicable by reason of any revision to the Clean Water Act and/or its implementing regulations.

Y. PUBLIC COMMENT

71. The parties agree and acknowledge that final approval by the United States and entry of this Decree is subject to the requirements of 28 C.F.R. § 50.7, which provides for notice of the lodging of this Consent Decree in the Federal Register, an opportunity for public comment, and consideration of any comments.

Z. CONTINUING JURISDICTION OF THE COURT

72. The Court shall retain jurisdiction to enforce the terms and conditions of this Decree and to resolve disputes arising hereunder as may be necessary or appropriate for the construction or execution of this Decree.

AA. SEVERABILITY

73. The provisions of this Decree shall be severable, and should any provision be declared by a court of competent jurisdiction to be inconsistent with federal law, and therefore unenforceable, the remaining provisions of this Decree shall remain in full force and effect.

BB. TERMINATION

74. This Consent Decree shall terminate as provided in paragraph 14 with respect to the City's obligations arising under each of paragraphs 8 through 12 and related stipulated penalties.

75. This Consent Decree shall terminate on December 31, 1990, with respect to the City's obligations arising under paragraph 15 and any related stipulated penalties.

76. This Consent Decree shall terminate as provided in paragraph 24 with respect to the City's obligations arising under section G and any related stipulated penalties.

77. This Consent Decree shall terminate as provided in paragraph 40 with respect to the City's obligations arising under section I and any related stipulated penalties.

78. With respect to all other obligations and penalties arising under this Consent Decree, this Decree shall terminate:

(a) After payment of all penalties determined to be due and owning hereunder; and,

(b) In accordance with the terms of paragraph 19.

APPROVED AND ENTERED this day of , 1990.

J. WILLIAM DITTER, JR.
UNITED STATES DISTRICT JUDGE

WE HEREBY CONSENT to the entry of this Decree. Entry is subject to the public notice requirements of 28 C.F.R. § 50.7.

FOR THE CITY OF PHILADELPHIA:

JOHN PLONSKI
Water Commissioner
City of Philadelphia

ABBY L. POCEFSKY
Divisional Deputy City Solicitor
City of Philadelphia

FOR THE UNITED STATES OF AMERICA:

RICHARD B. STEWART
Assistant Attorney General
Land and Natural Resources Divis
United States Department of Just

MICHAEL M. BAYLSON
United States Attorney
Eastern District of Pennsylvania

CYNTHIA J. GILES
Assistant United States Attorney

FOR THE COMMONWEALTH
OF PENNSYLVANIA:

WILLIAM HUTCHINS
United States Department of
Justice
Land and Natural Resources
Division

MARTHA BLASBERG
Assistant Counsel
Commonwealth of Pennsylvania
Department of Environmental
Resources
Eastern Region Office of Chief
Counsel

JAMES M. STROCK
Assistant Administrator for
Enforcement and Compliance
Monitoring
U.S. Environmental Protection
Agency

LEON T. GONSHOR
Commonwealth of Pennsylvania
Department of Environmental
Resources
Regional Director
Norristown Regional Office

MARCIA E. MULKEY
Regional Counsel
Environmental Protection Agency
Region III

JED CALLEN
Assistant Regional Counsel
U.S. Environmental Protection
Agency
Region III

DANIEL PALMER
EPA Office of Enforcement and
Compliance Monitoring

ATTACHMENT A

Biomonitoring Requirements

The City shall initiate a twelve-month biomonitoring program to assess the potential toxicity of the effluent on the aquatic life in the receiving stream. As a minimum, the following requirements shall be met in conducting this program:

1. Toxicity tests shall be conducted on Ceriodaphnia and Fathead Minnow. Twenty-four hour composite samples shall be taken for seven consecutive days each month. Each composite shall be used as daily renewal water for the seven day chronic tests. The chronic toxicity test using both organisms will be conducted simultaneously for the first two (2) months; thereafter toxicity tests shall be conducted on the more sensitive organism only if it is clear that the same species is more sensitive in samples for both months, otherwise testing will continue for both species.

2. For each 24-hour composite sample taken, a chemical analysis of the sample shall be provided for BOD5 and suspended solids.

3. The chemical monitoring required in the NPDES permit for the Southwest Plant shall be conducted on at least one composite sample/month used in the biomonitoring tests.

4. Only chronic tests shall be conducted. The test procedures (including quality assurance) to be used are described in EPA's Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA 600/4-89/001). The 0.5 dilution factor series shall be used in the toxicity testing.

5. Dilution water shall be obtained from a flow weighted composite of the raw water intakes servicing this facility. If the dilution water shows any toxicity, separate chronic tests shall be conducted from each of the sources of dilution water and the City shall submit a plan proposing the use of alternative sources of dilution water which are representative of the raw water intakes.

and, upon approval of EPA and DER, shall implement the plan. Should further testing from the alternative sources of dilution water continue to show toxicity, monthly wastewater plant effluent toxicity tests shall be terminated.

6. Separate tests shall be conducted on the treated effluent prior to chlorination and on the chlorinated effluent.

7. Commencement of sample collection per item (1) shall be at a time when there is minimal storm drainage inflow to the collection system. A description of the degree of inflow at the time of sample collection shall be provided.

8. All test results shall be reported, as well as the calculated effect levels as prescribed in EPA methods manual, along with monthly Discharge Monitoring Reports.

TRP Requirements

1. If, for the prechlorinated samples, the No Observed Effect Level (NOEL) is less than 12.5% effluent by volume for two consecutive monthly tests or for any three tests within one year, the City shall submit a Toxicity Reduction Plan (TRP) to EPA and the Commonwealth within 90 days of the test result that triggered this requirement.

2. If the NOEL is less than 12.5% effluent by volume for only the chlorinated samples for two consecutive monthly tests or for any three tests within one year, the City shall submit a chlorine minimization plan to EPA and the Commonwealth within 90 days of the test result that triggered the chlorine minimization plan requirement.

ATTACHMENT B

APPENDIX 1

WORK PLAN - SCOPE OF WORK

I. Purpose

The purpose of the independent consultant's work is to identify factors that have limited performance at the Southwest Water Pollution Control Plant and to develop a specific sequenced program for corrective actions to existing unit processes that will result in consistent long-term compliance with the applicable NPDES permit at the Southwest Plant. In addition, through a series of periodic reports, the consultant shall monitor in three areas the City's progress in implementing the proposed program of corrective actions.

II. Methodology

The consultant shall evaluate the conditions that exist at the Southwest Plant and develop specific corrective measures for each of the unit processes identified in Attachment 1 to this Request for Proposal, that can be implemented to ensure consistent, long-term compliance with NPDES permits issued for this facility. The consultant shall also periodically evaluate the City's effort to implement these corrective actions.

The consultant shall review factors that may have contributed to non-compliance at Southwest, and shall develop short and long-term corrective measures. A report summarizing the findings of this review will be submitted to the City, EPA and PaDER (the Pennsylvania Department of Environmental Resources) within 120 days

of the notice to proceed. This report will separately address recommendations and sequenced schedules for corrective actions in each of the following areas:

(1) Remedial Action

(2) Staffing and;

(3) Maintenance Management.

Thereafter, the consultant shall prepare quarterly reports that shall evaluate and summarize the City's efforts with respect to implementing the corrective actions identified in the final report in the areas of Remedial Action, Staffing and Maintenance Management.

III. Evaluations and Recommendations

The tasks identified under this section will provide for a review of the factors that may have contributed to non-compliance at the Southwest Plant along with the development of corrective measures aimed at ensuring consistent, long-term compliance with NPDES permit limitations.

Task A - Review Basis of Design

The consultant shall review the original basis of design for the Southwest Water Pollution Control Plant, along with the effect of any additional loadings that may have resulted from the decision to construct centralized sludge handling facilities at this plant. The review shall include all of the unit processes listed on Attachment 1 of this Request for Proposal. A summary of the current basis of design shall be developed. The summary shall include a solids balance for the entire plant.

Task B - Preliminary Unit Process Operations Review

The consultant shall review the operating records for each of the unit processes and subsystems identified in Attachment 1. The present operating conditions will be compared to those assumed in the basis of design. Significant variations from the conditions assumed in the basis of design shall be discussed in the consultant's report. This discussion shall address the effect that these variations may have had on the Plant's effluent quality.

The consultant shall prepare a summary identifying the percentage of time each unit or subsystem was available for operation from January of 1984 to present. Factors that precluded the use of equipment shall be identified, and to the extent that these factors and the resulting unavailability of equipment affected plant performance, they should be addressed in Task C.

Task C - Factors Affecting Compliance

Using all available information, the consultant will identify and discuss all major factors that adversely affected the performance of the Southwest Plant since January of 1984. To the extent that examination of records or information prior to 1984 is necessary to achieve this goal, such records shall be made available to the independent consultant. Factors that will be considered during the course of this evaluation include:

I. Wastewater Characteristics

   A. Sampling, testing and metering procedures

   B. Influent characteristics

   C. Peak Flow rates

D. Industrial wastes - both slug releases and continuous discharges from industry, including sludge from the City's water plants

E. Impacts of recycle flows

II. Design related problems

A. Inadequate back-up or redundant units

B. Material specifications (e.g. proper type pump or corrosion resistant material)

III. Plant Operations

A. Process control procedures

B. Sludge dewatering operations as well as all discharges from the SPDC to Southwest Plant.

IV. Maintenance Management

A. Preventive and corrective maintenance

B. Spare parts inventory and procurement system

C. Contracting procedures and policy for repairing or replacing down equipment

V. Labor and Staffing Considerations

A. Effect of any deficiency in the number, skills or job classifications of operation and maintenance personnel

B. Effect of outside contractors assisting in plant operation

C. Effect of union contract and work rules on plant operation and maintenance

Task D - Review of City's Plans

The independent consultant shall review the City's Southwest Remedial Action Plan dated December 8, 1988, together with any

amendments to the plan effective as of the date that the independent consultant initiates its work. This document provides an initial plan that details the measures the City believes are necessary to rehabilitate all of the essential unit processes at Southwest.

The independent consultant shall review the City's current staffing plan and the existing maintenance management system to determine if they are sufficient to achieve the objective of consistent, long-term compliance with the NPDES permit applicable to the Southwest Plant utilizing existing unit processes.

The independent consultant shall also review the draft pretreatment permits the City issues to the Belmont and Queen Lane water treatment plants and the City's plan for controlling the release of solids to prevent "pass through or interference" at the Southwest Plant. The consultant shall determine if the plan and applicable permit will prevent these solids from passing through or causing interference with the operation of the Southwest Plant.

Task E - Conclusions

Based on an evaluation of the information developed in previous tasks, the consultant shall:

1. Determine whether the corrective actions and schedules outlined in the City's planned corrective actions are realistic and will allow the Southwest Plant to achieve compliance with its NPDES permit in an expeditious manner. If not, the consultant shall develop revisions to the plan, or identify additional remedial actions or schedules it believes would result in compliance.

2. Determine whether the City's labor and staffing plan will provide trained personnel with the correct skill mix to implement the remedial actions along with the day-to-day operation and maintenance functions required for compliance.

3. Determine if the existing maintenance management system is sufficient to ensure the proper operation of all equipment necessary to achieve and maintain consistent, long-term compliance at Southwest.

The consultant shall provide specific corrective measures and sequenced schedules in each of the areas 1-3 identified above. Any additional corrective measures shall be integrated with the City's proposed measures that are acceptable to the consultant.

The independent consultant shall determine if the provisions of the draft pretreatment permits issued to the Belmont and Queen Lane Water Treatment Plants, and the plan for controlling releases of solids from those facilities, are sufficient to prevent pass through or interference violations. If the independent consultant determines that either the plan or the permit is not adequate to prevent pass through or interference, the independent consultant shall recommend revisions to the plan and/or the permits so that they do adequately prevent pass through or interference.

A draft report summarizing the consultant's findings shall be submitted to the City, EPA and PaDER within 120 days of receiving direction to proceed from the City. All preliminary drafts, or portions thereof, shall be distributed concurrently to the City,

EPA and PaDER. Single party review or revisions of any portion of this report shall not be allowed.

The report shall include a specific and detailed listing of the actions that should be taken to improve the performance of the Southwest Plant, including any actions planned by the City that are approved by the independent consultant.

The report shall discuss activities relating to remedial actions, staffing and maintenance management in separate sections. The report shall also contain sequenced schedules setting forth the dates(s) by which specific actions shall be commenced and the date(s) by which the actions shall be completed. Sufficient detail with respect to both the description of the corrective action activity and the schedule for completion of that activity shall be included to provide for subsequent monitoring and enforcement on the basis of an evaluation of whether the City has substantially compiled with the consultant's recommendations.

Work items deemed by the consultant to be desirable but not necessary to compliance may be identified in the report but shall not be included in any schedule for implementation that is binding upon the City. The independent consultant shall, to the maximum extent possible group the deadlines and requirements of the report into two or more groups of decreasing relative priority or importance whenever such distinctions can usefully be made and shall consider the relative priority of the tasks in fixing scheduling requirements. The consultant shall be entitled to reevaluate and

recommend reordering of the relative priority or importance of binding final plan requirements and deadlines through the mechanism of the quarterly reports if actual experience in the process of implementing the final plan so dictates. However, any such reevaluation or recommended reordering of priorities will not by itself revise or modify the enforceable schedules of the final report.

The report will include estimates as to the costs of implementing each of the corrective measures, and the effect, if any, on effluent quality of a particular corrective measure.

The City of Philadelphia, EPA and PaDER will review the draft report, and provide written comments back to the consultant within 30 days of receipt. To the extent practicable, the consultant shall address these comments in the final report which shall be issued within 45 days of receipt of the responsive comments. Compliance with the completion date is of the essence. Thirty (30) copies of the draft and final reports shall be provided. The final report shall be filed with the Court and shall become part of the Consent Decree and enforceable there under unless the parties to the decree agree to modify it.

IV. Periodic Evaluations

The consultant shall prepare quarterly reports which shall make an independent assessment of the City's efforts to comply with requirements of the final report and shall include, at a minimum: (a) an assessment of the City's compliance with requirements and

deadlines of the final report that were to have been implemented during that reporting period; (b) an assessment of the City's progress toward meeting the requirements that are to be implemented in the future; and (c) an evaluation of the reasons for any violations reported in the City's Discharge Monitoring Reports. The consultant's quarterly reports shall, to the extent possible, specifically assess the relative importance, within the context of the final plan as a whole, of the City's extent of compliance or noncompliance with each requirement or deadline that was to have been implemented or achieved during the reporting period. The consultant's quarterly reports shall also attempt to assess and evaluate the cause of any such delay or failure to achieve any requirement or deadline, and shall, whenever possible, evaluate the likely consequences and relative importance of any such delay or failure with respect to its effect on the City's ability to achieve and maintain long term compliance at the Southwest Plant. The consultant shall not, however, offer an opinion on the ultimate issue of the City's achievement or failure to achieve substantial compliance with the applicable quarterly requirements and deadlines of the final plan.

The independent consultant is not permitted to consider, in determining necessary actions or the schedule for implementing those actions in either the final report or the quarterly reports, any political, bureaucratic or financial limitations on the City, except those management, legal or cost/benefit considerations that are generally applicable in the management of large municipal wastewater treatment plants.

The quarterly evaluations shall be submitted to EPA, PaDER and the City of Philadelphia by the last day of the month following the completion of each calendar quarter. Reports shall be submitted until, under the terms of the Decree, the City has been in substantial compliance in each of the three areas addressed in the consultant's report for four out of five quarters.

ATTACHMENT I

City of Philadelphia
Southwest Plant

The following is a list of unit processes and subsystems that will be addressed during the evaluation of the performance of the Southwest Plant:

I) Sampling and metering equipment —

II) Grit removal/incineration system –

III) Scum disposal system

IV) Primary sedimentation tanks

- A) Scum removal system
- B) Sludge removal system
- C) Collector mechanism

V) Oxygen supply

VI) Aeration Tanks

VII) Final sedimentation tanks –

- A) Scum removal system
- B) Return sludge pumping system
- C) Collector mechanism

VIII) Chlorination facilities

- A) Chlorinators
- B) Flash mixers

IX) Sludge thickeners

X) Sludge digesters (North and South Banks)

- A) Mixing system
- B) Heating system
- C) Digested sludge pumps
- D) Overflow and transfer lines

XI) Sludge Dewatering

A) City owned facilities

B) Contract dewatering operations

ATTACHMENT II

Information to be Contained in Proposal

1. Statement of problem - state in succinct terms your understanding of the problem presented in the scope of work. Include a narrative description of the proposed effort and of the product to be delivered.
2. Work Plan - describe in narrative form, your plan for accomplishing the work. Inlcude a project organization and time for each event.
3. Prior Experience - the consultant must include in the proposal the following information:
   a. prior experience in design of wastewater plants. Sufficient descriptions must be provided to understand the facility size and treatment complexity of the referenced designs.
   b. prior experience in the actual operation and maintenance of wastewater plants. Experience solely in development of operational and maintenance manuals shall not be included under this item. Sufficient descriptions must be provided to understand facility size and treatment complexity of the referenced facilities, as well as the precise role in which the consultant acted with respect to the development and implementation of the facility's operation and maintenance program and the duration for which the consultant provided these services.
   c. for the independent consultant and any sub-consultant with more than 10% participation in the contract, a description of the independent consultant's prior dealings with the City of Philadelphia, the Environmental Protection Agency and the Commonwealth of Pennsylvania, listing contracts, dates and general descriptions of work performed.
4. Team Experience - proposals shall include names, qualifications, areas

of expertise and prior experience of all consultant and sub-consultant firms with more than 10% participation in the contract including the project coordinator.

5. Antidiscrimination - The City continues to support the fostering of an environment in which all businesses are free to flourish without the impediments of discrimination and strongly encourages all contractors/ vendors to offer opportunities to minority, female and disabled owned businesses to participate in all City contracts on an equitable basis with other firms.

6. Pricing for Work - the fee proposal should include:

   a. for each item of work listed in the scope of work, the following information must be stated;

      1. the number of hours for each task.

      2. the level of personnel performing these tasks.

      3. the hourly rate of the personnel.

   b. the overhead rates charged on the direct salary of personnel should be shared.

   c. any expenses anticipated.

E. General Criteria for Selection

1. All proposals received by the time and date specified will be reviewed by an Evaluation Committee. The Evaluation Committee will base its review on the following items of major importance:

   a. Specialized experience and technical competence of the firm and the individuals proposed (including joint ventures, associations or professional sub-contracts) in connection with the type of services required and the complexity of the project.

   b. The familiarity of the individuals proposed for the project with the

types of problems applicable to the design and construction of wastewater treatment projects with specific emphasis on operating and maintaining a wastewater treatment plant particularly one utilizing oxygen activated sludge processes and complex sludge handling applications.

c. The understanding of the purpose and scope of the project and of the work to be performed.

2. In addition to the above items of major importance, the Evaluation Committee will also consider, but not be limited to, the following items:

a. The firm's capacity to perform the work (including any specialized services within the time limitations required, considering the firm's current and planned workload and the experience in operating a plant the size of the Southwest Plant.

b. The firm's familiarity with pertinent federal and state regulations dealing with the NPDES program and wastewater treatment systems.

c. The fee required by the proposer.

3. Special Criteria for Selection

a. Proposals from firms who have had contracts with the City of Philadelphia related to the Wastewater Treatment Expansion Program will not be considered.

b. Depending upon the responses received to this request, the selected firm or key individual(s) working on the project, may be required to agree that it or they will not perform any work, as a prime or subcontractor for up to two years after the termination of its service under this consent decree for:

1. The Philadelphia Water Department, or

2. The Pennsylvania Department of Environmental Resources, Bureau of Water Quality, or

3. The United States Environmental Protection Agency, Water Management Division, Region III.

Within ten (10) days of the date on which this Request for Proposal was transmitted, please provide brief written comments as provided below on how this possible prohibition might affect your willingness to propose to this request. Response to these comments will be transmitted to all recipients of the Request for Proposal within ten (10) days of our receipt of the comments.

c. Submission date - all proposals must be received by at 5:00 PM at the Projects Control Division of the Water Department, ARA Tower, 1101 Market Street, Philadelphia, PA 19107.

d. Pre-proposal submission meeting - a meeting will be held at the Southwest Water Pollution Control Plant, 8200 Enterprise Avenue, Philadelphia, PA 19153 at 10:00 a.m. to 12:00 p.m., on , 1990 within 25 days of submission of RFP to allow interested firms to review the type and format of historical data, design information, etc., which will be necessary to conduct the analysis required in this proposal. Attendance is not mandatory.

e. Comments and Questions - comments and/or questions should be directed to:

Bruce Aptowicz
City of Philadelphia
Water Department
ARA Tower, 4th Floor
1101 Market Street
Philadelphia, PA 19107
(215) 592-6215

APPENDIX L

Enforcement Response Plan

ENFORCEMENT RESPONSE PLAN

INTRODUCTION AND PURPOSE

The City of Philadelphia, as the owner and operator of three publicly owned treatment works, has the primary responsibility for enforcing all pretreatment requirements found in the Clean Water Act, the regulations enacted thereto, the City of Philadelphia's Wastewater Control Regulations and the City's wastewater discharge permits. (Hereinafter, all requirements and obligations found in these documents shall be referred to as "pretreatment requirements"). The purpose of this Enforcement Response Plan is to ensure that the City's responsibility is carried out in a consistent, systematic, and timely fashion.

The goals of this Enforcement Response Plan are as follows:

1. to identify all instances of non-compliance with the pretreatment requirements; and

2. to ensure that the industrial user returns to compliance as quickly as possible and to ensure its continuing compliance thereafter; and

3. to penalize industrial users for their violations of the pretreatment requirements; and

4. to deter future violations of the pretreatment requirements; and

5. to recover any expenses incurred by the Water Department (hereinafter referred to as "PWD") attributable to an industrial user's non-compliance.

This Enforcement Response Plan consists of six sections:

TABLE OF CONTENTS

5. SECTION V - AMENDMENTS TO ENFORCEMENT RESPONSE PLAN

6. SECTION VI - SUMMARY OF ENFORCEMENT RESPONSE PLAN OBLIGATIONS OF WATER DEPARTMENT PERSONNEL

SECTION I - IDENTIFYING NON-COMPLIANCE

The permit administrators (PA), along with the manager of the Industrial Waste Unit (Manager) or his designee, have the responsibility of determining non-compliance with all pretreatment requirements. The permit administrators will determine if violations of any pretreatment requirements have occurred by taking the following action:

A. Review of Baseline Monitoring Reports (BMR), 90 Day Compliance Reports (90DCR), Periodic Compliance Reports (PCR), Spill or Slug Discharge Reports (oral and written), Responses to NOV's, Compliance Schedule Reports, and other Reporting Obligations as Contained in the SIU's Permit

The permit administrator will determine when all reports are due. Failure to make timely reports should be discovered within 10 days after the report's due date and the appropriate enforcement response discussed in Section II. should be initiated.

All reports should be reviewed within 30 days upon receipt to determine if they are complete and whether they indicate any violation of the pretreatment requirements.

B. Independent Sampling Verification

The permit administrators will independently sample all significant industrial users (SIU) at least once per reporting period. The permit administrators may sample an SIU as many times per year as the Permit Administrator deems necessary in order to determine 1) the potential for pretreatment violations; 2) the frequency, duration, and magnitude

of the violations; 3) whether the SIU is taking remedial actions to correct his violations of the pretreatment requirements; 4) to ensure that the industrial user returns as quickly as possible to full compliance.

All samples shall be taken using standard chain of custody forms.

The Bureau of Laboratory Services will then analyze the sample for all parameters as designated by the permit administrator and transmit its laboratory analysis to the Industrial Waste Unit as follows: (1) for organics analysis: within 60 days upon receipt; (2) for inorganics and conventional pollutants: within 30 days upon receipt. Within 10 days thereafter, the laboratory's report will be reviewed by the permit administrator for discharge violations. All lab results must be reproduced as a file copy to be attached to the chain of custody forms which will be placed in the SIU's active file.

C. Inspections

All SIUs shall undergo a comprehensive inspection at least once per calendar year. The permit administrator may conduct as many inspections of an SIU as the permit administrator deems necessary to determine 1) the potential for pretreatment violations, 2) the frequency, duration, and magnitude of the violations, 3) whether the SIU is taking the corrective action as promised or as agreed to in his permit agreement or consent order, and 4) to ensure to the permit administrator's satisfaction that the industrial user is using its best efforts to return to compliance or prevent future non-compliance.

Comprehensive pretreatment inspection forms shall be completed for the annual inspection and may be utilized for each subsequent inspection occurring that year. All completed inspection forms shall be placed in the SIU's active file.

D. Screening Process for Identifying SIUs

The formalized screening process for identifying SIUs is carried out on a continuing basis by the engineering support group of the industrial waste unit and the manager or his designee. This process determines whether industries and/or other non-domestic dischargers should be considered SIUs. This is accomplished through the use of annually-generated industrial directories, water company sales records, sewer sales records or any other information which may become available.

Where information indicates that an IU could be classified as an SIU, then that industry shall undergo a comprehensive inspection prior to a final determination by the engineering support group. A copy of the comprehensive inspection shall be kept on file in the Industrial Waste Unit. From this information, a permit shall be drafted and publicly noticed. A final permit shall then be issued. Upon issuance the manager or his designee shall assign a permit administrator to monitor the permit.

E. Compliance Schedules

Certain industries will be operating under compliance schedules. These compliance schedules will establish milestone dates for actions to ensure compliance with pretreatment requirements (for example, hire an

expert, purchase equipment, have equipment on line, etc.). The compliance schedule will also require the industry to notify the permit administrator at each step as to whether the action has been completed. Compliance schedules may be contained in compliance agreements, administrative orders, consent decrees or the permit.

The permit administrator must carefully monitor these compliance schedules to determine if the action has been completed on a timely basis and whether the proper notifications have been submitted. Violation of any compliance schedule deadline or notification requirement should be identified within 15 days after the milestone or reporting date has passed and the appropriate enforcement response discussed in Section II. should be initiated.

F. Records

The permit administrator shall maintain all supporting documentation regarding all pretreatment requirement violations and enforcement activities in the SIU's active file for three years. After three years the records shall be placed in storage.

SECTION II - ENFORCEMENT RESPONSES

A. Enforcement Response Options and Selection

All violations of the pretreatment requirements are instances of non-compliance and will receive a specific enforcement response. Pretreatment requirements are a matter of strict liability. Hence, good faith or lack of negligence on the industrial user's part is no defense to a violation of the pretreatment requirements.

The enforcement responses will range from notices of violation to formal civil litigation and/or termination of service, depending on the severity of the violation. A list of the enforcement responses, along with the personnel who will be implementing these responses, are described in Section II. E.

While similar violations will receive similar enforcement responses, as outlined in Section II. F, there is some inherent discretion within each enforcement response selection. For example, some violations will trigger either administrative action, formal civil litigation or permit revocation. The selection of the specific enforcement response option shall be at the PWD's sole discretion.

B. Significant Non-Compliance (SNC)

Definition of SNC:

While the definition of SNC is similar to the definition contained in 40 CFR Section 403.8(f)(2)(vii), it is in many ways stricter and therefore an IU may more easily find himself in SNC. SNC is defined as any of the following circumstances:

1. Chronic violations

   If 33% or more of all samples taken for any single parameter during any six month reporting period demonstrate exceedances, by any amount, of the daily maximum effluent limitation or the monthly average limitation.

2. Technical Review criteria violations

   Since the City's definition of chronic violations is twice as stringent as the federal definition, Technical Review

Criteria violations are encompassed in the definition of chronic violations.

3. Any violation of the pretreatment effluent limits that the PWD determines has caused, either alone or in combination with any other discharges, interference or pass through.

4. Any discharge of a pollutant that has caused imminent endangerment to human health, welfare or the environment or has resulted in the PWD's exercise of its emergency authority.

5. Violation by 45 days or more of the scheduled date of a compliance schedule milestone for starting construction, completing construction, attaining final compliance or any other milestone event described in the compliance schedule.

6. Failure to provide any required reports such as those listed in Section I.A, including reports on compliance with compliance schedule milestones, within 30 days of the due date.

7. Failure to report noncompliance accurately.

8. Any other violation or group of violations that (1) adversely affects the operation or implementation of the local pretreatment program or (2) either alone or in conjunction with any other discharge causes harm to the PWD.

C. Enforcement Response to SNC

Violations of the pretreatment requirements which constitute significant

noncompliance are considered to be the most serious violations and therefore require a strong and immediate enforcement response. The enforcement response to any instance of significant noncompliance will be as follows:

1. All instances of significant noncompliance will be immediately called to the attention of the manager or his designee.

2. If the SNC is such that imminent harm occurs to the PWD, its employees or the environment, the manager and, if required, the pretreatment attorney will take immediate steps to cease the violation. This action may be either an immediate permit revocation civil action with injunction or any other steps necessary to prevent the harm from continuing including the immediate termination of water or sewer service.

3. If the SNC is such that it will not cause imminent harm to the PWD, its employees or the environment, then the permit administrators will promptly send the offending IU a notice of violation (as attached in Exhibit B) informing him that he is in significant noncompliance and that formal civil litigation and/or administrative action (which may include the revocation of the IU's wastewater discharge permit or termination of service) will be commenced if the matter cannot be resolved within 30 days from the date of that notice. The pretreatment attorney, at his discretion, should he decide to pursue civil litigation, may attach to this notice of violation a copy of a complaint in equity which will be filed if a resolution does not occur within 30 days. The filing of this complaint or the initia-

tion of administrative action may be delayed at the pretreatment attorney's discretion and only in the following situations: (1) additional information needs to be gathered by the PWD in order to frame the proper allegations and corrective measures asked for in the complaint or administrative order or; (2) where effluent violations result in SNC and the IU has agreed in writing to retain the services of a licensed, professional engineer specializing in wastewater pretreatment to design a pretreatment system. Additional time may be allowed for the engineer to prepare his report so that a compliance schedule can be formulated.

4. The pretreatment attorney, the manager or his designee and/or permit administrator shall be available to meet with the offending industrial user during this 30 day period following the Notice of SNC.

5. If an agreement is reached involving the implementation of a compliance schedule, that compliance schedule shall be attached to, and become part of, the IU's Wastewater Discharge Permit.

6. Fines for SNC are mandatory and will be calculated in accordance with Section III.

7. If the SNC results in the PWD being fined, damages to the PWD or additional treatment costs being incurred by the PWD, then the offending IU shall pay these costs to the PWD.

8. All IUs in SNC at any time during any reporting period will be published in the Philadelphia Inquirer. Publication occurs twice each year after each six month reporting period.

9. In addition to utilizing the actions contained in numbers 1-8 immediately above, nothing shall preclude the pretreatment attorney or the manager or his designee from taking additional actions to ensure an immediate return to compliance.

D. Enforcement Response Options

Abbreviation	Response
AO	Administrative Order
ATC	Additional Treatment Costs (Payment for all additional treatment costs incurred by the PWD as a result of an IU's non compliance with pretreatment requirements)
CL	Civil Litigation (which may include injunctive relief, if appropriate)
CR	Cost Recovery (Payment for all damages incurred by the PWD as a result of an IU's non compliance with pretreatment requirements)
CRIM	Referral for Criminal Prosecution
CS	Compliance Schedule
FD	Fine-Discretionary
FM	Fine Mandatory
FR	Fine Recovery (The reimbursement of any fines levied against the PWD by any other agency as a result of an IU's non compliance with pretreatment requirements)
M	Meeting With IU to Resolve Non-Compliance
NOV	Notice of Violation (Attached as Exhibit A)
NOV-S	Notice of Violation - Significant
R	Revocation of Wastewater Discharge Permit
SNC	Enforcement Response to Significant Non-Compliance (Section II.C)
T	Termination of Water and/or Sewer Service

E. Enforcent Response Personnel

Abbreviation	Personnel
ATT.	Pretreatment Attorney
M	Manager, Industrial Waste Unit or Designee
L	Laboratory Personnel
PA	Permit Administrators
PW	Permit Writer

F. Enforcement Responses

1. Effluent Limit Violation

	Nature of Violation	Enforcement Response	Personnel
a)	Infrequent, no harm to PWD or environment	NOV, FD	PA
b)	Recurring, no harm to PWD or environment	level 1: NOV, M, CS, FD level 2: AO, CL	PA M, ATT.
c)	Violation causes harm to PWD or environment	SNC	M, ATT.
d)	Chronic violations (see Section II. B.1)	SNC	M, ATT.
e)	Accidental or slug discharge, isolated no harm	level 1: NOV, FD, ATC level 2: AO, CL	PA M, ATT.
f)	Accidental or slug discharge, recurring no harm	level 1: NOV, M, CS, FD, ATC level 2: AO, CL	PA M, ATT.
g)	Accidental or slug discharge, harm to PWD	SNC	M, ATT.
h)	Interference or pass through	SNC	M, ATT.
i)	Any intentional violation without prior notice to and approval by the PWD	level 1: CRIM, FM, AO, CL, FR, CR, ATC level 2: R, T	M, ATT. M, ATT.

2. POTW Verification Sampling Violation

	Nature of Violation	Enforcement Response	Personnel
a)	Effluent limit violation for any parameter	NOV, FD	PA
b)	Resample, violations continue to be detected	level 1: NOV, M, CS, FM level 2: CL , AO	PA M, ATT.

3. Self Monitoring (Sampling) Violation

	Nature of Violation	Enforcement Response	Personnel
a)	Failure to monitor as frequently as required in permit, (1st violation)	NOV, FD	PA
b)	Recurring failure to monitor as required in permit after notification by PWD	level 1: NOV, M, FM level 2: AO, CL, R	PA M, ATT.
c)	Incomplete monitoring, monitoring fails to test for all permit parameters, 1st violation	NOV, FD	PA
d)	Incomplete monitoring, monitoring fails to test for all permit parameters, recurring violations	level 1: NOV, FM, M level 2: AO, CL, R	PA M, ATT.
e)	Failure to monitor in accordance with the procedures contained in the permit, 1st violation	NOV, FD	PA
f)	Failure to monitor in accordance with procedures contained in the permit, recurring	level 1: NOV, FM, M level 2: AO, CL, R	PA M, ATT.

4. Reporting Violations

	Nature of Violation	Enforcement Response	Personnel
a)	Report is between 5 and 30 days late, isolated event	NOV, FD	PA
b)	Report is between 5 and 30 days late, recurring events	NOV, M, FM	PA
c)	Report is over 30 days late	SNC	M, ATT.
d)	Report is improperly signed or certified (1st violation)	NOV, FD	PA
e)	Report is improperly signed or certified after notice by PWD	NOV, M, FM	PA
f)	Failure to give one hour telephone notice to report accidental discharge, (spill or slug load) no harm (1st violation)	NOV, FD	PA
g)	Failure to give one hour telephone notice to report accidental discharge, spill or slug load, no harm, recurring	level 1: NOV, M, FM, level 2: AO	PA M
h)	Failure to give one hour telephone notice to report accidental discharge, (spill or slug load) (results in harm)	SNC	M, ATT.
i)	Failure to submit written report within five days after accidental discharge (no harm) 1st violation	NOV, FD	PA

	Nature of Violation	Enforcement Response	Personnel
j)	Failure to submit written report within five days after accidental discharge, (recurring)	level 1: NOV, M, FM level 2: AO	PA M
k)	Failure to notify City within 24 hours of becoming aware of a sample which violates the industrial users effluent limits and to report the next sample that shows a return to compliance (1st violation)	NOV, FD	PA
l)	Failure to notify the City within 24 hours of becoming aware of a sample which violates the industrial users effluent limits and to report the next sample that shows a return to compliance (recurring)	level 1: NOV, M, FM level 2: AO, CL	PA M, ATT.
m)	Failure to report non-compliance accurately	SNC, CRIM	M, ATT.

5. Compliance Schedule Violations[1]

	Nature of Violation	Enforcement Response	Personnel
a)	Missed milestone date by less than 45 days	NOV, FD	PA
b)	Missed milestone date by 45 days or more[2]	SNC	M, ATT.
c)	Failure to give notice as required in the compliance schedule (initial violation)	NOV, FD	PA
d)	Failure to give notice as required in the compliance schedule, recurring	level 1: NOV, M, FM level 2: AO	PA M

1 Penalties for the violation of compliance schedule milestone dates may be contained in the compliance schedule itself, administrative order or consent decree. Where these penalty provisions exist, penalties for those violations will be levied in accordance with those terms and conditions. If no such provisions exist then the penalties will be levied in accordance with the above enforcement responses.

2 If an IU wishes to avoid being in SNC it must notify the PWD in writing prior to being 45 days late and must explain its reasons for the delay. If the City believes that the delay is caused by factors completely outside of the control of the industrial user then the City may extend the milestone deadline. Such extension would therefore prevent the IU from violating its milestone date and therefore the IU would not be in SNC. The City will not grant extensions unless the IU clearly establishes its entitlement in a timely manner.

6. Unauthorized Discharges (No Permit)

	Nature of Violation	Enforcement Response	Personnel
a)	IU unaware of requirement, no harm to PWD or environment	NOV, FD	PW
b)	IU unaware of requirement, harm to PWD or environment	SNC	M, ATT.
c)	Failure to apply for a permit continues after notice by the PWD	level 1: NOV, FM, level 2: CL, T	PW M, ATT.
d)	IU has failed to renew its wastewater discharge permit	level 1: NOV, FD level 2: CL, T	PW M, ATT.

7. Other Permit Violations

Nature of Violation	Enforcement Response	Personnel
a) Waste streams are diluted in lieu of treatment, unintentional	level 1: NOV, FD, CS level 2: AO, CL, R, FM	PA M, ATT.
b) Waste streams are diluted in lieu of treatment, intentional	NOV, FM, CL, CRIM	M, ATT.
c) Inadequate record keeping, initial	NOV, FD	PA
d) Inadequate record keeping, recurring, after notice by PWD	level 1: NOV, FM, M level 2: AO, R	PA M, ATT.
e) Failure to mitigate non-compliance initial	NOV, FD, ATC, CR	PA
f) Failure to mitigate non-compliance after notice by PWD	level 1: NOV, FM, M, ATC, CR level 2: AO, CL, R	PA M, ATT.
g) Failure to allow inspector to inspect premises or to provide records as requested	level 1: NOV, FM, M, level 2: AO, CL, R	PA or PW M, ATT.
h) Failure to notify PWD in advance of any substantial change in volume or character of pollutants including any change in its hazardous waste notification.	NOV, FD	PA

G. Time Frame for Responses

1. Initial Enforcement Response

a) Late Reports - Enforcement response should be initiated within 5 days after determination that report is late.

b) Report Review - After a report has been reviewed and any non-SNC violation determined, the appropriate response shall be initiated within 5 days.

c) All other non-SNC violations - Enforcement response of the pretreatment standards should be initiated within 5 days after discovery by PA of violation.

2. Escalating Enforcement Response (level 2)

The level 2 enforcement response should be initiated within 30 days after it appears that the level 1 response is ineffective in correcting the violation.

3. Significant Non Compliance

Enforcement responses should be initiated according to the time frames established in Section II.C.

H. Additional Responses

The enforcement responses contained in section II.F. are general guidelines and do not limit or restrict the PWD's ability to take

any other or more severe enforcement actions where the PWD in its sole discretion, deems it appropriate.

SECTION III. CALCULATION OF FINES

A. Section II. F., Enforcement Response, states those violations for which fines are mandatory or discretionary.

B. For those violations for which fines are discretionary, we will consider the following factors in determining whether fines should be assessed:

1. Reasons for non-compliance.
2. Compliance history - The PWD will examine the IU's history of compliance for the specific violation as well as for all other permit terms and conditions.
3. Good faith compliance efforts - Good faith compliance efforts consist of the following actions:
    a) whether the IU has responded to the NOV within 15 days
    b) the actions the IU has taken or will take to ensure a return to compliance
    c) the timeliness of these corrective actions

C. Where the violation of a pretreatment standard requires a fine, either where a fine is mandatory or the PWD has determined that a fine is appropriate pursuant to Section II. F. and III. B., the fine shall be $300 per violation per day. The $300 per violation per day fine is subject to increase to the maximum amount as allowed by law.

D. Calculation of maximum fines

The maximum amount of fines for pretreatment violations will be calculated as follows:

1. Fines for violations of the daily maximum effluent limit shall be $300 per day for each and every parameter violated.

2. Violations of the monthly average effluent for any parameter shall be considered as violations for each and every day within that month and therefore a $300 per day fine for all days in that month will be assessed.

3. For each day any report is late a $300 fine will be assessed.

4. If an IU fails to self monitor then a fine of $300 will be assessed for each parameter that the IU fails to monitor.

5. Accidental Spill. A $300 fine will be assessed for each of the following: 1) the accidental spill, 2) the failure to give us one hour notice, if appropriate, and 3) the failure to follow-up with a five day notice of the spill, if appropriate.

6. All other violations will be assessed a $300 penalty per day for each day that the violation continues.

E. Reduction of Maximum Fines

The calculations in Section III. D. 1. through 6. are the maximum fines which can be assessed against an IU for violating the pretreatment requirements.

The PWD has the discretion to reduce the maximum fine in accordance with the general guidelines listed immediately below and contained in this section. In determining whether a fine reduction is warranted, the PWD will consider the following factors ("factors"):

1. Reasons for violation
2. Magnitude of violation
3. Duration of violation
4. Effect of violation on receiving water or sludge
5. Effect of violation on PWD or its employees
6. Compliance history of industrial user
7. IU's response to violation. How quickly IU has responded to NOV and timeliness of its remedial actions

Where the PWD has determined that a reduction in the maximum fine is warranted, the PWD shall use the following general guidelines in reducing the fine:

1. First, the maximum fine shall always be calculated. The maximum fine is calculated in accordance with III. D. 1. through 6.

2. A "reduced fine amount" is next calculated. The reduced fine shall be the fine which the IU must immediately pay to the PWD once a compliance agreement or consent order is finalized. The reduced fine is calculated as follows:

   a. All daily effluent violations are totaled and multiplied by $300 per violation per day. No reduction occurs from this figure.

b. Each monthly average violation, which normally would be calcualated as 30 days of violations, may be treated as low as one day of violation if the PWD determines that such reduction is warranted given the factors previously outlined in this section.

c. Similarly, reporting violations are fined at $300 per day for each day late. However, they may be reduced to as low as one day of violation if the PWD determines that such reduction is warranted given the factors previously outlined in this section.

d. All violations of self monitoring are assessed at $300 per parameter not monitored. No reduction occurs from this figure.

e. The reduced fine will be the sum of a. through d.

f. In certain situations the reduced fine may be further reduced by up to 30% if all of the following conditions are met. (1) The PWD is convinced that the IU is using its very best efforts to immediately return to compliance and; (2) The PWD is convinced that the violation will not recur and; (3) The PWD determines that this additional reduction is warranted under the factors previously discussed in this section.

SECTION IV - COMPLIANCE SCHEDULES

A. Introduction

Many violations of the pretreatment requirements will require that a Compliance Schedule be entered into. This Compliance Schedule will have

as its major goal the establishment of milestone dates for the completion of certain specified events leading the IU to full compliance with all pretreatment requirements as quickly as possible.

B. Compliance Schedules

1. While compliance schedules may be appropriate in other instances of non-compliance, they will most often be used to correct effluent limit violations. While the precise milestone events may differ from case to case, as a general rule they should, at a minimum, contain the following events with a corresponding milestone completion date:

   a. Hire a licensed professional engineer specializing in wastewater pretreatment to evaluate the industrial user's processes and to develop a pretreatment system designed to bring the IU into full compliance with all pretreatment requirements.

   b. Licensed professional engineer must submit a detailed plan of the proposed pretreatment system to the City for its review. The plan must state in detail all steps necessary for the IU to achieve full compliance with all pretreatment requirements.

   c. Purchase all necessary pretreatment equipment. Along with the IU's standard compliance notification the IU must attach copies of the purchase orders for the equipment.

   d. Accept delivery of the pretreatment equipment.

   e. Install, debug and test the pretreatment equipment and have it on line and in operation.

f. Test period - maintain a 95% compliance rate for a period of 90 consecutive days as to all pretreatment requirements.

2. Within five working days after the completion date for each milestone event the IU must notify the PWD in writing as to whether the event has been completed. If the event was not completed the notice must state the reasons for the failure, the expected completion date of the event and the steps to be taken to avoid further delays. This notice does not excuse the IU for its failure to meet the milestone dates.

SECTION V - AMENDMENTS TO ENFORCEMENT RESPONSE PLAN

The Enforcement Response Guide may be amended at any time and for any reason at the sole discretion of the PWD.

SECTION VI - SUMMARY OF ENFORCEMENT RESPONSE PLAN OBLIGATIONS OF WATER DEPARTMENT PERSONNEL

This section briefly summarizes the obligations of water department personnel found in Sections I through V of the Enforcement Response Plan.

Obligation	Time Frame	Personnel
I. Reports		
A. determine timeliness of all reports	w/in 10 days of due dates	PA
B. review all reports	w/in 30 days of receipt	PA
C. initiate appropriate enforcement response for all non-SNC violations	a) w/in 5 days after timeliness determination has been made	PA
	b) w/in 5 days after report has been reviewed	PA

D. initiate level 2 enforcement if necessary	w/in 30 days after level 1 has failed	M, ATT.
E. initiate appropriate enforcement response for any SNC violation	immediately upon discovery of violation in accordance with Section II(c) of the Enforcement Response Plan	M, ATT.
II. Independent Sampling		
A. sample all SIU's	at least once per reporting period	PA
III. Analyze Samples		Lab
A. organics	w/in 60 days of receipt	
B. inorganics & conventional pollutants	w/in 30 days of receipt	Lab
C. review lab results	w/in 10 days of receipt from lab	PA
IV. Effluent Limits		
A. initiate appropriate enforcement response for any effluent limit violation	a) w/in 5 days of receipt of lab results b) if SNC, in accordance with Section II(c)	PA M, ATT.
B. initiate level 2 enforcement if necessary	w/in 30 days after level 1 enforcement has failed	M, ATT.
V. IU Self-Monitoring		
A. initiate appropriate enforcement response for any self-monitoring violation	w/in 5 days of discovery of violation	PA
B. initiate level 2 enforcement if necessary	w/in 30 days after level 1 has failed	M, ATT.

VI.	Inspections		
	A. thoroughly inspect all SIU's	at least once per calendar year	PA
	B. initiate enforcement response	w/in 5 days after discovery of violation through inspection	PA
VII.	Compliance Schedules		
	A. initiate appropriate enforcement response for any missed milestone dates	w/in 15 days of any missed milestone date	PA
	B. initiate SNC enforcement if necessary for continuing missed milestone dates	45 days after any missed milestone date	M, ATT.
VIII.	All Other Permit Violations		
	A. initiate appropriate enforcement response	a) w/in 5 days of discovery of violation	PA, M
		b) If SNC, in accordance with Section II(c)	M, ATT.
	B. initiate level 2 enforcement if necessary	w/in 30 days after level 1 enforcement has failed	M, ATT.

CITY OF PHILADELPHIA

Industrial User Name
Address
_____
_____

DATE

NOTICE OF VIOLATION

Dear _____:

THIS LETTER SERVES AS FORMAL NOTICE THAT YOU ARE IN VIOLATION OF THE TERMS AND CONDITIONS OF YOUR WASTEWATER DISCHARGE PERMIT. THE SPECIFIC VIOLATIONS ARE DESCRIBED ON PAGE TWO OF THIS NOTICE.

THEREFORE YOU MUST TAKE THE FOLLOWING ACTION:

Pursuant to Part V(A) of your Wastewater Discharge Permit your written response report to this notice of violation is due within 15 days from receipt of this notice. Your response report must state the reasons for your violation, all actions that you have taken to return to compliance and when full compliance will be achieved.

Failure to submit your written response report within 15 days will result in further enforcement action and will subject you to fines for your noncompliance.

This notice does not waive, either expressly or by implication, the power of the City of Philadelphia to impose penalties for any and all violations of permit conditions prior to or after the issuance of this notice of the conditions upon which this notice is based. This notice shall not be construed so as to waive or impair any rights of the City of Philadelphia, heretofore or hereafter existing.

Please contact me at _____ if you have any questions regarding your violations or your obligations to provide a written response report.

Sincerely,

_____
PERMIT ADMINISTRATOR

EXHIBIT A

CITY OF PHILADELPHIA

JOHN F. [illegible]SKI

Industrial User Name
Address
_____
_____

DATE

NOTICE OF SIGNIFICANT NON COMPLIANCE

Dear :

THIS LETTER SERVES AS FORMAL NOTICE THAT YOU ARE IN SIGNIFICANT NON COMPLIANCE WITH THE TERMS AND CONDITIONS OF YOUR WASTEWATER DISCHARGE PERMIT. THE SPECIFIC VIOLATIONS ARE DESCRIBED ON PAGE TWO OF THIS NOTICE.

THEREFORE YOU MUST TAKE THE FOLLOWING ACTIONS:

(1) Pursuant to Part V(A) of your Wastewater Discharge Permit, you must file your written response report to this Notice within 15 days. Your response report must state the reasons for your violation, all actions you have taken to return to compliance and state when a return to full compliance will be achieved.

(2) If the significant non compliance cannot be fully resolved within 30 days you must enter into an agreement with the City within 30 days from this Notice, setting forth the terms and conditions for your return to full compliance. If an agreement cannot be reached within 30 days, legal and/or administrative action will be commenced.

Fines are mandatory for all instances of Significant Non Compliance. The longer you delay in returning to compliance the greater these fines will become.

Call me immediately upon receipt of this letter if you wish to avoid further enforcement action and greater fines.

Sincerely,

THOMAS HEALEY
Manager, Industrial Waste Unit

EXHIBIT B

CITY OF PHILADELPHIA

IN RE:

DATE:

DESCRIPTION OF VIOLATIONS

YOU ARE IN VIOLATION OF THE FOLLOWING TERMS AND CONDITIONS OF YOUR WASTEWATER DISCHARGE PERMIT:

I. ☐ EFFLUENT VIOLATION

DATE	PARAMETER	VALUE	UOM	ONE DAY MAX.

II. ☐ ACCIDENTAL OR SLUG DISCHARGE

COMMENTS:

III. ☐ INTERFERENCE OR PASS THROUGH

COMMENTS:

IV. ☐ REPORTING VIOLATIONS

COMMENTS:

V. ☐ COMPLIANCE SCHEDULE VIOLATIONS

COMMENTS:

VI. ☐ OTHER VIOLATIONS

COMMENTS:

APPENDIX M

Center City Project Inventory - 1992

PHILADELPHIA CITY PLANNING COMMISSION

Center City Project Inventory
Proposed Projects

Address	900 Block Chestnut Street
Owner	PMA, Jefferson, Zuritsky (check) & I Goldberg
Proposed Use	Office and retail
Zoning	C-5
Developer Interest	As above
Potential City Participation	
Potential Planning Commission Action	
Remarks	Demolition as of 12/91, except Goldberg's.

1000 Market Street

Address	1000 Block Market Street
Owner	Various owners
Proposed Use	
Zoning	C-5
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	Development is more potential than proposed

1201 Filbert Street

Address	1201 Filbert Street
Owner	Parkway (Joseph Zuritsky)
Proposed Use	
Zoning	C-5
Developer Interest	Zuritsky
Potential City Participation	
Potential Planning Commission Action	
Remarks	Project to be done in two phases: 1)garage; 2) hotel

1301 Market Street

Address	1301 Market Street
Owner	Rappaport
Proposed Use	
Zoning	C-5
Developer Interest	Zuritsky
Potential City Participation	
Potential Planning Commission Action	
Remarks	

1401 Chestnut Street

Address	1401 Chestnut Street
Owner	Mellon Bank, et al
Proposed Use	Office, commercial
Zoning	C-5
Developer Interest	Berwyn Reality
Potential City Participation	
Potential Planning Commission Action	
Remarks	

1508-12 Walnut Street

Address	1508-12 Walnut Street
Owner	Ralph Heller
Proposed Use	Office, commercial
Zoning	C-5
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	

1600 Vine Street

Address	1600 Vine Street
Owner	Franklin Town Corporation
Proposed Use	Office
Zoning	C-5
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	Present landscaped area

1601 Vine Street

Address	1601 Vine Street
Owner	Franklin Town Corporation
Proposed Use	Mixed use
Zoning	C-5
Developer Interest	
Potential City Participation	Franklin Town Urban Renewal Area
Potential Planning Commission Action	
Remarks	Recent rezoning from C-4

1701 Market Street

Address	1701 Market Street
Owner	Richard I. Rubin
Proposed Use	
Zoning	C-5
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	

1701 Vine Street

Address	1701 Vine Street
Owner	Klein Realty
Proposed Use	Mixed use - hotel/apartment/office
Zoning	C-5
Developer Interest	
Potential City Participation	Franklin Town Urban Renewal Area
Potential Planning Commission Action	
Remarks	Recent zoning change from C-4

1800 Arch Street

Address	1800 Arch Street
Owner	Bell Atlantic
Proposed Use	Office, commercial
Zoning	C-4
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	Recent zoning change from C-4

1919 Market Street

Address	1919 Market Street
Owner	Linpro
Proposed Use	Office
Zoning	C-5
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	W3MH architects Dallas, 2nd phase

2000 Arch Street

Address	SW corner of 20th and Arch Streets
Owner	
Proposed Use	
Zoning	C-4
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	

2101 Market Street

Address	2101 Market Street
Owner	Maguire Thomas
Proposed Use	Office, commercial
Zoning	C-5
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	

2201 Market Street

Address	2201 Market Street
Owner	PECO
Proposed Use	1
Zoning	C-5
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	

2301 Race Street

Address	N.W. Corner 23rd and Race
Owner	Philly Associates & Co. L.P. & CSX Transportation, Inc.
Proposed Use	Residential
Zoning	RC-4
Developer Interest	A number of residential plans have been presented for discussion
Potential City Participation	
Potential Planning Commission Action	
Remarks	

ACME Street

Address	1501 Arch Street
Owner	Acme
Proposed Use	
Zoning	C-5
Developer Interest	Park Tower
Potential City Participation	
Potential Planning Commission Action	
Remarks	Development proposal withdrawn

Afro-American Museum

Address	701 Arch Street
Owner	Afro-American Museum
Proposed Use	Museum expansion and office development
Zoning	L-4
Developer Interest	Afro-American Museum
Potential City Participation	
Potential Planning Commission Action	Zoning change support to C-4
Remarks	

City Hall Annex

Address	13th and Filbert Streets
Owner	Kusmersky
Proposed Use	Office rehab
Zoning	C-5
Developer Interest	Kusmersky
Potential City Participation	
Potential Planning Commission Action	
Remarks	

Corestates Headquarters

Address	800 Market Street
Owner	JMB/Urban Investors/Corestates
Proposed Use	Mixed use office and retail in two towers
Zoning	C-5
Developer Interest	As above
Potential City Participation	Close Ranstead Street
Potential Planning Commission Action	Support
Remarks	

Federal Detention Center

Address	700 Arch Street
Owner	LJK Incorporated
Proposed Use	Federal Prison
Zoning	C-5
Developer Interest	U.S. Government
Potential City Participation	
Potential Planning Commission Action	
Remarks	700 Beds

Forrest City Dillon

Address	NE corner Franklin Town Blvd. and Callowhill Street
Owner	Forest City Dillon
Proposed Use	+/- 300 apartment units
Zoning	RC-4
Developer Interest	Forest City Dillon
Potential City Participation	Franklin Town Urban Renewal Area
Potential Planning Commission Action	
Remarks	Phase Two/One East Franklin Town Blvd.

Address	21st and Hamilton Streets
Owner	Pacetti
Proposed Use	Apartment/Hotel
Zoning	R-14
Developer Interest	Pacetti, not pursuing project
Potential City Participation	
Potential Planning Commission Action	Has supported development in the past
Remarks	Overbuild of R.R. tracks behind Rodin Museum

Address	1900 Hamilton Street
Owner	Redevelopment Authority
Proposed Use	Elderly apartment - +/- 300 units
Zoning	RC-4
Developer Interest	Forest City Dillon
Potential City Participation	Franklin Town Urban Renewal area
Potential Planning Commission Action	
Remarks	

Franklin Town Site

Address	NW corner Franklin Town Blvd. and Callowhill Street
Owner	Franklin Town Corporation
Proposed Use	Retail
Zoning	RC-4
Developer Interest	
Potential City Participation	Franklin Town Urban Renewal Area
Potential Planning Commission Action	Requested by Franklin Town to rezone to C-4.
Remarks	

Free Library Site

Address	1901 Callowhill Street
Owner	Free Library, et al
Proposed Use	Combined library expansion and private office
Zoning	C-15
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	Rezoning and request by PIDC to reconsider Parkway controls
Remarks	

Gallery I Air Rights

Address	9th and Market Streets
Owner	Redevelopment Authority
Proposed Use	Hotel
Zoning	C-5
Developer Interest	None as of 12/91
Potential City Participation	
Potential Planning Commission Action	
Remarks	

Gallery II Air Rights

Address	1001 Market Street
Owner	Redevelopment Authority
Proposed Use	Twin office towers
Zoning	C-5
Developer Interest	
Potential City Participation	Gallery Urban Renewal Project
Potential Planning Commission Action	
Remarks	No developer as of 12/91

Girard Estate

Address	1100 Market Street
Owner	Philadelphia Board of City Trusts
Proposed Use	Mixed use office/retail
Zoning	C-5
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	

GSA Office Campus

Address	30th Street and Walnut Street
Owner	Post Office
Proposed Use	Regional headquarters of G.S.A. office complex
Zoning	Industrial Development
Developer Interest	General Services Administration Linpro
Potential City Participation	
Potential Planning Commission Action	
Remarks	

Justice Center

Address	1300 Arch Street
Owner	City of Philadelphia
Proposed Use	Court facility
Zoning	C-5
Developer Interest	City of Philadelphia
Potential City Participation	
Potential Planning Commission Action	
Remarks	

Meridian Tower

Address	Penn Center Square
Owner	
Proposed Use	Office, commercial
Zoning	C-5
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	

Museum Towers II

Address	1800 Spring Garden
Owner	Adwin Realty and Hertzfeld
Proposed Use	Mixed used apartment and supermarket/retail
Zoning	RC-4
Developer Interest	Adwin Realty and Hertzfeld
Potential City Participation	Franklin Town Urban Renewal area
Potential Planning Commission Action	
Remarks	Phase Two

Penn Center West

Address	North side JFK - from 20th Street to Schuylkill River
Owner	Penn Center West Associated (Leonard Fruchter)
Proposed Use	Mixed use, office and retail
Zoning	C-5
Developer Interest	Leonard Fruchter
Potential City Participation	
Potential Planning Commission Action	
Remarks	Part of Atlantic Center proposal which includes development at 30th Street Station

Philadelphia Orchestra Hall

Address	Broad and Spruce Streets
Owner	Philadelphia Orchestra
Proposed Use	Orchestra Hall performance center
Zoning	C-5
Developer Interest	As above
Potential City Participation	
Potential Planning Commission Action	
Remarks	Proposal stalled pending further funding, Avenue of the Arts

PMA Site

Address	SE corner 10th and Market Streets
Owner	Pennsylvania Manufacturers' Association
Proposed Use	Potential office/retail
Zoning	C-5
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	

Police Operation Building Site

Address	SW corner 7th and Cherry Streets
Owner	Redevelopment Authority
Proposed Use	
Zoning	C-4
Developer Interest	City of Philadelphia
Potential City Participation	
Potential Planning Commission Action	
Remarks	

Address	NE corner 9th and Arch Streets
Owner	Redevelopment Authority
Proposed Use	Asian trade center - office/retail
Zoning	C-4
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	

Police Station Site

Address	2001 Pennsylvania Avenue
Owner	City of Philadelphia
Proposed Use	Relocation of station to allow for expanded private development
Zoning	R-15
Developer Interest	
Potential City Participation	As above and closing Pennsylvania Avenue
Potential Planning Commission Action	
Remarks	This action would be coordinated with private development on Youth Study Center site

Address	NE corner 9th and Vine Streets
Owner	City of Philadelphia, et al
Proposed Use	
Zoning	L-4
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	In the now expired (8.90) Franklin Square Renewal Area. North of the new Vine St. R.O.W.

Address	NE corner 8th and Vine Streets
Owner	PennDOT
Proposed Use	
Zoning	L-4
Developer Interest	
Potential City Participation	
Potential Planning Commission Action	
Remarks	In the area taken for Vine Street Expressway

Walnut Towers

Address	800 Walnut Street
Owner	Parkway Corporation
Proposed Use	27,000 square feet of retail and 550 apartment units in two towers
Zoning	C-4
Developer Interest	Parkway Corporation/Joe Zuritsky
Potential City Participation	Washington Square West Urban Renewal Area
Potential Planning Commission Action	
Remarks	Phase II of an existing garage and retail spaces

Wilma Theatre

Address	Broad and Spruce Streets
Owner	Labro (Norman Wolgin)
Proposed Use	Theater/parking/hotel expansion
Zoning	C-5
Developer Interest	As above
Potential City Participation	
Potential Planning Commission Action	
Remarks	To include "Wilma Theatre"

Youth Study Center Site

Address	2000 Pennsylvania Avenue
Owner	Fairmount Park and City of Philadelphia
Proposed Use	Residential/Hotel
Zoning	R-15
Developer Interest	
Potential City Participation	Relocation of Y.S.C. and street closings
Potential Planning Commission Action	
Remarks	To be coordinated with relocation of police station - 2001 Pennsylvania Avenue

Abbott's Square Phase II

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

New Market

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

Penn's Landing

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

Pier's 9 and 11 North

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

Jayne Estate

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

Eunice Lazin

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

Philadelphia Trade Center

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

Pier 24 North

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

Pier 25 North

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

Parking Authority Impoundment Lot

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

Spring Garden Incinerator

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

Chinatown Hotel Expansion

Address

Owner

Proposed Use

Zoning

Developer Interest

Potential City Participation

Potential Planning Commission Action

Remarks

Spectrum II

Address	3601 S. Broad Street
Owner	Spectacor New Arena Partnership
Proposed Use	Sports/Entertainment
Zoning	Sports District
Developer Interest	Owner
Potential City Participation	None
Potential Planning Commission Action	Support
Remarks	Lease signed by City Council 7/3/91

APPENDIX I

Financial Statements of the Water Fund for Fiscal Years Ended June 30, 1990 and 1989

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CITY OF PHILADELPHIA- WATER DEPARTMENT

Administrating the Water Fund

TABLE OF CONTENTS

CITY OF PHILADELPHIA- WATER DEPARTMENT

BALANCE SHEETS, JUNE 30, 1990 AND 1989

	1990	1989
ASSETS		
Current Assets:		
Cash on Deposit and on Hand	$30,000	
Equity in Pooled Cash and Investments	4,400,975	$51,953,109
Due from Other Funds		
Accounts Receivable:		
Utility Charges	103,502,350	94,013,381
Other	24,188,894	21,830,729
Allowance for Doubtful Accounts	(55,909,510)	(12,152,358)
Materials and Supplies Inventory	5,800,230	5,972,792
Other Current Assets		
Total Current Assets	82,012,939	161,617,653
Restricted Assets:		
Cash on Deposit for Capital Purposes	30,090,379	2,295
Investments	7,833,813	31,886,000
Equity in Consolidated Cash Account for Capital Purposes	21,663,706	91,342,792
Sinking Funds and Reserves Held by Fiscal Agents	134,466,044	139,180,848
Sinking Funds Applicable to General Obligation Bonds	291,046	275,217
Grants from Other Governments for Capital Purposes	18,617,068	19,404,745
Accrued Interest Receivable	280,078	108,747
Total Restricted Assets	213,242,134	282,200,644
Plant, Property and Equipment:		
In Service	2,083,363,035	1,949,845,119
Less: Accumulated Depreciation	(701,192,262)	(653,182,460)
Under Construction	64,847,253	131,354,783
Total Property, Plant and Equipment	1,447,018,026	1,428,017,442
Total Assets	$1,742,273,099	$1,871,835,739

CITY OF PHILADELPHIA- WATER DEPARTMENT

BALANCE SHEETS, JUNE 30, 1990 AND 1989

	1990	1989
LIABILITIES AND FUND EQUITY		
Current Liabilities:		
Vouchers Payable	$3,815,872	$6,235,029
Accounts Payable	7,216,238	8,732,369
Salaries and Wages Payable	2,807,168	2,576,207
Construction Contracts Payable	11,899,948	11,725,408
Due to Other Funds	49,531	54,392
Accrued Expenses	27,452,291	26,070,846
Deferred Revenue	5,096,892	
Funds Held in Escrow	249,763	1,583,469
Current Maturities of Long-Term Bonded Debt	51,218,119	47,827,999
Total Current Liabilities	109,805,822	104,805,719
Long-Term Liabilities:		
Bond Anticipation Notes	96,200,000	103,100,000
General Obligation Bonds	41,112,414	50,370,533
Revenue Bonds - Principal Amount	1,052,505,000	1,087,565,000
Less Unamortized Discount	(130,934,660)	(140,365,546)
Other Long-Term Liabilities	40,026,438	33,701,405
Total Long-Term Liabilities	1,098,909,192	1,134,371,392
Total Liabilities	1,208,715,014	1,239,177,111
Fund Equity:		
Contributed Capital - Local Sources	24,642,120	24,642,120
Contributed Capital - Other Sources	537,246,513	549,703,789
Retained Earnings:		
Reserved for Capital Purposes	14,503,947	34,366,064
Unreserved	(42,834,495)	23,946,655
Total Fund Equity	533,558,085	632,658,628
Total Liabilities and Fund Equity	$1,742,273,099	$1,871,835,739

CITY OF PHILADELPHIA- WATER DEPARTMENT

STATEMENT OF REVENUES, EXPENDITURES, ENCUMBRANCES AND CHANGES IN FUND BALANCE - BUDGET AND ACTUAL FOR THE FISCAL YEARS ENDED JUNE 30, 1990 AND 1989 (LEGALLY ENACTED BASIS)

	1990		1989	
	BUDGET	ACTUAL	BUDGET	ACTUAL
REVENUE:				
Locally Generated Non-Tax Revenue	$242,417,000	$247,265,413	$249,132,000	$243,783,027
Revenue from Other Governments	5,992,000	4,502,326	17,020,000	16,098,184
Revenue from Other Funds	13,540,000	31,165,214	12,740,000	13,286,381
Total Revenue	261,949,000	282,932,953	278,892,000	273,167,592
EXPENDITURES AND ENCUMBRANCES:				
Personal Services	71,230,314	66,775,691	71,500,669	68,426,588
Purchase of Services	57,179,913	55,802,276	54,699,597	53,222,003
Materials and Supplies	22,758,979	21,361,059	20,892,651	19,876,819
Equipment	3,740,400	2,417,599	2,475,521	1,566,052
Contributions, Indemnities and Taxes:				
Pension Contributions	11,040,000	11,033,901	9,179,697	9,154,888
Other Employee Benefits	19,117,000	17,626,723	16,950,931	17,172,685
Indemnities and Taxes	4,516,500	2,854,690	4,857,000	4,890,673
Sub-total	34,673,500	31,515,314	30,987,628	31,218,246
Debt Service - Principal	47,827,999	47,827,999	45,965,000	44,864,919
Debt Service - Interest	71,525,396	65,353,246	70,549,005	67,382,607
Interfund Service Charges	16,043,499	21,636,663	14,364,929	22,312,190
Advances,Subsidies, Miscellaneous	1,000,000			
Total Expenditures and Encumbrances	325,980,000	312,689,848	311,435,000	308,869,424
OPERATING SURPLUS (DEFICIT)- FOR THE YEAR	($64,031,000)	(29,756,895)	($32,543,000)	(35,701,833)
FUND BALANCE, July 1		20,968,441		48,078,255
ADJUSTMENTS:				
Commitments Cancelled - Net		7,323,492		7,472,504
Revenue Adjustments		(489,330)		(336,761)
Other Adjustments		1,954,292		1,456,276
Adjusted Fund Balance, July 1		29,756,895		56,670,274
FUND BALANCE, June 30		$0		$20,968,441

CITY OF PHILADELPHIA-WATER DEPARTMENT

BONDED DEBT
FOR THE FISCAL YEAR ENDED JUNE 30, 1990

	Authorization					Fiscal Year 1991		
						Debt		
				Interest	Outstanding	Service	Principal	Outstanding
Series	Date	Amount	Maturities	Rates	June 30,1990	Interest	Requirements	June 30, 1991
Revenue Bonds:								
First Series	5/1/74	$75,000,000	4/1980 to 4/2009	5.55 to 7.00	$59,375,000	$4,093,788	$1,675,000	57,700,000
Second Series	(Refunded)							
Third Series	9/1/76	75,000,000	10/1979 to 10/2001	5.00 to 7.625	53,090,000	3,865,115	2,875,000	50,215,000
Fourth Series	10/1/77	75,000,000	10/1980 to 10/2002	4.75 to 6.75	54,475,000	3,559,000	2,775,000	51,700,000
Fifth Series	12/1/78	100,000,000	12/1981 to 12/2008	5.80 to 7.70	85,130,000	6,307,025	2,220,000	82,910,000
Sixth Series	(Refunded)							
Seventh Series	(Refunded)							
Eighth Series	(Refunded)							
Ninth Series	4/1/83(Prtl Ref)	161,955,000	4/1983 to 10/2006	4.75 to 9.875	35,635,000	3,052,337	3,910,000	31,725,000
Eleventh Series	12/1/85	286,900,000	10/1986 to 12/2004	6.00 to 9.10	244,460,000	13,940,290	14,525,000	229,935,000
Twelfth Series	7/1/86	184,975,000	7/1989 to 7/2016	5.70 to 7.90	182,730,000	12,961,442	2,370,000	180,360,000
Thirteenth Series	8/19/86	44,300,000	4/1988 to 4/2000	variable	38,400,000	2,300,000	3,000,000	35,400,000
Fourteenth Series	5/15/89	158,265,000	10/1990 to 10/2008	6.50 to 7.00	158,265,000	6,653,670	1,710,000	156,555,000
Fifteenth Series	5/15/89	176,005,000	10/1992 to 10/2004	6.60 to 6.95	176,005,000	6,760,365		176,005,000
Total		1,337,400,000			1,087,565,000	63,493,032	35,060,000	1,052,505,000
Bond Anticipation Notes		124,000,000			103,100,000	5,100,000	6,900,000	96,200,000
General Obligation Bonds		219,793,841			50,370,533	2,182,873	9,258,119	41,112,414
Total		$1,681,193,841			$1,241,035,533	$70,775,905	$51,218,119	$1,189,817,414

ANNUAL DEBT SERVICE REQUIREMENT:

Fiscal Year	Interest	Principal	Total
1991	70,775,905	51,218,119	121,994,024
1992	69,147,471	52,784,919	121,932,390
1993	67,251,405	58,629,919	125,881,324
1994	65,089,410	61,108,919	126,198,329
1995	62,812,043	63,168,919	125,980,962

The amount of Capitalized Interest added to Construction in Progress in Fiscal 1990 was $7,113. Interest Expense was reduced by the same amount.

Bond Anticipation Notes are classified on the Balance Sheet as Long-Term Liabilities. The notes were issued for the purpose of funding capital assets and in anticipation of being refunded by Long Term Revenue Bonds

The debt service interest costs for fiscal years 1991 to 1995 for Bond Anticipation Notes are estimated. There are notes which may have variable interest rates and as a result, the actual interest costs may be affected by note market conditions.

CITY OF PHILADELPHIA-WATER DEPARTMENT

SUPPLEMENTAL SCHEDULE OF RATE COVENANT COMPLIANCE FOR FISCAL YEAR ENDED JUNE 30, 1990 (Legally Enacted Basis)

LINE NO.		
1.	Total Operating Revenue	$271,221,830
2.	Net Operating Expense	(146,392,761)
3.	Bond Anticipation Notes	(11,168,000)
4.	Net Operating Revenue After Notes	113,661,069
	DEBT SERVICE	
5.	Revenue Bonds Outstanding	(88,976,986)
6.	General Obligation Bonds Outstanding	(13,035,259)
7.	Total Debt Service on Bonds	(102,012,245)
8.	Net Operating Revenue after Bonds	11,648,824
	NONOPERATING INCOME;	
9.	Interest Income	6,719,467
10.	Grant Income	4,502,326
11.	Total Nonoperating Income	11,221,793
	OTHER OBLIGATIONS:	
12.	Direct Interdepartmental Charges	(34,351,130)
13.	Transfer of Interest Income to General Fund	(4,138,000)
14.	Renewal and Replacement Fund Transfers	(5,349,928)
15.	Renewal and Replacement Project Expenditures	0
16.	Total Other Obligations	(43,839,058)
17.	Net Operating Balance for Current Year	(20,968,441)
18.	Net Balance at Beginning of Fiscal Year	20,968,441
19.	Net Balance at End of Fiscal Year	$0

CITY OF PHILADELPHIA-WATER DEPARTMENT

SUPPLEMENTAL SCHEDULE OF RATE COVENANT COMPLIANCE FOR THE FISCAL YEAR ENDED JUNE 30, 1990 (Amounts in Thousands of Dollars)(Legally Enacted Basis)

Pursuant to section 4.03(b) of the General Water and Sewer Revenue Bond Ordinance of 1974 (Bill No. 1263), the City is required to impose, charge and collect in each Fiscal Year rates and charges at least sufficient, together with that portion of the unencumbered amount of the operating funds balances available and reserved for appropriation for the payment of Operating Expenses at the commencement of such Fiscal Year, which together with all other project revenues to be received in such Fiscal Year, shall equal not less than the greater of:

A. The sum of:

(i) all Net Operating Expenses payable during such Fiscal Year;

(ii) 150% of the amount required to pay the principal of and interest on all Bonds issued and outstanding hereunder which will become due and payable during such Fiscal Year; and

(iii) the amount, if any, required to be paid into the Sinking Fund Reserve during such Fiscal Year; or

B. The sum of:

(i) all Operating Expenses payable during such Fiscal Year; and

(ii) all Sinking Fund deposits required during such Fiscal Year in respect of all outstanding Bonds and in respect of all outstanding general obligation bonds issued for improvements to the water or sewer systems and all amounts, if any required during such Fiscal Year to be paid into the Sinking Fund Reserve.

Coverage is computed as follows:

Coverage A	
Line 4	113,661,069
+ Line 11	11,221,793
+ Line 18	20,968,441
	145,851,303
/ Line 5	(88,976,986)
= Coverage A	(1.64)

Coverage B	
Line 4	113,661,069
+ Line 11	11,221,793
- Line 12	(34,351,130)
+ Line 18	20,968,441
	111,500,173
/ Line 7	(102,012,245)
= COVERAGE B	(1.09)

APPENDIX III

Summaries of the Act, the 1974 General Ordinance, the Sixteenth Supplemental Ordinance and the 1989 General Ordinance

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further legislation; (ii) those bulk payments which may be imposed under existing legislation or which are provided under existing agreements or are the subject of an expression of intent by the prospective obligor deemed reliable by the chief fiscal officer of the City; and (iii) those governmental subsidies or payments which, under existing legislation, are subject to reasonably precise calculation and, unless stated in such legislation or authorization to be of an annually or more frequently recurring nature, are payable in such year.

Detail of Bonds and City Covenants

The Act provides that the ordinance authorizing the issuance of the Bonds shall fix the aggregate amount of Bonds to be issued from time to time and determine, or designate officers of the City to determine the form and details of the Bonds. The City may include in its bond ordinance various covenants with bondholders, including covenants governing the imposition, collection and disbursement of project revenues, project operation and maintenance, the establishment, segregation, maintenance, custody, investment and disbursement of sinking funds and reserves, the issuance of additional priority or parity Bonds, the redemption of Bonds and such other provisions as the City deems necessary or desirable in the interest or for the protection of the City or of such bondholders. Under the Act the covenants, terms and provisions of the bond ordinance made for the benefit of bondholders constitute contractual obligations of the City, but such covenants (within limitations, if any, fixed by the bond ordinance) may be modified by agreement with a majority in interest of the bondholders or such larger portion thereof or may be provided in the bond ordinance.

Sinking Fund

The Act requires that the bond ordinance shall provide for the establishment and maintenance of a sinking fund or shall designate a previously established sinking fund for the payment of the principal of and interest on the Bonds. Payment into such sinking fund shall be made in annual or more frequent installments and shall be sufficient to pay or accumulate for payment all principal of or interest on the Bonds for which the sinking fund is established as and when the same shall become due and payable. The sinking fund shall be managed by the chief fiscal officer of the City and moneys therein to the extent not currently required shall be invested, subject to limitations established by the bond ordinance and the Act. Interest and profits from investment of moneys in the sinking fund shall be added to such fund and may be applied in reduction of or to complete required deposits to the sinking fund. Excess moneys in the sinking fund shall be repaid to the City for its general purposes. All moneys deposited in the sinking fund are subjected to a perfected security interest for the Bonds for which the fund is established until properly disbursed. This perfected security interest also applies, under the terms of the Act, to moneys in the sinking fund reserve created as part of the sinking fund by the 1974 General Ordinance.

Refunding

Bonds from time to time outstanding under the Act or other bonds issued for purposes for which Bonds are issuable under the Act, whether issued before or after the effective date of the Act, may be refunded by Bonds issued under the Act and are subject to the same protections and provisions required for the issuance of an original issue of Bonds. The refunding provisions of the Act permit "advance refunding", provided that the maturity date of the refunding bonds is not later than ten years after the last stated maturity date of the bonds to be refunded. If outstanding bonds are refunded in advance of their maturity or redemption date, the principal of and interest to payment or redemption date and redemption premium payable, if any, will no longer be deemed to be outstanding obligations when the City shall have deposited with a bank, bank and trust company or trust company funds irrevocably pledged to the purpose, which are represented by demand deposits, interest-bearing time accounts, savings deposits, certificates of deposit (insured or secured as public funds) or specified public obligations of the United States or of the Commonwealth of Pennsylvania (the "Commonwealth") sufficient to effect such redemption or payment or, if interest on deposited funds to the time of disbursement is also pledged, sufficient, together with such interest, for such purpose and, in the case of redemption, shall have duly called the bonds for redemption or given irrevocable instructions to give notice of such call.

Validity of Proceedings; Suits and Limitations Thereon

Prior to the delivery of any Bonds, the City must file with the Court of Common Pleas of Philadelphia County (the "Court") a transcript of the proceedings authorizing the issuance of the Bonds. If no action is brought on or before the twentieth day following the date of recording of the transcript, the validity of the proceedings, the City's right to issue the Bonds, the lawful nature of the purpose for which the Bonds are issued, and the validity and enforceability of the Bonds in accordance with their terms may not thereafter be inquired into judicially, in equity, at law, or by civil or criminal procedures, or otherwise, either directly or collaterally, except where a constitutional question is involved.

Negotiable Instruments

The Act provides that Bonds issued thereunder shall have the qualities and incidents of securities under Article 8 of the Uniform Commercial Code of the Commonwealth and shall be negotiable instruments.

Exemption from State Taxation

The Commonwealth pledges with the holders from time to time of Bonds issued under the Act that such Bonds, their transfer and the income therefrom, including any gains made on the sale thereof (other than underwriting profits in a distribution thereof), shall at all times be free from taxation within and by the Commonwealth, but this exemption does not extend to underwriting profits or to gift, succession or inheritance taxes or any other taxes not levied directly on the Bonds, the receipt of income therefrom or the realization of gains on the sale thereof.

Defaults and Remedies

If the City should fail to pay the principal of or interest on any Bonds when the same shall be due and payable, the remedy provisions of the Act permit the holder of such Bond, subject to the limitations described below, to recover the amount due in an action in the Court; but a judgment rendered in favor of the bondholder in such an action is collectible only from Project Revenues. The holders of 25% in aggregate principal amount of Bonds which are in default, whether because of failure of timely payment which is not cured within 30 days, or failure of the City to comply with any other provisions of the Bonds or any Bond ordinance, may appoint a trustee to represent them. On being appointed, the trustee shall be the exclusive representative for the affected bondholders and the individual right of action described above shall no longer be available. The trustee may, and upon written request of the holders of 25% in aggregate principal amount of the Bonds and on being furnished with indemnity satisfactory to it, shall take one or more of the following actions, which, if taken, shall preclude similar action, whether previously or subsequently initiated, by individual holders of Bonds: enforce, by proceedings at law or in equity, all rights of the holders of the Bonds; bring suit on the Bonds; bring suit in equity to require the City to make an accounting for all pledged Project Revenues received and to enjoin unlawful action or action in violation of the holders' rights; and, after 30 days' written notice to the City, declare the unpaid principal of the Bonds to be immediately due and payable, together with interest thereon at the rates stated in the Bonds until final payment, and upon the curing of all defaults, to annul such declaration. In any suit, action or proceeding by or on behalf of the holders of defaulted Bonds, trustee fees and expenses, including operating costs of a project and reasonable counsel fees, as all such costs and expenses are allowed by the Court, shall be deemed additional principal due on the Bonds and shall be paid in full from any recovery prior to any distribution to the holders of the Bonds. The 1974 General Ordinance limits any such recovery to Project Revenues. The trustee shall make distribution of any sums so collected in accordance with the Act.

Refunding with General Obligation Bonds

Upon certification with the City's chief fiscal officer that project revenues pledged for the payment of Bonds have become insufficient to meet the requirements of the ordinance or ordinances under which the Bonds were issued, the City Council is empowered, but not required, subject to applicable Commonwealth constitutional debt limitations, to authorize the issuance and sale of general obligation refunding bonds of the City, without limitation as to rate of interest, in such principal amount (subject to the aforesaid limitations on indebtedness) as may be required, together with other available funds, to pay and redeem such Bonds, together with interest to the payment or redemption date and redemption premium, if any.

THE 1974 GENERAL ORDINANCE

(Ordinance of City Council approved May 16, 1974 – Bill No. 1263, as amended by Ordinance of the City Council approved December 7, 1978 – Bill No. 1685, Ordinance of the City Council approved March 27, 1980 – Bill No. 52, Ordinance of the City Council approved September 24, 1981 – Bill No. 834 and Ordinance of the City Council approved June 21, 1984 – Bill No. 93)

Pursuant to the authorization contained in the Act, the City has adopted the 1974 General Ordinance. Under the 1974 General Ordinance the City has made a pledge of, and has granted a security interest in all Project Revenues (as hereinafter defined) and all accounts, contract rights and general intangibles representing Project Revenues of the Water Department of the City for the security and payment of the principal of, interest on and redemption premium (if any) on all Bonds issued under the 1974 General Ordinance.

Project Revenues are defined in the 1974 General Ordinance to include all rents, rates and charges imposed or charged by the City upon the owners or occupants of properties connected to, and upon all users of, the water and sewer systems of the City and all other Project Revenues (as such term is defined in the Act) derived from such system, and all accounts, contract rights and general intangibles representing the Project Revenues. Under the Act, Project Revenues mean, in respect of a project, all rents, rates, tolls and charges imposed or charged for the use or product of or services generated from the project to the ultimate users or customers thereof, all payments under bulk contracts with municipalities, government instrumentalities or other bulk users, all subsidies or payments payable by Federal, state or local governments or governmental agencies on account of the cost of operation of the project, or the payment of the principal of or interest on moneys borrowed to finance the cost of the project, and may include reasonable estimates of all interest on and profits from investment of moneys derived from the foregoing.

Issuance of Bonds

Bonds may be issued in one or more series as the City may from time to time determine by supplemental ordinance (a "Supplemental Ordinance"). The 1974 General Ordinance provides for the method of setting the details and terms of the Bonds authorized by such Supplemental Ordinance including the requirement that the Supplemental Ordinance contain a finding that Project Revenues will be sufficient to comply with the Rate Covenant set forth in the 1974 General Ordinance. The 1974 General Ordinance sets forth the manner of making payment of principal, interest and premium, requirements governing such payment, the rules regarding registration, transfer and exchange of Bonds, and general provisions governing redemption and the effect thereof. The 1974 General Ordinance authorizes the issuance of definitive and temporary Bonds, provides for the execution of the Bonds and provides for the issuance of Bonds to replace mutilated, destroyed, lost or stolen Bonds.

Purposes For Which Bonds May Be Issued; Conditions of Issuance – Engineering Report

Bonds may be issued to (1) pay the cost of projects related to the water and sewer systems, (2) reimburse any City fund from which such costs shall have been paid or advanced, (3) fund any such cost for which the City shall have outstanding bond anticipation notes or other obligations, (4) refund any Bonds of the City issued for such purposes under the Act, or (5) refund any general obligation bonds of the City issued for the foregoing purposes. However, the City also covenants that it will not refund, by the issuance of Bonds, general obligation bonds or notes issued prior to January 1, 1974.

The City covenants so long as any Bonds shall remain outstanding, no Bonds will be issued unless the financial report of the City's chief fiscal officer required by the Act to be filed with the City Council in connection with such issuance shall be accompanied by an engineering report of an independent registered consulting engineer or an independent firm of registered consulting engineers, in either case having broad experience in the design and analysis of the operation of water and sewer systems of the magnitude and scope of the City's water and sewer systems and a favorable reputation for competence in such field. The report must contain a statement that the engineers have made an investigation of physical properties included in both systems and of the books and records of the Water Department. Also, prior to the issuance of the Bonds, a transcript of the proceedings authorizing the issuance of the Bonds shall be filed with the Fiscal Agent, together with a copy of the engineering report.

On the basis of such investigation the engineering report must contain the same matters, statements and opinions as are required to be contained in the report of the chief fiscal officer to the City Council, namely (1) a brief description of the project or projects for which the Bonds are to be issued, (2) a statement identifying the sources from which the pledged Project Revenues are to be derived, (3) a statement that on the basis of actual and estimated future annual financial operations of the project from which the pledged Project Revenues are to be derived, the project will, in the opinion of the engineers, yield pledged Project Revenues over the amortization period of such Bonds sufficient to meet the payment or deposit requirements of operating expenses, reserve requirements, and debt service on all Bonds outstanding for which Project Revenues are pledged and surplus requirements of the 1974 General Ordinance, or the Supplemental Ordinance authorizing the issuance of any series of Bonds, and (4) that the revenues upon which the preceding statements are based comply with the definition of "Project Revenues" contained in the Act. The 1974 General Ordinance also requires that the engineering report state that the water and sewer rents, rates and charges, on the basis of which the foregoing statements are made, are currently and will be sufficient to comply with the Rate Covenant and that the water and sewer systems are in good operating condition or that adequate steps are being taken to make them so.

Security

The Bonds are and will be equally and ratably secured by a pledge of and a security interest in all Project Revenues and the Sinking Fund, including the Sinking Fund Reserve.

Priority in Application of Project Revenues

Prior to default, the General Ordinance establishes the following priorities in the application of Project Revenues during each fiscal year:

First, to Net Operating Expenses (as defined in the 1974 General Ordinance);

Second, to required payments in to the Sinking Fund to pay the principal of and interest on all Bonds issued under the 1974 General Ordinance and to accumulate, or to restore any deficiency in, the Sinking Fund Reserve;

Third, to the payment of general obligation bonds which have been adjudged to be self-liquidating on the basis of expected revenues from the water and sewer systems; and

Fourth, to the payment of Interdepartmental Charges and interest and sinking fund charges of other general obligation debt, incurred for the water and sewer systems.

Rate C enant

The City covenants that it has authorized, by its Code of General Ordinances, as amended, the imposition of rates and charges by the Water Department sufficient to comply with the Rate Covenant in the 1974 General Ordinance, and that it will not repeal or materially adversely dilute such authorization.

The Rate Covenant requires the City, at a minimum, to impose, charge and collect in each fiscal year such water and sewer rents, rates and charges as shall, together with that portion of the unencumbered amount of the operating funds balances, if any, of the Water Department available and reserved for appropriation for the payment of Operating Expenses, at the commencement of such fiscal year and together with all other Project Revenues to be received in such fiscal year, equal not less than the greater of:

A. The sum of:

(i) all Net Operating Expenses payable during such fiscal year;

(ii) 150% of the amount required to pay the principal of and interest on all Bonds issued and outstanding under the 1974 General Ordinance which will become due and payable during such fiscal year; and

(iii) the amount, if any, required to be paid into the Sinking Fund Reserve during such fiscal year; or

B. The sum of:

(i) all Operating Expenses payable during such fiscal year; and

(ii) all Sinking Fund deposits required during such fiscal year in respect to all outstanding Bonds and in respect to all outstanding general obligation bonds issued for improvements to the water or sewer systems and all amounts, if any, required during such fiscal year to be paid into the Sinking Fund Reserve.

Operating Expenses are defined in the 1974 General Ordinance to be all costs and expenses of the Water Department necessary and appropriate to operate and maintain the water and sewer systems in good operable condition during each fiscal year of the City, including, without limitation, salaries and wages, purchases of services by contract, costs of materials, supplies and expendable equipment, maintenance costs, costs of any property or the replacement thereof or for any work or project, related to the water and sewer systems, which does not have a probable useful life to the City of at least five years, pension and welfare plan and workmen's compensation requirements, provisions for claims, refunds and uncollectible receivables and for Interdepartmental Charges, all in accordance with generally accepted municipal accounting principles consistently applied, but shall exclude depreciation and interest and sinking fund charges.

Net Operating Expenses are defined in the 1974 General Ordinance to be Operating Expenses exclusive of Interdepartmental Charges.

Interdepartmental Charges are defined in the 1974 General Ordinance to be the proportionate charges for services performed for the Water Department by all officers, departments, boards or commissions of the City which are required by the Home Rule Charter of the City to be included in the computation of Operating Expenses of the Water Department.

Additional Covenants

The City further covenants that it will pay or cause to be paid from the Project Revenues the principal of and interest on all Bonds as the same become due and payable and that it will not in any fiscal year pay from Project Revenues sinking fund charges for general obligation water and sewer bonds or Interdepartmental Charges unless prior to or concurrently with such payment it shall satisfy all Sinking Fund requirements on Bonds for such fiscal year. The City also has a general obligation to maintain or cause to be maintained and operate or cause to be operated the water and sewer systems.

As amended in the Seventh Supplemental Ordinance, approved September 24, 1981, Bill No. 834, the City covenants, subject to the availability of funds, to deposit in a Renewal and Replacement Fund from Project Revenues of the water and sewer systems in the last month of each fiscal year, commencing in Fiscal Year 1984, an amount not less than 50% of (i) interest income earned on moneys held in all capital improvement funds of the Water Department plus interest earned on moneys held in the Water and Sewer Revenue Bond Sinking Fund Reserve less (ii) the maximum amount permitted to be transferred to the City pursuant to Section 7 of the Fifth Supplemental Ordinance, as amended. The City is not obligated to make a deposit in any year in excess of a sum which together with the balance in the Renewal and Replacement Fund on the first day of the next ensuing fiscal year will exceed 25% of the maximum annual debt service requirement for all Bonds then outstanding. If, prior to the last quarter of a fiscal year, the Water Commissioner estimates that the required deposit or a portion thereof will not be available from operating funds in the current fiscal year, the operating budget for the next fiscal year shall include the estimated deficiency as an appropriation from Project Revenues. The Renewal and Replacement Fund shall be held by the Fiscal Agent of the City in an account separate and apart from all other accounts of the City. Amounts in the Renewal and Replacement Fund may only be used at the direction of the Water Commissioner for payment of capital costs of the water and sewer systems or, in certain circumstances, at the direction of the Director of Finance for operating purposes of the Water Department. The Fiscal Agent has been granted a security interest in moneys in the Renewal and Replacement Fund on behalf of holders of all Bonds.

Report Requirements

The City shall file with the Fiscal Agent not later than 120 days after the close of each fiscal year a report of the operation of the water and sewer systems, including specified financial data, showing compliance with the Rate Covenant and accompanied by a certificate of the Water Commissioner that the water

and sewer systems are in good operating condition and a certificate of the Director of Finance that as of the date of such report the City has complied with all covenants and requirements of the 1974 General Ordinance and Supplemental Ordinances. Copies of such report will be available to bondholders and may be inspected and copied at all reasonable times by bondholders or their representatives.

General Obligation Water and Sewer Bonds — Junior Lien Revenue Bonds

The City reserves the right to finance water and sewer projects by issuing general obligation bonds or revenue bonds under authorization other than the 1974 General Ordinance, for the payment of which Project Revenues may be pledged, provided that such pledge is subject and subordinate to the prior payment in each fiscal year of all Sinking Fund requirements of all Bonds issued under the 1974 General Ordinance.

Sinking Fund and Sinking Fund Reserve

A Water and Sewer Revenue Bond Sinking Fund is established and consolidated for the benefit of the holders of all Bonds issued under the 1974 General Ordinance, which shall be held in an account separate and apart from all other accounts of the City. On or before each interest and principal payment date for the Bonds, the Director of Finance shall deposit in the Sinking Fund from Project Revenues such amounts as will, together with interest and profits on investments held therein, be sufficient to pay the principal of and interest on the Bonds. CoreStates Bank, N.A., successor to The Philadelphia National Bank, as Fiscal Agent of the City, is designated by the 1974 General Ordinance as Fiscal Agent, Sinking Fund Depositary, paying agent and registrar of the Bonds, but the City reserves the right to change such designation or to make additional appointments. Fidelity Bank, National Association has been appointed as Fiscal Agent, effective June 4, 1991, replacing CoreStates Bank, N.A. The moneys in the Sinking Fund are required to be secured and invested and reinvested under the management of the Director of Finance.

The Sinking Fund Reserve is established as a separate account in the Sinking Fund and is to be held by the Sinking Fund Depositary. The Sinking Fund Reserve shall be funded from the proceeds of each series of Bonds in an amount equal to the maximum amount required in any fiscal year to pay the debt service on the Bonds of such series becoming due and payable in such fiscal year, unless the Supplemental Ordinance authorizing the issuance of such series provides for the funding of such amount from Project Revenues over a period of not more than six fiscal years after the issuance and delivery of such Bonds. The City has not elected to fund the Sinking Fund Reserve from Project Revenues in respect of the Sixteenth Series Bonds or any prior series.

The money and investments (valued at market) in the Sinking Fund Reserve shall be maintained in an amount equal at all times to the maximum principal and interest requirements in any subsequent fiscal year of all Bonds issued and outstanding under the 1974 General Ordinance. If at any time the moneys in the Sinking Fund, other than in the Sinking Fund Reserve, are insufficient to pay when due the principal of (and premium, if any) or interest on any Bond or Bonds, the Sinking Fund Depositary shall withdraw from the Sinking Fund Reserve and pay to the Fiscal Agent the amount of such deficiency. If by reason of such withdrawal or for any other reason there shall be a deficiency in the Sinking Fund Reserve, the City covenants to restore such deficiency by daily deposits of at least 50% of Project Revenues.

Transfer of Income on Sinking Fund Reserve and Capital Improvement Funds

The 1974 General Ordinance requires that all interest and income earned on moneys held in the Water Department's capital improvement funds be transferred to the Water Department's operating funds to be applied as Project Revenues in accordance with the terms of the 1974 General Ordinance. The 1974 General Ordinance also provides that all interest and income earned on moneys held in the Sinking Fund Reserve may be transferred by the Director of Finance to the Water Department's operating funds to be so applied. To the extent that in any fiscal year a remaining balance exists in these operating funds, such balance may be applied to any proper purpose of the City, including the City's General Fund, provided that in a given fiscal year the amount of the balance so applied does not exceed the lowest of (i) the amount of the Sinking Fund Reserve earnings transferred to the operating funds during the same fiscal year or (ii) the amount of capital improvement funds earnings transferred to the operating funds during the same fiscal year or (iii) $4,994,000.

Remedies; Limitation of Liability of City

In addition to the remedies provided by the Act, if the City shall fail or neglect to make deposits into the Sinking Fund, including the Sinking Fund Reserve, in the amounts and at the times required by the 1974 General Ordinance or if for any reason moneys in the Sinking Fund shall be insufficient to pay debt service on any Bonds or if there shall be a deficiency in the Sinking Fund Reserve the City shall immediately and without notice deposit on a daily basis 50% of all Project Revenues, or such greater percentage thereof as the Director of Finance shall determine, in the Sinking Fund, including the Sinking Fund Reserve, so long as such default or deficiency shall continue. The 1974 General Ordinance provides that all remedies are enforceable only against pledged Project Revenues and investments thereof, and that no decree or judgment against the City on an action brought under the provisions of the 1974 General Ordinance shall order or be construed to permit the occupation, attachment, seizure or sale upon execution of any other property of the City.

Amendments

The 1974 General Ordinance and any Supplemental Ordinance may be amended without the consent of any bondholders to cure ambiguities, formal defects or omissions, or to grant to bondholders or any trustee therefor additional rights or security, to comply with mandatory provisions of state of Federal law or with permissive provisions of such law which do not substantially impair the security or rights to payment of bondholders. The 1974 General Ordinance may be amended in such other respects as may be authorized by 67% in principal amount of the holders of Bonds outstanding and affected, but no alteration of the amount, rate or time of payment, respectively, of the principal and interest or of the redemption provisions may be made without the consent of the holders of all Bonds outstanding and affected.

Amendments Not Affecting Outstanding Bonds

The 1974 General Ordinance or any part thereof may be amended and the foregoing covenants (including the Rate Covenant) may be rescinded, amended or supplemented by further covenants and agreements from time to time by Supplemental Ordinance, but no such amendments or further provisions, terms covenants or agreements contained in a Supplemental Ordinance, other than those permitted by, and adopted pursuant to, Section 8.01 of the 1974 General Ordinance governing amendments generally, which shall be inconsistent with, or would impair a prior covenant in, the 1974 General Ordinance as at the time amended or supplemented, shall become effective until all Bonds the holders of which are entitled to the protection of, or to enforce compliance with, such prior provisions or covenants, shall cease to be outstanding.

THE SIXTEENTH SUPPLEMENTAL ORDINANCE
(Ordinance of City Council approved May 2, 1991
Bill No. 1366)

The Sixteenth Supplemental Ordinance authorizes the Mayor, City Controller and the City Solicitor (the "Bond Committee"), or a majority of them, to sell the Sixteenth Series Bonds at either a public competitive sale to the highest bidder or bidders or at a private negotiated sale, in an aggregate principal amount not to exceed three hundred fifty million dollars ($350,000,000). The Sixteenth Supplemental Ordinance provides that the Sixteenth Series Bonds shall bear interest at a prescribed fixed rate or rates, including variable rates (not exceeding any limitation prescribed by law) which may be payable in different modes. The Sixteenth Supplemental Ordinance specifies the applicability of sections of the Act, the 1974 General Ordinance and the 1989 General Ordinance. It also authorizes the Bond Committee to enter into agreements with any appropriate entity providing credit, payment or liquidity sources for the Sixteenth Series Bonds.

The Sixteenth Supplemental Ordinance states that the Sixteenth Series Bonds are to be issued to finance certain capital costs of the water and sewer systems of the City incurred or to be incurred.

As additional security for the Sixteenth Series Bonds and commencing on the date of issuance of the Sixteenth Series Bonds, the Sixteenth Supplemental Ordinance establishes a separate City of Philadelphia Water Account to be held exclusively for Water Department purposes (the "Water Account"). The Water Account shall be held by the Fiscal Agent for the deposit of the proceeds of the Sixteenth Series Bonds and

the Project Revenues, as they are collected or received and shall be held in the Water Account as a segregated account in respect of the water and wastewater systems and for the benefit of the Holders of all Bonds issued under the 1974 General Ordinance, so long as the Sixteenth Series Bonds shall remain outstanding.

The City covenants (i) to maintain the Water Account as a legally segregated account to be held by the Fiscal Agent separate and apart from all other funds and accounts of the City and the Water Account shall not be commingled with the consolidated cash account or any other fund or account of the City not held exclusively for Water Department purposes; and (ii) while the Sixteenth Series Bonds are outstanding, it will not make temporary loans or advances of bond proceeds or Project Revenues from the Water Account, the Sinking Fund, the Sinking Fund Reserve and the Renewal and Replacement Fund or any other fund or account of the City held exclusively for Water Department purposes by the Fiscal Agent to any City account not held exclusively for Water Department purposes.

The Sixteenth Supplemental Ordinance establishes within the Water Account two subaccounts for accounting purposes into which deposits and from which disbursements shall be made for operating and capital purposes.

If at any time sufficient moneys are not available in the subaccount maintained in the Water Account for operating purposes, then amounts on deposit in the subaccount of the Water Account maintained for capital purposes may be loaned temporarily until required by the Water Department for capital purposes for the payment of operating expenses to the extent of the deficiency. If a similar deficiency exists in the subaccount maintained in the Water Account for capital purposes, amounts on deposit in the operating subaccount may be loaned temporarily until required by the Water Department for operating purposes for the payment of capital expenditures, to the extent of the deficiency.

Based on the report of the Director of Finance filed with the City Council pursuant to the Act, the Sixteenth Supplemental Ordinance determines that Project Revenues will be sufficient to comply with the Rate Covenant contained in the 1974 General Ordinance and to pay all costs, expenses and payments required to be paid therefrom in the order of priority as set forth in the 1974 General Ordinance. The City covenants in the Sixteenth Supplemental Ordinance that, so long as any Sixteenth Series Bonds remain outstanding, it will make payments or cause payments to be made out of the Water and Sewer Revenue Bond Sinking Fund at such times and in such annual amounts as shall be sufficient to pay interest on and principal of all Sixteenth Series Bonds when due, and as of the effective date of the 1989 General Ordinance, the City will make such payments or cause such payments to be made out of the Sinking Fund established under the 1989 General Ordinance. The Sixteenth Supplemental Ordinance authorizes the Director of Finance to take such action with respect to investment of proceeds and authorizes the Director of Finance and any member of the Bond Committee to make such covenants as may be necessary or advisable to assure that the Sixteenth Series Bonds will not be "arbitrage bonds" as defined in the Internal Revenue Code of 1986, as amended, in order to otherwise effect or maintain the exclusion of interest on the Sixteenth Series Bonds from gross income for Federal income tax purposes.

The Sixteenth Supplemental Ordinance provides for the deposit of a portion of the proceeds from the sale of the Sixteenth Series Bonds into the Sinking Fund Reserve created under the 1974 General Ordinance in an amount not exceeding the maximum amount required in any fiscal year to pay principal and interest on the Sixteenth Series Bonds becoming due in such fiscal year or ten percent of the proceeds of the Sixteenth Series Bonds, as determined by the Bond Committee (the "Sixteenth Series Reserve Requirement"); provided that, the Sixteenth Series Reserve Requirement shall not cause the Sixteenth Series Bonds to be "arbitrage bonds" as defined in the Internal Revenue Code of 1986, as amended.

Upon the effective date of the 1989 General Ordinance, the provisions of the 1989 General Ordinance shall be applicable to the Sixteenth Series Bonds without further action by City Council.

SUMMARY OF 1989 GENERAL ORDINANCE

Definition of Terms Used Therein

All references herein to the "Revenue Account", "Sinking Fund", "Subordinated Bond Fund", "Rate Stabilization Fund", "Capital Account", "Construction Fund", "General Account", and "Rebate Fund" shall mean the Funds and Accounts so designated which are established pursuant to the 1989 General Ordinance.

"Act" means The First Class City Revenue Bond Act approved October 18, 1972 (Act No. 234, 53 P.S. 15901 to 15924) as from time to time amended.

"Bond" or "Bonds" means any water and wastewater revenue bond or note of the City (excluding a bond anticipation note) issued and outstanding pursuant to the Act under the 1989 General Ordinance, as supplemented by any Supplemental Ordinance.

"Bond Counsel" means a firm of nationally recognized bond counsel selected by the City.

"Bondholder" or "Holder" means any registered owner of Bonds or Holder of Bonds issued in coupon form.

"Capital Account Deposit Amount" means an amount equal to 1% of the depreciated value of property, plant and equipment of the System or such greater amount as shall be annually certified to the City in writing by a Consulting Engineer as sufficient to make renewals, replacements and improvements in order to maintain adequate water and wastewater service to the areas served by the System.

"City" means the City of Philadelphia, Pennsylvania.

"City Controller" means the head of the City's auditing department as provided by the Philadelphia Home Rule Charter.

"City Solicitor" means the head of the City's law department as provided by the Philadelphia Home Rule Charter.

"Code" means the Internal Revenue Code of 1986, as amended.

"Consulting Engineer" means a nationally recognized independent registered consulting engineer or a nationally recognized independent firm of registered consulting engineers, in either case having experience in the design and analysis of the operation of water and wastewater systems of the magnitude and scope of the System.

"Debt Service Requirements", with reference to a specified period, means:

A. amounts required to be paid into any mandatory sinking fund established for the benefit of Bonds during the period;

B. amounts needed to pay the principal or redemption price of Bonds maturing during the period and not to be redeemed at or prior to maturity through any sinking fund established for the benefit of Bonds; and

C. interest payable on Bonds during the period, with adjustment for capitalized interest or redemption through any sinking fund established for the benefit of Bonds.

For purposes of estimating Debt Service Requirements for any future period, any Option Bond outstanding during such period shall be assumed to mature on the stated maturity date thereof, except that the principal amount of any Option Bond tendered for payment and cancellation before its stated maturity date shall be deemed to accrue on the date required for payment pursuant to such tender.

Calculation of Debt Service Requirements with respect to Variable Rate Bonds shall be subject to adjustment as permitted by the Section entitled "Rate Covenant".

"Debt Service Withdrawal" means the aggregate amount withdrawn from the Capital Account during a Fiscal Year and applied toward the payment of principal or redemption price of or interest on Bonds or toward the elimination of a deficiency in any reserve fund established for the benefit of Bonds.

"Determination" means a determination regarding certain matters relating to the issuance of a Series of Bonds, made by officers of the City authorized pursuant to the Supplemental Ordinance providing for the issuance of such Series of Bonds.

"Director of Finance" means the chief financial, accounting and budget officer of the City, as established by the Philadelphia Home Rule Charter.

"Fiscal Agent" means a bank or other entity designated as such pursuant to the 1989 General Ordinance or its successor.

"Fiscal Year" means the fiscal year of the City.

"General Obligation Bonds" means the general obligation bonds of the City outstanding as of the date of enactment of this Ordinance issued to finance improvements to the System and adjudged to be self-liquidating on the basis of expected Project Revenues.

"Government Obligations" means direct obligations of, or obligations the principal of and interest on which are unconditionally guaranteed by, the United State of America.

"Independent" means a person who is not a salaried employee or elected or appointed official of the City; provided, however, that the fact that such person is retained regularly by or transacts business with the City shall not make such person an employee within the meaning of this definition.

"Initial Deposit" means the initial, one time deposit to be made by the City from any source into the Rate Stabilization Fund upon the establishment of such Rate Stabilization Fund and the effective date of the 1989 General Ordinance.

"Interdepartmental Charges" means the proportionate charges for services performed for the Water Department by all officers, departments, boards or commissions of the City which are required by the Philadelphia Home Rule Charter to be included in the computation of operating expenses of the Water Department.

"Interim Debt" means any bond anticipation notes (other than any bond anticipation notes outstanding as of the date of enactment of the 1989 General Ordinance) or other temporary borrowings which the City anticipates, permanently financing with Bonds or other long term indebtedness under the 1989 General Ordinance or otherwise.

"Net Revenues" for any period means the Project Revenues collected during such period and deposited into the Revenue Account plus (x) the amounts, if any, transferred from the Rate Stabilization Fund into the Revenue Account during such period and (y) interest earnings during such period on moneys in any of the funds or accounts established under the 1989 General Ordinance to the extent such interest earnings are credited to the Revenue Account minus (z) the sum of (a) Operating Expenses incurred during such period and (b) the amounts, if any, transferred from the Revenue Account to the Rate Stabilization Fund during such period; provided, however, that in determining such Net Revenues the Initial Deposit to the Rate Stabilization Fund shall not reduce such Net Revenues.

"1974 General Ordinance" means the General Water and Sewer Revenue Bond Ordinance of 1974 approved May 16, 1974 as amended and supplemented from time to time.

"1989 General Ordinance" means the General Water and Wastewater Revenue Bond Ordinance of 1989 approved May 18, 1989.

"Operating Expenses" means all costs and expenses of the Water Department necessary and appropriate to operate and maintain the System in good operating condition during each Fiscal Year of the City, and shall include, without limitation, salaries and wages, purchases of services by contract, costs of materials, supplies and expendable equipment, maintenance costs, costs of any property or the replacement thereof or for any work or project, related to the System, which is not properly chargeable to property, plant and equipment, pension and welfare plan worker's compensation requirements, provisions for claims, refunds and uncollectible receivables and for Interdepartmental Charges, all in accordance with generally accepted accounting principles consistently applied, but Operating Expenses shall exclude depreciation, amortization, interest and sinking fund charges.

"Operating Expense Withdrawal" means the aggregate amount withdrawn from the Capital Account during a Fiscal Year and applied toward the payment of Operating Expenses.

"Option Bond" means any Bond which by its terms may be tendered by and at the option of the Holder thereof for payment by the City prior to its stated maturity date or the maturity date of which may be extended by and at the option of the Holder thereof.

"Philadelphia Home Rule Charter" means the Philadelphia Home Rule Charter, as amended or superseded by any new home rule charter, adopted pursuant to authorization of the First Class City Home Rule Act approved April 21, 1949, P.L. 665 et seq. (53 P.S. 13101 et seq.).

"Project" shall have the meaning assigned to it in the Act, as the same may be amended from time to time.

"Project Revenues" means all rents, rates, fees and charges imposed or charged for the use or product of or services generated by the System to the ultimate users or customers thereof, all payments under bulk contracts with municipalities, governmental instrumentalities or other bulk users, all subsidies or payments payable by Federal, State or local governments or governmental agencies on account of the cost of operation of, or the payment of the principal of or interest on moneys borrowed to finance costs chargeable to the System, all grants, payments and contributions made in aid or on account of the System and all accounts, contract rights and general intangibles representing the foregoing.

"Qualified Escrow Securities" means funds which are represented by (a) demand deposits, (b) interest bearing time accounts, savings deposits or certificates of deposit, (c) if at the time permitted under the Act, obligations of any state or political subdivision thereof or any agency or instrumentality of such state or political subdivision for which cash, Government obligations or a combination thereof have been irrevocably pledged to or deposited in a segregated escrow account for the payment when due of principal or redemption price of and interest on such obligations, and any such cash or Government Obligations pledged and deposited are payable as to principal or interest in such amounts and on such dates as may be necessary without reinvestment to provide for the payment when due of the principal or redemption price of and interest on such obligations, and such obligations are rated by each Rating Agency in the highest rating category assigned by each such rating service to obligations of the same type, or (d) noncallable obligations of the United States of America or the Commonwealth of Pennsylvania. In each case such funds (i) are subject to withdrawal, maturing or payable at the option of the holder, at or prior to the dates needed for disbursement, provided such deposits or accounts, whether deposited by the City or by such depository, are insured or secured as public deposits with securities having at all time a market value exclusive of accrued interest equal to the principal amount thereof, (ii) are irrevocably pledged for the payment of such obligations and (iii) are sufficient, together with the interest to disbursement date payable with respect thereto, if also pledged, to meet such obligations in full.

"Rate Covenant" means the rate covenant contained in the 1989 General Ordinance.

"Rating Agency" means Moody's Investors Service if such rating service has issued a credit rating on Bonds and Standard & Poor's Corporation if such rating service has issued a credit rating on Bonds or, upon discontinuance of either such rating service, by such other nationally recognized rating service if such rating service has issued a credit rating on Bonds.

"Series" when applied to Bonds means collectively, all of the Bonds of a given issue authorized by Supplemental Ordinance, and may also mean, if appropriate, a subseries of any Series if, for any reason, the City should determine to divide any Series into one or more subseries of Bonds.

"Subordinated Bond" means any Bond the security interest in and pledge and assignment of Project Revenues is not on a parity with other Bonds.

"Supplemental Ordinance" means an ordinance supplemental to the 1989 General Ordinance enacted pursuant to the Act and this Ordinance by the Council of the City.

"System" means the entire combined water system and wastewater system of the City, now existing and hereafter acquired by lease, direct control, purchase or otherwise or constructed by the City, including any interest or participation of the City in any facilities in connection with said System, together with all additions, betterments, extensions and improvements to said System or any part thereof hereafter constructed or acquired and together with all lands, easements, licenses and rights of way of the City and all other works, property or structures of the City and contract rights and other tangible and intangible assets of the City now or hereafter owned or used in connection with or related to said System.

"Variable Rate Bond" means any Bond, the rate of interest on which is subject to change prior to maturity and cannot be determined in advance of such change.

"Water Commissioner" means the head of the Water Department as provided by the Philadelphia Home Rule Charter.

"Water Department" means the Water Department of the City created pursuant to Section 3-100 of the Philadelphia Home Rule Charter.

Pledge of Revenues; Grant of Security Interest; Parity Bonds

The City pledges to the Fiscal Agent in trust for the security and payment of all Bonds (other than Subordinated Bonds) issued under the 1989 General Ordinance and grants to said Fiscal Agent a lien on and security interest in (i) all Project Revenues and (ii) all amounts on deposit in or standing to the credit of the funds and accounts (other than the Rebate Fund) established by the 1989 General Ordinance together with interest earnings on amounts in such funds and accounts (other than the Rebate Fund). The Fiscal Agent shall hold and apply the security interest granted and the pledged revenues and funds described in the 1989 General Ordinance, in trust, for the equal and ratable benefit and security of all Holders of Bonds (other than Subordinated Bonds) issued pursuant to the provisions of the 1989 General Ordinance and each Supplemental Ordinance, without preference, priority or distinction of any one Bond over any other Bond (other than Subordinated Bonds); provided however that the pledge of Project Revenues and funds and accounts pursuant to the 1989 General Ordinance may also be for the benefit of a letter of credit issuer, municipal bond insurance provider, or any other person who undertakes to provide moneys for the account of the City for the payment of principal or redemption price of and interest on any Series of Bonds (other than Subordinated Bonds), on an equal and ratable basis with Bonds, to the extent provided by any Supplemental Ordinance or Determination. All Bonds issued under the 1989 General Ordinance (other than Subordinated Bonds) shall be parity Bonds equally and ratably secured by the pledge of and grant of security interest as described herein without preference, priority or distinction as to lien or otherwise, except as otherwise provided, of any one Bond over any other Bond or as between principal and interest.

Establishment of Funds and Accounts

The following funds and accounts are established by the 1989 General Ordinance:

(a) Revenue Account (to be held by the City).

(b) Sinking Fund (to be held by the Fiscal Agent).

(c) Subordinated Bond Fund (to be held by the Fiscal Agent).

(d) Rate Stabilization Fund (to be held by the City).

(e) Capital Account (to be held by the City) as an account within the Construction Fund.

(f) General Account (to be held by the City).

(g) Construction Fund (to be held by the City), and within the Construction Fund, separate accounts (in addition to the Capital Account), designated as follows:

(i) the Existing Projects Account, into which existing proceeds, if any, of revenue bonds heretofore issued under the Act in respect of the System shall be deposited; and

(ii) the Bond Proceeds Account, into which proceeds of Bonds issued under the 1989 General Ordinance shall be deposited.

(h) Rebate Fund (to be held by the City).

Notwithstanding the provisions of the 1989 General Ordinance, so long as the Sixteenth Series Bonds are outstanding, the foregoing funds and accounts shall be held by the Fiscal Agent.

Transfer from Revenue Account to Other Funds and Accounts

Project Revenues collected by the City and deposited in the Revenue Account shall be applied, to the extent available, in the following manner and in the following order of priority:

(a) to pay Operating Expenses;

(b) to pay principal or redemption price of and interest on Bonds (other than Subordinated Bonds), principal and interest on bond anticipation notes outstanding on the date of enactment of the 1989 General Ordinance, and principal and/or interest on Interim Debt;

(c) to pay the amount, if any, required to eliminate any deficiency in any reserve fund or account established within the Sinking Fund for the equal and ratable benefit of all Bonds (other than Subordinated Bonds);

(d) to pay the amount, if any, required to eliminate any deficiency in any reserve fund or account established within the Sinking Fund and not held for the equal and ratable benefit of all Bonds (other than Subordinated Bonds);

(e) to pay the principal or redemption price of and interest on General Obligation Bonds;

(f) to pay the principal or redemption price of and interest on Subordinated Bonds, and interest on bond anticipation notes payable by exchange for, or out of the proceeds of the sale of Subordinated Bonds;

(g) to transfer the amount determined by the Water Commissioner to be deposited in the Rate Stabilization Fund;

(h) to transfer on June 1 of each Fiscal Year (or the first business day following June 1 if June 1 is not a business day) an amount equal to the sum of (i) the Capital Account Deposit Amount, (ii) the Debt Service Withdrawal for the preceding Fiscal Year and (iii) the Operating Expense Withdrawal for the preceding Fiscal Year, less any amounts transferred during the Fiscal Year to the Capital Account from the General Account; and

(i) to transfer to the General Account, as of June 30 of each Fiscal Year, the amount, if any, remaining on deposit in the Revenue Account.

Notwithstanding the foregoing, nothing in the 1989 General Ordinance shall prevent the City from transferring amounts on deposit in any fund or account established under the 1989 General Ordinance into the Rebate Fund in the amounts and at the times specified by the 1989 General Ordinance.

Sinking Fund

The Sinking Fund is a consolidated fund for the equal and proportionate benefit of the holders of all Bonds (other than Subordinated Bonds) from time to time outstanding and may be invested and reinvested on a consolidated basis.

The Fiscal Agent shall pay out of the Sinking Fund to the designated paying agent or agents the amount required for the interest payable on Bonds (other than Subordinated Bonds) on each interest payment date and the amount required for the principal, redemption price of or prepayment payable on Bonds (other than Subordinated Bonds) on each principal payment date. The Fiscal Agent shall also pay out of the Sinking Fund the accrued interest included in the purchase price of Bonds purchased for retirement.

The City may direct the Fiscal Agent to apply amounts accumulated in the Sinking Fund with respect to Bonds subject to mandatory sinking fund redemption, to the purchase of Bonds of the Series, maturity and interest rate within each maturity, subject to mandatory sinking fund redemption.

Subordinated Bond Fund

Subject to the third paragraph of this Section, the Fiscal Agent shall apply amounts in the Subordinated Bond Fund to the payment of the principal of, redemption premium, if any, and interest on Subordinated Bonds of a Series in accordance with the provisions of, and subject to the priorities and limitations and restrictions provided in, the Supplemental Ordinance authorizing such Series of Subordinated Bonds.

At any time and from time to time the City may deposit in the Subordinated Bond Fund for the payment of the principal of, redemption premium, if any, and interest on Subordinated Bonds, amounts received from any other source (other than from Project Revenues).

If at any time the amounts in the Sinking Fund shall be less than the current requirement of such fund pursuant to subparagraphs (b) and (c) of the paragraph entitled "Transfer from Revenue Account to Other Funds and Accounts" and there shall not be on deposit in the Capital Account or General Account available moneys sufficient to cure such deficiency, then the Fiscal Agent shall withdraw from the Subordinated Bond Fund and deposit in the Sinking Fund the amount necessary (or all the moneys in said fund, if less than the amount necessary) to eliminate such deficiency.

Capital Account

Amounts deposited in the Capital Account may be applied to (i) payments for the cost of renewals, replacements and improvements to the System; (ii) payments into the Sinking Fund or into any reserve fund established under a Supplemental Ordinance or into the Subordinated Bond Fund to cure a deficiency in one of the foregoing; or (iii) the purchase of Bonds if a Consulting Engineer shall first have certified to the City that amounts remaining on deposit in the Capital Account following the proposed purchase of Bonds will be sufficient to pay the cost of renewals, replacement and improvements to the System projected to be payable during such Fiscal Year; provided however, that no Bond shall be purchased at a price in excess of the principal amount and redemption price which would be applicable if the Bond were redeemed at the time such Bond was first subject to redemption.

If at any time sufficient moneys are not available for the payment of Operating Expenses, then amounts on deposit in the Capital Account may be used for the payment of Operating Expenses to the extent of the deficiency.

General Account

Amounts on deposit in the General Account may be used by the City (i) to pay Operating Expenses; (ii) to fund transfers to any fund or account established hereunder or under a Supplemental Ordinance (other than the Revenue Account and the Rate Stabilization Fund); (iii) for the payment of principal, redemption premium, if any, and interest on any revenue bonds or notes (the proceeds of which were applied in respect of the System) issued under ordinances other than Supplemental Ordinances pursuant to the Act; (iv) for the payment of principal, redemption premium, if any, and interest on any general obligation bonds issued in respect of the System and adjudged to be self-liquidating on the basis of expected Project Revenues; (v) for the payment of principal, redemption premium, if any, and interest on other general obligation debt issued in respect of the System; (vi) for the payment of amounts due under capitalized leases or similar obligations relating to the System; and (vii) to fund a transfer to the City's "General Fund" in an amount not to exceed the lower of (A) all "Net Reserve Fund Earnings," as defined below, or (B) $4,994,000. "Net Reserve Fund Earnings" shall mean the amount of interest earnings during the Fiscal Year on amounts in any reserve funds established pursuant to Supplemental Ordinances and in any reserve accounts established within the Sinking Fund and the Subordinated Bond Fund less the amount of interest earnings during the Fiscal Year on amounts in any such reserve funds and accounts giving rise to a rebate obligation pursuant to Section 148(f) of the Code.

Rate Stabilization Fund

As of the effective date of the 1989 General Ordinance and as of June 30 of each Fiscal Year, the City shall transfer from the Rate Stabilization Fund to the Revenue Account the amount determined by the Water Commissioner to be deposited into Revenue Account for such Fiscal Year.

Construction Fund

Proceeds of Bonds issued for capital purposes shall be deposited into the Bond Proceeds Account of the Construction Fund and disbursed according to established procedures of the City.

Rebate Fund

The Rebate Fund shall be maintained for so long as any Series of Bonds is outstanding, and for sixty (60) days thereafter (or such other period as may be specified by the Code and applicable regulations), for the purpose of paying to the United States Treasury the amount required to be rebated pursuant to Section 148(f) of the Code. All amounts in the Rebate Fund, including income earned from investment of amounts in the Rebate Fund, shall be held by the City free and clear of the lien created by the 1989 General Ordinance.

Management and Investment of Funds and Accounts

The moneys on deposit in the funds and accounts established under the 1989 General Ordinance, to the extent not currently required, shall be invested and secured as required by Section 9 of the Act, all at the direction and under the management of the Director of Finance or such other chief fiscal officer of the City as may hereinafter be established.

Interest earnings on amounts on deposit (i) in the Revenue Account shall be credited to the Revenue Account; (ii) in the Sinking Fund shall be credited to the Sinking Fund to the extent needed to meet Debt Service Requirements in respect of Bonds (other than Subordinated Bonds) and additional interest earnings shall be credited to the Revenue Account; (iii) in any reserve fund or reserve account of the Sinking Fund shall be credited to the reserve fund or account until such fund or account is fully funded and shall then be credited to the General Account up to the maximum amount to be transferred to the City's General Fund and shall then be transferred to the Revenue Account; (iv) in the Subordinated Bond Fund shall be credited to the Subordinated Bond Fund to the extent not needed to meet Debt Service Requirements in respect of Subordinated Bonds and additional interest earnings shall be credited to the Revenue Account or to such other fund or account established under the 1989 General Ordinance, as the City may direct pursuant to a Supplemental Ordinance; (v) in the Capital Account shall be credited to the Revenue Account; (vi) in the General Account shall be credited to the General Account or the Revenue Account, as the City shall direct; (vii) in the Rate Stabilization Fund shall be credited to the Revenue Account; (viii) in the Construction Fund shall be credited to the appropriate account of the Construction Fund or to the Revenue Account, as the City shall direct; and (ix) in the Rebate Fund shall be credited to the Rebate Fund.

Rate Covenant

The City covenants with the Holders of all Bonds outstanding under the 1989 General Ordinance that so long as any such Bonds shall remain outstanding it will, at a minimum, impose, charge and collect in each Fiscal Year such water and wastewater rents, rates, fees and charges as shall yield Net Revenues which shall be equal to at least 1.20 times the Debt Service Requirements for such Fiscal Year (recalculated to exclude therefrom principal and interest payments in respect of Subordinated Bonds); provided that such water and wastewater rents, rates, fees and charges shall yield Net Revenues which shall be at least equal to 1.00 times (i) the Debt Service Requirements for such Fiscal Year (including Debt Service Requirements in respect of Subordinated Bonds); (ii) the principal or redemption price of and interest on General Obligation Bonds payable during such Fiscal year; (iii) principal and interest on bond anticipation notes outstanding as of the date of enactment of the 1989 General Ordinance payable during such Fiscal Year (to the extent not capitalized); (iv) debt service requirements on Interim Debt payable during such Fiscal Year; and (v) the Capital Account Deposit Amount for such Fiscal Year (less any amounts transferred from the General Account to the Capital Account during such Fiscal Year).

Conditions of and Provisions Relating to Issuing Bonds

The City covenants with the Holders of all Bonds outstanding under the 1989 General Ordinance that so long as any such Bonds shall remain outstanding it will not issue any Series of Bonds under the 1989 General Ordinance without first complying with the conditions set forth in the subparagraphs (a) through (d) below and further covenants to comply with certain provisions relating to execution of documents, disposition of proceeds, issuance of refunding bonds and Subordinated Bonds;

(a) the City shall enact a Supplemental Ordinance specifying the aggregate principal amount and authorizing the issuance of such Bonds; stating that such Bonds are issued for a purpose authorized by the Act; making a finding based on the report of the Director of Finance required by Section 8 of the Act; and containing the covenant as to the payment of debt service required by Article IX, Section 10 of the Pennsylvania Constitution.

(b) The Director of Finance shall, in addition to the filing requirements of Section 12 of the Act, file with the Fiscal Agent a transcript of the proceedings authorizing the issuance of such Series of Bonds which shall include (i) a certified copy of the 1989 General Ordinance (unless previously so filed); (ii) a certified copy of the Supplemental Ordinance and the Determination specifying terms of the Series of Bonds; (iii) an executed or certified copy of the report of the Director of Finance required by Section 8 of the Act; (iv) an executed copy of the opinion of the City Solicitor required by Section 8 of the Act; (v) an executed or certified copy of the Consulting Engineer's report required by subparagraph (c) of this Section; (vi) if the Series of Bonds has been structured so that interest on such Bonds will not be excluded from the gross income of the Holders thereof for the purpose of calculating federal income tax (not taking into account collateral tax consequences associated with the holding of tax exempt bonds)

an opinion of Bond Counsel to the effect that issuance of such Series of Bonds will not adversely affect the exemption from federal income tax of interest on other Series of Bonds; (vii) a certificate of the Director of Finance that there is no default in the payment of the principal of, interest on, or premiums, if any, payable in respect of, any Bonds; that the report for the latest completed Fiscal Year required to be filed has been filed; that during such Fiscal Year the City was in compliance with the Rate Covenant; and that the City is currently in compliance with the Rate Covenant and all other covenants contained in the 1989 General Ordinance and all Supplemental Ordinances; and (viii) the opinions required by subparagraph (d) of this Section.

(c) Concurrently with the delivery to City Council of the financial report and opinion required by Section 8 of the Act as a condition to enactment of a Supplemental Ordinance authorizing a Series of Bonds, there shall be delivered to City Council a report of a Consulting Engineer setting forth the qualifications of the Consulting Engineer and containing:

(i) a statement, supported by appropriate schedules and summaries, that, on the basis of actual, if appropriate, and estimated future annual financial operations of the Project or Projects from which pledged Project Revenues are to be derived, the Project or Projects will, in the opinion of the Consulting Engineer, yield pledged Project Revenues over the amortization period of the Bonds to be issued therefor, sufficient to meet the payment or deposit requirements of (A) all expenses of operation, maintenance, repair and replacement of the Project, (B) all reserve funds required to be established out of such Project Revenues, (C) the principal or redemption price of and interest on Bonds, as the same become due and payable, for which such Project Revenues are pledged and (D) any state taxes assumed by the City to be paid on Bonds; (ii) a statement, supported by appropriate schedules and summaries, that the Net Revenues, on the basis of which the statements required by the foregoing clause (i) are made, are currently sufficient to comply with the Rate Covenant and are projected to be sufficient to comply with the Rate Covenant for each of the two Fiscal Years following the Fiscal Year in which the Bonds are issued; provided that if interest on the Bonds or a portion thereof has been capitalized, the projection shall extend to the two Fiscal Years following the Fiscal Year up to which interest has been capitalized on the Bonds or a portion thereof; and (iii) a statement that, in the opinion of the Consulting Engineer, the System is in good operating condition or that adequate steps are being taken to return it to good operating condition.

(d) The City shall cause to be filed with the Fiscal Agent (i) an opinion of Bond Counsel to the effect that (1) the Bonds have been duly issued for a permitted purpose under the Act and the 1989 General Ordinance and (2) all conditions precedent to the issuance of the Bonds pursuant to the Act and the 1989 General Ordinance have been satisfied and (ii) an opinion of the City Solicitor to the effect that all documents delivered by the City in connection with the issuance of the Bonds have been duly and validly authorized, executed and delivered and such execution and delivery and all other actions taken by the City in connection with the issuance of the Bonds have been duly authorized by all necessary actions of City Council.

Disposition of Insurance Proceeds and Proceeds from the Sale of Assets

In the event that any assets of the System are destroyed or the City shall sell any assets of the System, the City shall, if the insurance proceeds or the proceeds from the sale of assets exceed 1.5% of the depreciated value of property, plant and equipment of the System, as shown on the financial statements of the City for the preceding Fiscal Year, apply such amounts, at the direction of the Director of Finance or such other chief fiscal officer of the City as may hereinafter be established (i) to the retirement of the principal amount of debt incurred in respect of the System; (ii) to the reconstruction, repair or replacement of assets of the System; or (iii) to the making of capital additions or improvements to the System.

Fiscal Agent

The Fiscal Agent under the 1974 General Ordinance or its successor, shall be Fiscal Agent as of the effective date of the 1989 General Ordinance. The City may appoint a successor Fiscal Agent by Supplemental Ordinance to act as Fiscal Agent under the 1989 General Ordinance, and in connection with the Bonds issued under the 1989 General Ordinance. The Fiscal Agent shall also act as depository of the Sinking Fund and the Subordinated Bond Fund, and may act as paying agent and Bond Registrar.

Nothing in the 1989 General Ordinance shall be construed to prevent the City, in accordance with law, from engaging other Fiscal Agents from time to time or to engage other paying agents of the Bonds or any Series thereof in addition to, or as a successor to the Fiscal Agent. Any entity appointed by the City as Fiscal Agent under the 1989 General Ordinance shall be a trust company or national or state bank having trust powers and combined capital and surplus of at least $50,000,000 and be qualified to serve pursuant to the Act. Any entity appointed by the City as Fiscal Agent under the 1989 General Ordinance as a successor to the Fiscal Agent shall assume all rights and obligations of the Fiscal Agent.

Resignation of Fiscal Agent and Appointment of Successor

The Fiscal Agent may resign and be discharged of the duties created by the 1989 General Ordinance by written resignation filed with the Director of Finance not less than sixty days before the date when such resignation is to take effect. Such resignation shall take effect on the day specified in such notice provided that a successor Fiscal Agent is appointed. If a successor Fiscal Agent is appointed prior to the date specified in the notice, the resignation shall take effect immediately on the appointment of such successor, and the City shall give the notices as hereinafter described.

If the Fiscal Agent or any successor Fiscal Agent resigns or is dissolved or if its property or business is taken under the control of any state or federal court or administrative body, a vacancy shall exist in the office of the Fiscal Agent, and the City shall appoint a successor within thirty (30) days of such vacancy and shall mail notice of such appointment to the Bondholders and to the registered depositories at their registered addresses by first class mail, postage prepaid, within thirty (30) days of such appointment.

Defaults and Statutory Remedies

If the City shall fail or neglect to pay or to cause to be paid the principal of, redemption premium, if any, or interest on any Bond or any Series of Bonds issued under the 1989 General Ordinance, whether at stated maturity or upon call for prior redemption, or if the City shall fail to comply with any provision of any Bonds or with any covenant of the City contained in the 1989 General Ordinance, then, under and subject to the terms and conditions stated in the Act, the Holder or Holders of any Bond or Bonds shall be entitled to all of the rights and remedies, including the appointment of a trustee, provided in the Act; provided, however, that the remedy provided in Section 20(b)(4) of the Act may be exercised only upon the failure of the City to pay principal (including principal due as a result of a scheduled mandatory redemption) and interest on a Series of Bonds.

Any decree or judgment for the payment of money against the City by reason of default under the 1989 General Ordinance shall be enforceable only against the Project Revenues and the investments thereof and amounts on deposit in the funds and accounts (other than the Rebate Fund) established under the 1989 General Ordinance, and no decree or judgment against the City upon an action brought under the 1989 General Ordinance shall order or be construed to permit the occupation, attachment, seizure, or sale upon execution of any other property of the City.

Conveyance and Assignment, Assumption and Release

Nothing in the 1989 General Ordinance shall prevent the City from conveying and assigning to a municipal authority created pursuant to the Municipality Authorities Act of 1945, as amended, or an authority created pursuant to any other applicable statute or to another entity (the "Authority") all or substantially all (or less than substantially all, as provided below) of its right, title and interest in the System and thereupon becoming released from all of its obligations under the 1989 General Ordinance, under any Supplemental Ordinance and under the Bonds (i) if the Authority assumes in writing the City's obligations (1) to operate or cause the System to be operated and to maintain or cause the System to be maintained in good condition; and (2) to pay the principal, redemption premium, if any, and interest on all Bonds issued pursuant to the 1989 General Ordinance and then outstanding according to the terms thereof; and (ii) if the instrument of assumption provides the Bondholders or the trustee or entity serving in a similar capacity and acting on behalf of the Bondholders with substantially all of the rights and remedies provided in this Ordinance and the Act; provided, however, that before the City may consummate such a conveyance and assignment and obtain a release of its obligations under the 1989 General Ordinance, under any Supplemental Ordinance and under the Bonds, the following conditions shall have been satisfied:

(a) the City and the Fiscal Agent shall have received opinions of the City Solicitor, counsel to the Authority, and Bond Counsel regarding certain matters as provided in the 1989 General Ordinance;

(b) the Authority shall, concurrently with the conveyance, assignment, assumption and release described above, grant to the trustee or entity serving in a similar capacity and acting on behalf of Bondholders a security interest in the revenues to be generated by the System following the conveyance, assignment, assumption and release equal to the security interest granted in Project Revenues;

(c) the City and the Fiscal Agent shall have received a report of a Consulting Engineer and a verification of such report by a second Consulting Engineer, concluding that for each of the three 12 month periods following the conveyance, assignment, assumption and release described above or for each of the three fiscal years of the Authority commencing with the first full fiscal year of the Authority following the conveyance, assignment, assumption and release described above, the System is projected to generate revenues in an amount which, after subtracting projected operating expenses (determined in accordance with generally accepted accounting principles and attributable to the System) will be equal to at least 1.00 times the Debt Service Requirements (as defined in subparagraph (f) and at least 1.20 times the Debt Service Requirements (as defined in subparagraph (f) but calculated to exclude Debt Service Requirements in respect of Subordinated Bonds and General Obligation Bonds which continue to be outstanding after such transfer) for each of said 12 month periods or fiscal years, as the case may be;

(d) the Authority shall have the authority to establish and shall have established and shall have agreed to maintain rates and charges in connection with the operation of the System at a level sufficient, in the opinion of a Consulting Engineer, as verified by the report of a second Consulting Engineer; as contained in a report filed with the Fiscal Agent, to generate revenues in each fiscal year of the Authority in an amount which, after subtracting all operating expenses (determined in accordance with generally accepted accounting principles and attributable to the System) during such fiscal year, will be equal to at least 1.00 times the Debt Service Requirements (as defined in subparagraph (f) and debt service requirements on Interim Debt, and at least 1.20 times the Debt Service Requirements (as defined in subparagraph (f) but calculated to exclude Debt Service Requirements in respect of Subordinated Bonds and General Obligation Bonds which continue to be outstanding after such transfer) for the next succeeding fiscal year of the Authority;

(e) the Authority shall have agreed to maintain rates and charges in connection with the operation of the System at a level sufficient to generate revenues in each fiscal year of the Authority in an amount which, after subtracting all operating expenses (determined in accordance with generally accepted accounting principles and attributable to the System) during such fiscal year will be equal to at least 1.00 times the Debt Service Requirements (as defined in subparagraph (f) and at least 1.20 times the Debt Service Requirements (as defined in subparagraph (f) but calculated to exclude Debt Service Requirements in respect of Subordinated Bonds) for such fiscal year;

(f) the Authority shall have agreed to incur no debt payable from revenues of the System following the conveyance, assignment, assumption and release unless it shall first have obtained a report of a Consulting Engineer, as verified by the report of a second Consulting Engineer, concluding that for each of the first two fiscal years of the Authority following the fiscal year in which the debt in question is to be incurred (or, if interest on all or a portion of the proposed debt is to be capitalized, following the Fiscal Year up to which interest has been capitalized on the debt or a portion thereof) the revenues of the Authority to be available for Debt Service Requirements (as defined below) (after subtracting therefrom all operating costs of the Authority which will reduce the availability of said revenues for Debt Service Requirements) will be equal to at least 1.00 times the Debt Service Requirements (as defined below) for such Fiscal Years and at least 1.20 times the Debt Service Requirements (as defined below but calculated to exclude Debt Service Requirements in respect of Subordinated Bonds and General Obligation Bonds which continue to be outstanding after such transfer) for such Fiscal Years. For purposes of the foregoing sentence and subparagraphs (c), (d) and (e), the phrase "Debt Service Requirements" shall have the meaning assigned to it in the section entitled "Definition of Terms Used Herein" with the exception that references to Bonds shall be deemed to include references to General Obligation Bonds which continue to be outstanding after such transfer, additional debt of the Authority payable from revenues of the System and the debt, if any, which the Authority proposes to incur;

(i) the Authority shall have agreed to incur no debt secured by a pledge of revenues of the System senior to the pledge of said revenues securing the Bonds (including Subordinated Bonds);

(j) the Authority shall have (i) deposited with the City or an agent acting on behalf of the City cash or securities of the types specified in Section 10 of the Act maturing as to the principal and premium, if any, and interest in such amounts and at such times as will insure, without consideration of any reinvestment thereof, the availability of cash sufficient to pay the principal or redemption price of General Obligation Bonds outstanding on the date of the conveyance at maturity or at a specified call date together with interest to accrue thereon to maturity or the call date or (ii) entered into an agreement with the City pursuant to which the Authority shall have agreed to make payments to the City at such times and in such amounts as will enable the City to pay the principal or redemption price of General Obligation Bonds outstanding on the date of the conveyance at maturity or at a specified call date together with interest to accrue thereon when due and payable to maturity or the call date.

The Authority shall, upon conveyance and assignment to it of the City's right, title and interest in the System, administer, finance and operate the System and, in consideration of such conveyance and transfer, may finance and pay the City compensation in amount agreed upon between the City and Authority representing the City's equity interest in the System after a fair value for such equity interest has been appropriately established by the parties.

Notwithstanding the foregoing, the City may convey to the Authority less than substantially all of its right, title and interest in the System if a Consulting Engineer shall first have certified that the assets of the System which the City proposes to exclude from the conveyance to the Authority are not material to the ability of the System to generate revenues following the conveyance.

Anything in the 1989 General Ordinance to the contrary notwithstanding, upon a conveyance of all or substantially all of the assets of the System to the Authority pursuant to this Article IX, the provisions of the 1989 General Ordinance shall no longer be enforceable against the City.

Amendments and Modifications

In addition to the enactment of Supplemental Ordinances supplementing or amending the 1989 General Ordinance in connection with the issuance of successive Series of Bonds, the 1989 General Ordinance and any Supplemental Ordinance may be further supplemented, modified or amended: (a) to cure any ambiguity, formal defect or omission in the 1989 General Ordinance or in the Supplemental Ordinance or to make such provisions in regard to matters or questions arising under the 1989 General Ordinance or under the Supplemental Ordinance which shall not be inconsistent with the provisions of the 1989 General Ordinance or of the Supplemental Ordinance and which shall not adversely affect the interests of Bondholders; (b) to grant to or confer upon Bondholders, or a trustee, if any, for the benefit of Bondholders any additional rights, remedies, powers, authority, or security that may be lawfully granted or conferred; (c) to provide for the establishment of a reserve or similar fund to be held for the benefit of one or more Series of Bonds; (d) to incorporate modifications requested by any Rating Agency to obtain a credit rating on any Series of Bonds; (e) to comply with any mandatory provision of state or federal law or with any permissive provision of such law or regulation which does not substantially impair the security or right to payment of the Bonds but no amendment or modification shall be made with respect to any outstanding Bonds to alter the amount, rate or time of payment, respectively, of the principal thereof or the interest thereon or to alter the redemption provisions thereof without the written consent of the Holders of all affected outstanding Bonds; and (f) except as aforesaid, in such other respect as may be authorized in writing by the Holders of 67% in principal amount of the Bonds outstanding and affected. If a letter of credit issuer, municipal bond insurance provider or any other person undertakes to provide moneys for the account of the City for the payment of principal or redemption price of and interest on any Series of Bonds or portion of any Series of Bonds, such provider shall be the representative of the Bondholders of such Series or portion of such Series for purposes of Bondholder consent, approval or authorization.

Deposit of Funds for Payment of Bonds

When interest on, and principal or redemption price (as the case may be) of, all Bonds issued under the 1989 General Ordinance have been paid, or there shall have been deposited with the Fiscal Agent or an entity which would qualify as a Fiscal Agent under the 1989 General Ordinance an amount, evidenced by

moneys or Qualified Escrow Securities the principal of and interest on which, when due, will provide sufficient moneys to fully pay the Bonds at the maturity date or date fixed for redemption thereof, the pledge and grant of a security interest in the Project Revenues made under the 1989 General Ordinance shall cease and terminate, and the Fiscal Agent and any other depository of funds and accounts established under the 1989 General Ordinance shall turn over to the City or to such person, body or authority as may be entitled to receive the same all balances remaining in any funds and accounts established under the 1989 General Ordinance.

If the City deposits with the Fiscal Agent or such other qualified entity moneys or Qualified Escrow Securities sufficient to pay the principal or redemption price of any particular Bond or Bonds becoming due, either at maturity or by call for redemption or otherwise, together with all interest accruing thereon to the due date, interest on the Bond or Bonds shall cease to accrue on the due date and all liability of the City with respect to such Bond or Bonds shall likewise cease. Thereafter such Bond or Bonds shall be deemed not to be outstanding under the 1989 General Ordinance and the Holder or Holders of such Bond or Bonds shall be restricted exclusively to the funds so deposited for any claim of whatsoever nature with respect to such Bond or Bonds, and the Fiscal Agent or such other qualified entity shall hold such funds in trust for such Holder or Holders.

APPENDIX P

GENERAL CORRESPONDENCE

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CITY OF PHILADELPHIA

PHILADELPHIA CITY PLANNING COMMISSION
17th Floor, 1515 Market Street
Philadelphia, Pa. 19102
215.686.4607
215.564.0672 (FAX)

Robert Vance, Esq.,CHAIRMAN

Barbara J. Kaplan, EXECUTIVE DIRECTOR
David A. Baldinger, DEPUTY DIRECTOR

March 31, 1993

Commissioner Kumar Kishinchand
Water Department
1101 Market Street
Philadelphia, PA 19107

RE: City of Philadelphia Official Sewage Facilities Plan
(PA. Act 537 Plan)

Dear Commissioner Kishinchand:

This letter is in response to your request to review the above-captioned Plan in accord with the requirements of Pennsylvania Act 537. The staff of the Philadelphia City Planning Commission has completed its review and has found the Plan to be consistent with the overall Comprehensive Plan for the City of Philadelphia.

Therefore, the staff of the City Planning Commission hereby recommends that the proposed City of Philadelphia Official Sewage Facilities Plan (PA. Act 537 Plan) be submitted to City Council for approval.

Sincerely yours,

Barbara J. Kaplan

Barbara J. Kaplan
Executive Director

CITY OF PHILADELPHIA
DEPARTMENT OF PUBLIC HEALTH
OFFICE OF THE COMMISSIONER

May 19, 1993

MEMORANDUM

TO : Kumar Kishinchand, Commissioner
Philadelphia Water Department

FROM : Robert K. Ross, M.D.
Commissioner

SUBJECT : SEWAGE FACILITIES (ACT 537) PLAN FOR PHILADELPHIA COUNTY

This is in response to your memorandum of March 8, 1993 requesting Health Department review of the City of Philadelphia Sewage Facilities Plan.

The revised Plan received on May 14, 1993 was reviewed and found to be consistent with the plans and programs of the Philadelphia Department of Public Health. Therefore, this plan is approved.

If I can be of further assistance, kindly let me know.

RKR/ds

Memphis, Tenn.	80/59/pc	75/55/t
Miami	85/53/s	84/71/s
Minneapolis	50/28/pc	44/34/sn
New Orleans	80/55/pc	81/64/t
New York	59/41/s	66/44/s
Orlando	87/56/s	88/66/s
Phoenix	78/57/pc	82/56/s
Portland, Maine	55/42/r	54/35/s
St. Louis	56/46/t	64/46/t
Salt Lake City	52/33/pc	59/38/pc
San Diego	76/56/s	71/56/s
San Francisco	61/48/pc	65/52/pc
Seattle	53/42/r	58/46/c
Tampa, Fla	80/55/s	87/68/s
Washington	64/41/s	64/52/pc

CITIES ABROAD

	YESTERDAY	TODAY
Acapulco	88/72/s	88/72/s
Amsterdam	56/44/c	56/44/sh
Athens	70/53/s	77/50/s
Auckland	68/54/pc	68/50/pc
Bangkok	94/72/t	96/72/pc
Barbados	87/75/pc	87/73/pc
Beijing	66/44/s	58/48/pc
Beirut	68/52/s	72/52/s
Berlin	50/31/pc	50/37/c
Bermuda	72/63/sh	72/63/pc
Bogota	65/50/pc	62/48/c
Brussels	57/48/c	55/48/sh
Buenos Aires	82/68/pc	79/61/sh
Cairo	84/52/s	82/54/s
Copenhagen	50/36/s	52/36/pc
Curacao	88/78/pc	88/76/pc
Dublin	53/45/sh	53/45/sh
Freeport	80/65/s	83/65/s
Geneva	58/42/sh	56/48/sh
Havana	86/62/pc	86/64/pc
Hong Kong	74/62/pc	76/62/pc
Jerusalem	70/46/s	72/48/s
Johannesburg	64/52/pc	66/54/c
Kingston	88/75/pc	88/75/pc
London	50/43/sh	56/45/c
Madrid	58/46/r	59/46/sh
Manila	90/77/sh	91/77/pc
Melbourne	72/59/sh	68/55/pc
Mexico City	82/54/s	82/54/pc
Milan	58/45/sh	56/45/c
Montego Bay	88/75/pc	88/75/pc
Montreal	48/37/c	48/32/s
Moscow	38/32/c	38/32/sf
Nairobi	75/57/pc	75/55/pc
Nassau	82/62/s	84/64/s
New Delhi	94/68/s	94/66/s
Nice	58/49/sh	60/49/c
Oslo	49/29/s	51/31/s
Paris	53/42/sh	55/45/sh
Perth	78/56/s	80/54/s
Rio de Janeiro	84/75/pc	84/70/pc
Rome	64/52/sh	66/55/sh
San Juan	83/73/pc	88/75/pc
Seoul	58/42/pc	58/42/pc
Stockholm	46/25/s	49/29/s
Sydney	76/59/s	78/58/pc
Taipei	73/58/sh	78/56/pc
Tokyo	52/43/r	64/45/pc
Toronto	55/30/s	54/39/pc
Trinidad	87/75/pc	87/73/pc

Letter indications: s, sunny; pc, partly cloudy; c, cloudy; sh, showers; t, thunderstorms; r, rain; sf, snow flurries; sn, snow; i, ice.

Streets that is still the home of the one-room library.

Valuable or not, the leather-bound and somewhat weather-beaten volumes, printed with the old English type that uses an *f* in place of an *s*, are a book-lover's delight.

Among the titles are: *The Gentleman Instructed*, 1738; *The Turkish Spy*, 1741; Puffendorf's *The Compleat History of Sweden*, 1702; *The Independent Whig*, 1735; Locke's *Some Thoughts Concerning Education*; Milton's *Paradise Lost and Paradise Re-*

Naomi Valutas, vice president of the library board, said the theory is that either Miss Engles or someone else came across the book while cleaning out a house.

"Or maybe," Valutas said, "she was just an honest person who found it on the street and just sent it back without seeking any reward. Whatever, we're glad to have it. And, you know, this was considered pretty risque reading in those days."

Today, Darby Library has 20,000 books and serves 5,000 patrons. Al-

Phila. man suspect in Bloomsburg rapes

BLOOMSBURG from B1

burglaries beginning in 1991, the intruder routinely rigged a rear window, enabling him to return later to commit a sexual attack, Shovlin said.

Meanwhile, DNA testing showed that the four rapes were committed by the same individual. Records at the Columbia County Probation Office showed that Lindsey, on probation for three 1991 burglaries, had the same blood type as the rapist.

There were three more burglaries in January and March of this year. And one of the victims, a female university student, surprised the intruder, who matched Lindsey's description, in her living room on Jan. 12.

The burglar escaped with several of her belongings, and police say several of the stolen items were found during a search of Lindsey's apartment Saturday.

Items taken in another recent burglary also were found in Lindsey's apartment, police said.

All that led undercover troopers to Lindsey. They began tailing him April 6, Shovlin said, and kept him under surveillance through Saturday.

They watched as he cased one of the apartments that had been recently burglarized, and a sting was set up with the female state troopers inside the home.

About 4 a.m., Lindsey entered the apartment through a back window, Shovlin said, brandishing a steak knife.

"He got the surprise of his life when two female troopers were there waiting for him," Shovlin said. "As soon as they pulled their firearms out and identified themselves, he jumped out the window."

Eight officers were waiting outside, Shovlin said, and they caught him.

Lindsey attended classes in the summer of 1990. He was accepted for the spring 1991 term, but dropped out before completing the semester, a university spokesman said.

Michael Boykin, the husband of the university's police chief, was charged in the alleged rape of a coworker in December 1992. Authorities investigated whether Boykin could be linked to the serial rapes, but said DNA tests ruled him out.

The Associated Press contributed to this article.

(A)

Suburban wholesale
w/o last line, paragraph 2

April 8, 1993

∇

Dear ∇:

The Philadelphia Water Department has recently completed a draft sewage facilities plan for Philadelphia County as required by the Pennsylvania Sewage Facilities Act, commonly known as Act 537. The Plan is intended to meet Act 537's mandate for consistent and appropriate planning for wastewater treatment capacity in order to identify current and future needs, protect natural resources, and protect public health.

The state Department of Environmental Resources (DER) has requested that the Water Department inform affected parties of the availability of the draft 537 Plan, including any political subdivisions served under wholesale agreements with the Philadelphia Water Department. Because ∇ is served under our contractual agreement with ∇, I am hereby notifying you of the availability of the Plan and requesting your comment, if any, within 30 days of the date of this letter.

Because your sewage planning needs are addressed in detail by your county's 537 Plan and our draft is largely concerned with planning for future sewage requirements within Philadelphia, only limited sections may be of concern to ∇. Accordingly, I have attached selected pages of the report which include material of interest to wholesale customers. A copy of the full draft 537 Plan is available for your inspection at the Philadelphia Water Department's Library, 3rd Floor, ARA Tower, 1101 Market Street, Philadelphia, PA 19107, from 8:30 a.m. through 4:30 p.m. on normal business days. In addition, a copy is on reserve at the main branch of the Philadelphia Free Library, 1900 Vine Street, Philadelphia, PA 19103, on Mondays through Wednesdays from 9:00 a.m. to 9:00 p.m., on Thursdays and Fridays from 9:00 a.m. to 6:00 p.m., on Saturdays from 9:00 a.m. to 5:00 p.m. and on Sundays from 1:00 p.m. to 5:00 p.m.

(B)

April 8, 1993

∇

Bucks-Montgomery Water Co.

Dear ∇:

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The state Department of Environmental Resources (DER) has requested that the Water Department inform affected parties of the availability of the draft 537 Plan, including wholesale customers and any political subdivisions served under wholesale wastewater agreements with the Philadelphia Water Department. Because of our contractual agreements with ∇, I am hereby notifying you of the availability of the Plan and requesting your comment, if any, within 30 days of the date of this letter. As required by the DER, similar letters are being sent to the political subdivisions you serve, including ∇.

Because your sewage planning needs are addressed in detail by your county's 537 Plan and our draft is largely concerned with planning for future sewage requirements within Philadelphia, only limited sections may be of concern to ∇. Accordingly, I have attached selected pages of the report which include material of interest to wholesale customers. A copy of the full draft 537 Plan is available for your inspection at the Philadelphia Water Department's Library, 3rd Floor, ARA Tower, 1101 Market Street, Philadelphia, PA 19107, from 8:30 a.m. through 4:30 p.m. on normal business days. In addition, a copy is on reserve at the main branch of the Philadelphia Free Library, 1900 Vine Street, Philadelphia, PA 19103, on Mondays through Wednesdays from 9:00 a.m. to 9:00 p.m., on Thursdays and Fridays from 9:00 a.m. to 6:00 p.m., on Saturdays from 9:00 a.m. to 5:00 p.m. and on Sundays from 1:00 p.m. to 5:00 p.m.

(C)

April 8, 1993

Boroughs & townships

∇

Dear ∇:

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Received Letter A:

Bensalem Township

Lower Southampton Municipal Authority

Lower Moreland Township

Upper Darby Township

Received Letter B:

Abington Township

Bucks County Water & Sewer Authority

Cheltenham Township

Received Letter C:

Borough of Rockledge

Bensalem Township
Bristol Township
Falls Township
Hulmeville Borough
Langhorne Borough
Lower Makefield Township
Lower Southampton Township
Middletown Township
Newtown Borough
Newtown Township
Northampton Township
Penndel Borough

Abington Township
Jenkintown Borough

Received Letter B (cont'd):	Received Letter C (cont'd):
DELCORA	Norwood Borough Glenolden Borough Swarthmore Borough Haverford Township Radnor Township Newtown Township Morton Borough Rutledge Borough Prospect Park Borough Ridley Park Borough Darby Township Upper Darby Township Ridley Township Springfield Township Marple Township Nether Providence Township Upper Providence Township Tinicum Eddystone Borough Folcroft Borough
Lower Merion Township	Radnor Township Haverford Township Borough of Narberth
Springfield Township	Cheltenham Township Upper Dublin Township Whitemarsh Township

Ref. File: BT-1

UNITECH ENGINEERS, INC.

Consulting Engineers & Surveyors

PENNA. OFFICE
654 N. WOODBOURNE ROAD
LANGHORNE, PA 19047
(215) 752-2240
FAX (215) 752-4745

April 27, 1993

Mr. Dean Kaplan, Deputy Commissioner
City of Philadelphia
Water Department
ARA Tower at Reading Center
1101 Market Street
Philadelphia, PA 19107-2994

Reference: Draft Sewage Facilities Plan
(Act 537 Plan) for Philadelphia, County

Dear Mr. Kaplan:

Reference is made to your letter dated April 8, 1993, to Mr. Joseph Szafranski, Chairman, Bristol Township Authority, Bristol Township, Bucks County, PA pertaining to the above referenced subject. On behalf of the Authority, we reviewed your attached selected pages of the Draft Sewage Facilities Plan. Based on our review, we have one comment/clarification to make regarding a statement in the second paragraph of Section 3.2.3, Page 3-43. This statement says that "For Planning Purposes, the short-term agreements are assumed to continue since there is no indication that any of the municipalities/authorities are considering alternative treatment and disposal systems." In this regard it should be noted that during December, 1989, Bristol Township adopted the Sewage Facilities Plan (Act 537 Plan) prepared by Unitech Engineers, Inc. by resolution. A sewer service area of the Bristol Township Authority was the base sewage facilities planning area. The Plan has been reviewed by the Bucks County Planning Commission and the Bucks County Health Department. The Plan has not yet been formerly approved by the PA DER.

The recommended wastewater management alternative of the Bristol Township Act 537 Plan is a diversion of wastewater flows from the subdistricts 3 and 4 and Keystone Industrial District of the Bristol Township Authority's sewer service area to the Bristol Township wastewater treatment plant. In order to accommodate the proposed diversion, a rerating of the plant from 2.25 MGD to 3.0 MGD has been recommended. Presently, wastewater generated in these districts is conveyed to the City of Philadelphia's Northeast Wastewater Treatment Plant by the Neshaminy Interceptor of the Bucks County Water and Sewer Authority. A copy of the executive summary of the Township's

Act 537 Plan is attached for your information. Reference to this Plan can also be found on Page 11 (under the section titled Wastewater Facilities Plan) of Bucks County Wastewater Facilities Plan Volume II - Analysis and Recommendations - Falls Area, prepared by the Bucks County Planning Commission, January, 1991 (please refer to enclosed pages 9 thru 11 of the Bucks County Wastewater Facilities Plan).

If you should have any questions or need any additional information, please do not hesitate to call us.

Very truly yours,

UNITECH ENGINEERS, INC.

S.J. Campbell, P.E.

SJC/VSR/mg
Enclosures:
cc: Joseph Szafranski, Chairman, BTA

TOWNSHIP OF LOWER MERION
MONTGOMERY COUNTY

TOWNSHIP ENGINEER

75 E. Lancaster Ave.
Ardmore, Pa. 19003
Telephone: (215) 649-4000

0800-204.29(139) May 4, 1993

Mr. Dean Kaplan, Deputy Commissioner
City of Philadelphia Water Department
ARA Tower at Reading Center
1101 Market Street
Philadelphia, PA 19107-2994

Re: 537 Sewage Facilities Plan - Your letter dated April 8, 1993

Dear Mr. Kaplan:

Thank you for the opportunity to review your 537 Plan and for sending us copies of the pages that directly pertain to the Lower Merion Township.

We offer the following comments:

- Since Lower Merion Township collects sewage from Narberth Borough, we expect that they received your notice although you didn't mention them in your letter to us.

- The Lower Merion Township's Board of Commissioners officially adopted a Revised 537 Plan on February 17, 1993. Extensive sewage facilities details are now updated and available for your use. The PaDER is performing their engineering review and we expect a final acceptance of our revised 537 Plan by mid-summer.

- Page 5-13 contains a comment that the demand for contracted sewage flows will dampen with a projected population decrease in Lower Merion Township. Actually, our township has a vigorous planned 10 year program to install public sewers in much of the previously unsewered area as described in the Revised 537 Plan. The new demand placed on the public sewerage system will most likely surpass the effects of any projected population decreases.

- Table 3.2.1 shows a contributing area for Lower Merion Township to be 12,100 acres. If these figures represent drainage areas, then Lower Merion Township may be understated. The area of Lower Merion Township is about 23.64 square miles. Additionally, parts of Haverford, Radnor and Narberth contribute. If the table is referring to the sewered areas only, then the stated average is a reasonable figure for Lower Merion Township, but parts of Haverford, Radnor and Narberth should be considered as additional areas.

If you have any questions please call me at (215) 561-0460.

Very truly yours,

Robert E. Norman, P.E.
PENNONI ASSOCIATES
Township Engineer

REN:dk
cc: David C. Latshaw, Township Manager

5/7

Newtown, Bucks County, Joint Municipal Authority

P.O. Box 329 — 15 South Congress Street
Newtown, Pennsylvania 18940
Newtown Borough (215) 968-4109 Newtown Township

May 5, 1993

Dean Kaplan, Deputy Commissioner
City of Philadelphia Water Department
ARA Tower at Reading Center
1101 Market Street
Philadelphia, PA 19107-2994

Dear Mr. Kaplan:

RE: Philadelphia Act 537 Plan

In response to your April 8, 1993 letter, the Newtown, Bucks County, Joint Municipal Authority has reviewed the sections you transmitted from the draft Act 537 Plan for Philadelphia. Attached is a copy of a letter from our engineering consultants listing comments and questions for consideration.

Please feel free to contact me or Ed Woyden at Gannett Fleming if you have any questions.

Very truly yours,

Frank B. Fabian, Jr.
Chairman

CC: Authority Members
Newtown Township
Newtown Borough
Bucks Co. Water & Sewer Auth.
Richard Danese,Jr., Esquire

Gannett Fleming
ENGINEERS AND PLANNERS

GANNETT FLEMING, INC.
Suite 100
650 Park Avenue
P.O. Box 60368
King of Prussia, PA 19406
Fax: (215) 265-8865
Office: (215) 337-1550

May 5, 1993

Frank B. Fabian, Jr., Chairman
Newtown, Bucks County,
Joint Municipal Authority
15 South Congress Street
P.O. Box 329
Newtown, PA 18940

Dear Frank:

City of Philadelphia
Draft Sewage Facilities Plan
(Act 537)

We have reviewed the information submitted to you by the City of Philadelphia pursuant to the above project. Portions of Chapters 3 and 5 of the draft plan prepared by BCM were reviewed. Supplemental information was received April 20 subsequent to our discussions with the Philadelphia Water Department. A review of the complete plan was not performed.

Based upon what we reviewed, we offer the following comments:

1. To the best of our knowledge neither the Philadelphia Water Department (PWD) or the Bucks County Water and Sewer Authority (BCWSA) had contacted the Borough, Township or Newtown Authority (NBCJMA) for wastewater flow projections for the planning period. It appears that flow projections were based upon the contractual limits in the Philadelphia-BCWSA Agreement. These may or may not be adequate for the planning period for the NBCJMA.

2. Section 5.2.2.2 of the Act 537 plan identifies 1990 average flows to the Neshaminy Interceptor to be 17.3 mgd. Table 3.2.3 reflects 1990 average daily flows to be 16.37 mgd. This should be clarified.

3. Section 5.2.2.2 states: "Based on the potential flows by the year 2000, it is expected that the agreement with the BCWSA and PWD will have to be revised to provide additional capacity." If this is the case, the BCWSA should request NBCJMA input to include current wastewater flow projections.

4. The PWD or the BCWSA should explain to the NBCJMA the reason why the Act 537 Plan is being performed at this time.

In general, the NBCJMA, Newtown Township and Newtown Borough, should have input into the planning process for this project. The BCWSA should inform Newtown Township, Borough and Authority of the conclusions drawn and impacts of the Act 537 Plan and what effects will result.

Please call if you have any questions.

Very truly yours,

GANNETT FLEMING, INC.

Edward L. Woyden

ELW:kad

cc: A. McNamara, H. Hickey
R. Danese

Whitemarsh TOWNSHIP

4021 JOSHUA ROAD
LAFAYETTE HILL, PA.
19444-1498
(825-3535)
FAX 215-825-9416

April 15, 1993

Dean Kaplan
Deputy Commissioner
City of Philadelphia
Water Department
ARA Tower at Reading Center
1101 Market Street
Philadelphia, PA 19107-2994

RE: Philadelphia County Sewage Facilities Plan Act 537

Dear Mr. Kaplan:

Thank you for sending me sections of the draft Sewage Facilities Plan for Philadelphia County, particularly those sections relating to Whitemarsh Township.

In reviewing the sections I noted that they did not contain any reference to a 1986 Agreement between Whitemarsh Township and Springfield Township providing for additional flows from Whitemarsh Township to Springfield Township and then to the sanitary sewers of Philadelphia through the Andorra Gauging Station. That agreement provided for a discharge from Whitemarsh Township through Springfield Township of an additional .180 mgd maximum daily flow and .77 cu. ft. per second maximum rate flow. This would bring the flows at this connection to .28 mgd average day and 1.30 cfs instantaneous maximum. A copy of the agreement between Whitemarsh Township and Springfield Township is enclosed.

The agreement was subject to acceptance by the City of Philadelphia, and a copy of James Palladino's letter of November 5, 1986 offering to accept the additional flow is also attached. We understand that Springfield Township and the City of Philadelphia have had continuing negotiations on revised agreements that would incorporate, among other things, this additional flow. We have not heard from Springfield Township or the City of Philadelphia that additional flows would not be accepted, only the terms under which they would be accepted, and assume that the agreement is acceptable subject to Springfield Township and the City of Philadelphia reach agreement on the terms of the overall Sewage Agreement.

We believe that the 537 Plan should include a reference to the Philadelphia Water Department's offer for the additional flow, our agreement with Springfield Township, and the status of the negotiations.

If you have any questions regarding this matter, please do not hesitate to call.

Very truly yours,

LAWRENCE J. GREGAN
Township Manager

LJG/e
Enclosure

cc: Board of Supervisors
Ross Weiss, Esquire
Thomas F. Zarko, P.E.
Donald Berger, Township Manager/Springfield Township

LOWER SOUTHAMPTON TOWNSHIP

1500 DESIRE AVENUE
FEASTERVILLE, PA 19053

(215) 357-7300
FAX (215) 357-0946

BOARD OF SUPERVISORS
SUSANNE MCKEON
DENNIS M. O'BRIEN
DANIEL FRALEY
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MARIE WALLACE

KATHLEEN R. GOLDHAHN
TOWNSHIP MANAGER

April 16, 1993

Mr. Dean Kaplan
Deputy Commissioner
City of Philadelphia
Water Department
ARA Tower at Reading Center
1101 Market Street
Philadelphia, Pa. 19107-2994

Dear Mr. Kaplan:

This is in response to your letter of April 8 regarding the draft Act 537 sewage facilities plan for Philadelphia County.

We have reviewed the draft as it pertains to our Township, and have found it to be informative and accurate.

Thank you for sending those sections of the draft which are of interest to us.

Sincerely,

LOWER SOUTHAMPTON TOWNSHIP

John F. Murphy
Director of Public Works

JFM/rab

MEMORANDUM **May 20, 1993**

Response to comments from Tributary Municipalities

Letters were sent out to ten contributing municipalities requesting comments on the draft Act 537 plan. Responses were received from five of them. Of those the following had comments that have been addressed below:

Bristol Township noted that in December 1989 they adopted an Act 537 Plan, which has not yet been approved by PADER. Any effect on the Philadelphia system will be evaluated after the Township Plan has been formally approved.

The Township of Lower Merion noted that in February 1993 they adopted an Act 537 Plan, which has not yet been approved by PADER. Any effect on the Philadelphia system will be evaluated after the Township Plan has been formally approved. The contributing area shown on Table 3.2.1 of the Philadelphia Plan refers to Lower Merion and Narberth. The portions of Haverford and Radnor that are contributory to Philadelphia are included in the table under the Upper Darby and DELCORA tabulations.

Newtown Bucks County Joint Municipal Authority.

Comment 1. Projections for this planning effort were indeed based on contractual limits which were considered adequate.

Comment 2. The discrepancy between average flows shown on Table 3.2.3 and in the text have been corrected.

Comment 3. The PWD agrees that there should be some discussion on this issue.

Comment 4. The PWD is currently being petitioned by PADER to conduct and prepare the County of Philadelphia/City of Philadelphia Act 537 Plan.

An additional response comment was received from Whitemarsh Township, which contributes to Philadelphia through Springfield Township. The text has been revised to include reference to an updated agreement between the two townships.

BCM
Engineers, Planners, Scientists and Laboratory Services
One Plymouth Meeting • Plymouth Meeting, PA 19462 • Phone: (215) 825-3800

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
FIELD OPERATIONS - WATER MANAGEMENT PROGRAM
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428
215 832-6130

APR. 29 1993

Leonard K. Bernstein, Coordinator
City of Philadelphia
Water Department
ARA Tower at Reading Center
1101 Market Street
Philadelphia, PA 19107-2994

Re: Act 537 Plan
Advisory Reveiw
City of Philadelphia
Philadelphia County

Dear Mr. Bernstein:

On March 9, 1993 this office received your Proposed Official Sewage Facilities Plan of the City of Philadelphia, Philadelphia County, entitled "City and County of Philadelphia, Act 537 Plan, Volumes 1 and 2", as prepared by BCM Engineers, Inc., dated March 1993. This plan is being submitted to this Department in accordance with the provisions set forth by Section 5 of the Pennsylvania Sewage Facilities Act and Chapter 71, the Administration of Sewage Facilities Program.

A preliminary review has indicated that the plan is not in accordance with the provisions set forth in Chapter 71 for the following reasons:

First, you are hereby adviced that this review is consultative only and not official. Also, this review is not a final action by the Department.

Second, there are several "paper items" which are missing from the submission. These items, listed below, must be provided when the "official" document is submitted to the Department.

The missing items include:

1. Act 537 Plan Content Checklist - At our March 26, 1993 meeting we distributed copies of the Department's "A Guide for Preparing Act 537 Update Revisions". While we urge the City of Philadelphia to consider reformatting the document, as a minimum, completion of the checklist showing how all relevant issues have been included in the plan will be required.

2. City of Philadelphia Planning Commission comments:

3. Response to comments of the Planning Commission:

4. Philadelphia County Health Department comments:

5. Response to comments of the Health Department:

6. Comments from the Four County Planning Commissions for which the City provides service:

7. Response to comments of County Planning Commissions:

8. Proof of publication in a local newspaper:

9. Response to comments of public review:

10. Proof of solicitation for comments by all tributary municipalities:

11. Response to comments of tributary municipalities:

12. Resolution of adoption from the Philadelphia City Council:

Third, there are several editorial comments which must be addressed prior to the "official" submission:

1. On page 2-7, figure 2.2-2 - Philadelphia Regional Service Area shows Easttown Township as part of the DELCORA system. Easttown Township is not part of DELCORA and is tributary to the Valley Forge Sewer Authority system. There may be other such instances that must be brought to the tributary municipalities for their confirmation.

2. On page 2-11, we believe the quoted Bucks County Wastewater Facility Plan Volume I, was withdrawn therefore, not relevant.

3. On page 3-34, we believe the listing of tributary municipalities is not complete. For example, the Bucks County Sewer and Water Authority also transports flows from Langhorne Manor Borough.

4. On page 3-44, it would be helpful if a table could be included that shows "Agreement Entity", "Capacity (MGD) covered by Agreement", "Termination Date of Agreement", "Status of Agreement", and "Status of Renewal"

5. On page 3-58, Table 3.4.5 is missing indication of units, we assume its acres, please confirm.

6. On page 4-34, the "Regulator Types" listing should be expanded to include identification of the 175 regulators and 23 diversion chambers.

7. On page 4-56, Table 4.3.8 is missing a summary line.

8. On page 4-67, Table 4.3.11 is missing a summary line.

9. On page 5-19 through 5-21, figures 5.3-1 through 5.3-3, it is difficult to distinguish between the charted flows, please clarify.

10. On page 6-2, a table is provided, however, can not identify the table number because of its location on the paper and binder holes.

11. On page 7-13, the Capital Improvement Program is missing a label.

Finally, the following technical issues must be resolved prior to the "official" submission.

1. On page 2-4, the plan states "The City of Philadelphia has indicated, for work plan purposes, that the only improvements currently being planned are for modifications (rehab) to the primary clarifiers at the NEWCPP". The plan is missing conclusions about the need to improve, expand or repair other parts of the City's sewer system, such as the combined sewer overflows.

2. On page 2-23, the wastewater flow and strength numbers presented do not correlate with the design studies and WQM Part II permits on record with the Department. Also, the information for SEWPCP is missing. Please re-examine the information and provide the design organic loading in pounds and concentration for all 3 facilities.

3. On page 2-28, under the discussion of infiltration/inflow, what is planned to be done to remove excessive I/I from the collection and conveyance systems, at least in the areas where the storm and sanitary lines are separated?

4. On page 2-31, what is the current status of land use planning in the City? It appears that the land use plan is twenty year's old. Have any of the land use plans 10 year projections become a reality?:

5. On page 4-1 through 4-9 regarding on-lot disposal systems, the submission does not provide an adequate basis for future planning of

these types of system. A mechanism of prioritizing the need for adequate sewerage facilities to areas of concentrated malfunctions is needed. Incorporating comments of the Philadelphia County Health Department will be necessary.

6. On page 4-12, the "Interceptors" section should include a listing of each segment's capacity, reserve capacity, capacity shortfalls and planned corrective actions.

7. On page 4-18, regarding the basis for interceptor design flow, additional details must be provided to support the use of 120 gallons per person and 2,000 gallons per day per acre of infiltration.

8. On page 4-21, additional explanation is needed regarding the diversion chambers, such as whether or not they are permanently fixed to divert flows to specific treatment facilities and a discussion of flow management.

9. On pages 4-21 through 4-33, regarding pump stations, overflows from pump stations must be addressed in this submission. Possible corrective actions include dual feed power or emergency generator back-up. Definitive plan of action for each pump station with documented overflow problems must be provided. Also, it appears the list of pump stations may not be complete, i.e. the new prison pump station off State Road or Center City buildings, subways, etc.

10. On page 4-35, regarding the combined sewer overflows, are the hydraulic cylinders that are tied into the City's potable water supply, which operate some of the CSO's property segregated to prevent cross contamination? The submission must include an evaluation of alternative corrective action plans such as replacing the water hydraulics with oil systems, a selection of an alternative and a schedule for implementation.

11. On page 4-42, discussions about the Chapter 94 situation must utilize recently agreed to numbers. Discrepancies, such as found on page 4-53, must be resolved.

12. On page 5-1, please clarify whether or not the hydraulic design capacity of the SEWPCP was downsized as a result of the 1980 population projections.

13. On page 5-5, please compare 1990 U.S. Census data to the City's Planning Commission data, the Delaware Valley Regional Planning Commission data and tributary municipalities population data.

APR 29 1993

Leonard K. Bernstein, Coordinator

- 5 -

14. On page 5-3 and 5-4, the categorical use section appears to be based on outdated information. Please update and re-evaluate.

15. On page 5-9, the selected highlights of the potential development projects in Center City did not include Spectrum II. Please clarify why this project is not listed.

16. On page 5-16, please identify any streams which may have been incorporated into the sewer collection system.

17. On page 6-30, please indicate the long range plans for the sludge lagoons at the NEWPCP and the SWWPCP.

18. On page 7-10, the Department expects the methane facilities to be completed by May 1993. Please clarify the statement "not expected to occur for at least two years".

In summary, while the plan presents much good information, many other details need clarification and expansion. In particular, we wish to stress the need for the City to be very clear in the final plan as to the specific activities proposed for implementation including funding strategies and implementation periods. Other activities not proposed for immediate implementation should be prioritized and dates for initiation of future studies included.

When the necessary corrections and additions have been completed, as listed above, this Department will initiate a review in accordance with the provisions of Chapter 71, Administration of the Sewage Facilities Program.

Very truly yours,

Glenn K. Stinson

GLENN K. STINSON, R.S.
Sewage Facilities Consultant

cc: Mr. Furlan
Philadelphia Planning Commission
Philadelphia Health Department
BCM, Mr. Graber
Planning Section
Re 30 (KAL)116.3/.1

BCM Engineers Inc.
Engineers, Planners, Scientists and Laboratory Services

One Plymouth Meeting • Plymouth Meeting, PA 19462 • (215) 825-3800 • FAX (215) 834-8236

May 20, 1993

Department of Environmental Resources
Field Operations, Waste Management Program
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

Attention: Mr. Glenn K. Stinson, R.S.
Sewage Facilities Consultant

Subject: City of Philadelphia Act 537 Plan
Response of PADER Advisory Review
BCM No. 00-0740-0201

Gentlemen:

On behalf of the City of Philadelphia and the Philadelphia Water Department (PWD), we hereby respectfully submit the following information for your review and approval. Responses have been made point by point to PADER review comments by letter to Mr. Bernstein of the PWD dated April 29, 1993. As appropriate, these responses have been structured to revise the subject Act 537 Plan document, and are so stated. The comments have been categorized into three different areas as follows:

I. MISSING ITEMS

Comment 1. **Act 537 Plan Content Checklist - At our March 26, 1993 meeting we distributed copies of the Department's "A Guide for Preparing Act 537 Update Revisions". While we urge the City of Philadelphia to consider reformatting the document, as a minimum, completion of the checklist showing how all relevant issues have been included in the plan will be required.**

Response 1. This checklist has been developed by PADER subsequent to our initiation and development of the City of Philadelphia Act 537 Plan. While the Plan's Task Activity Report was approved by PADER in May 1990, this guide, in checklist format, was not published until November 1992 and not provided to the PWD until the Philadelphia

Plan was substantially complete. Therefore, whereas it would require a significant, substantially unproductive effort to reformat the City of Philadelphia Act 537, we believe that the Plan meets the Act 537 guideline requirements. Accordingly, we have attached a completed checklist to this response letter with the appropriate section number references as applicable.

This response to PADER's unofficial review has been incorporated into Appendix P, General Correspondence of the Plan. It should be understood, as was stressed with PADER at our May 1990 kickoff meeting for this Plan, that the uniqueness of this City of Philadelphia/County of Philadelphia regional Plan must be acknowledged in reviewing the requirements of this checklist and comparing same to the goals and objectives of this Act 537 Plan for the City of Philadelphia.

Comment 2 through 7. **Planning Commission and Health Department Comments and Responses:**

Response 2 through 7. The comments of the Planning Commissions and the City of Philadelphia Health Department have all been solicited and both comments and appropriate responses are incorporated into Appendix P of the Act 537 Plan.

Comments 8 and 9. **Proof of publication in a local newspaper and responses to the public's written comments:**

Response 8 and 9. Incorporated into Appendix P is a copy of the Proof of Publication, for purposes of acknowledging the 30 day public comment period. This public comment period commenced on May 14, 1993; no written comments were received on the Plan.

Comments 10 and 11. **Proof of Solicitation for Comment of Tributary Municipalities and Response thereto:**

BCM

Responses 10 and 11. Incorporated into Appendix P is a copy of the sample letter and a list of all municipalities to which the letters were sent. The PWD received comments from four municipalities at the time of this letter. Appropriate responses have also been included.

Comment 12. **Resolution of Adoption from the Philadelphia City Council:**

Response 12. The City Council of the City of Philadelphia, by the time of official submission of the Act 537 Plan to PADER will have adopted the subject Plan as its Official Act 537 Plan by municipal resolution. A copy of the enacted resolution will be included in Appendix Q of the Plan.

II. EDITORIAL COMMENTS

Comment 1. **On page 2-7, figure 2.2-2 - Philadelphia Regional Service Area shows Easttown Township as part of the DELCORA system. Easttown Township is not part of DELCORA and is tributary to the Valley Forge Sewer Authority system. There may be other such instances that must be brought to the tributary municipalities for their confirmation.**

Response 1. The Draft Act 537 Plan's figure 2.2-2 represented the regional City of Philadelphia WPCP service area via prior graphics. After further investigation and contact of the appropriate Authority, it appears that only 3 to 4 homes in Easttown Township are serviced by the Philadelphia WPCP system. We have revised this figure accordingly in the Official Act 537 Plan.

Comment 2. **On page 2-11, we believe the quoted Bucks County Wastewater Facility Plan Volume I, was withdrawn therefore, not relevant.**

Response 2. It is our understanding that the quoted Bucks County Wastewater Facility Plan is available but was not submitted for formal approval. However, our purposes for referencing herein were simply literary credits; the material excerpted pertains to Federal and State water pollution control regulations which are not affected by any rescinding of the referenced Bucks County Plan. We have however, deleted reference herein to avoid further confusion.

Comment 3. **On page 3-34, we believe the listing of tributary municipalities is not complete. For example, the Bucks County Sewer and Water Authority also transports flow from Langhorne Manor Borough.**

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Response 3. We have rechecked our sources and have indeed found that Langhorne Manor Borough is missing from this specific listing in the Draft Act 537 Plan. This has been corrected in the official Act 537 Plan; please note however, that other references to Langhorne Manor Borough are already included in this Plan.

Comment 4. **On page 3-44, it would be helpful if a table could be included that shows "Agreement Entity", "Capacity (MGD) covered by Agreement", "Termination Date of Agreement", "Status of Agreement", and "Status of Renewal".**

Response 4. In order to accommodate PADER and provide the requested additional information, we have developed an additional table, Table 3.2.2, and have revised the text in this subsection accordingly.

Comment 5. **On page 3-58, Table 3.4.5 is missing indication of units, we assume its acres, please confirm.**

Response 5. The units are indeed acres and the Table has been revised to reflect this.

Comment 6. **On page 4-43, the "Regulator Types" listing should be expanded to include identification of the 175 regulators and 23 diversion chambers.**

Response 6. The text has been revised to reflect a reference to detailed listings of the CSO's, which appear in Appendix H.

Comment 7. **On page 4-56, Table 4.3.8 is missing a summary line.**
Comment 8. **On page 4-67, Table 4.3.11 is missing a summary line.**

Responses 7 and 8 Summary information has been incorporated.

Comment 9. **On page 5-19 through 5-21, Figures 5.3-1 through 5.3-3, it is difficult to distinguish between the charted flows, please clarify.**

Response 9. Figures have been revised for clarification purposes.

Comment 10. **On page 6-2, a table is provided, however, can not identify the table number because of its location on the paper and binder holes.**

Response 10. Table has been realigned.

Comment 11. **On page 7-13, the Capital Improvement Program is missing a label.**

Response 11. The information has been titled as Table 7.3.1 and text revised accordingly.

III. TECHNICAL ISSUES

Comment 1. **On page 2-4, the Plan states "The City of Philadelphia has indicated, for work plan purposes, that the only improvements currently being planned are for modifications (rehab) to the primary clarifiers at the NEWCPP". The Plan is missing conclusions about the need to improve, expand, or repair other parts of the City's sewer system, such as the combined sewer overflows.**

Response 1. The above excerpt from the Act 537 Plan indicated that, at the time the work plan was being developed for this report, the modifications (rehabilitation) to the Primary Clarifiers at the NEWPCP was the only significant capital project identified by the PWD which had progressed from the planning phase into not only the design, but indeed the construction phase. Indeed, this Act 537 Plan, in Sections 4, 5, 6 and 7, delves into the evaluation of existing facilities, projection of future conditions, identification of needs, and plan selection for each of the following individual areas:

- On-Lot Disposal Systems (Unsewered Areas)
- Collection and Conveyance Systems
- Combined Sewer Overflows (CSO's)
- Water Pollution Control Plants (WPCP's), and
- Biosolids Management

It was agreed upon with PADER at the Work Plan approval stage and stated in the Act 537 Plan (also on page 2-4), that "The County of Philadelphia Act 537 Plan is intended to serve as a general regional planning document establishing policy, goals, and the need for detailed investigations of specific long term problem areas." The Act 537 Plan does not only evaluate these other areas, but does make conclusions as to immediate needs, in most cases additional study where problems have been identified. These conclusions are clearly stated in Section 7.2 of the Act 537 Plan.

Comment 2. **On page 2-23, the wastewater flow and strength numbers presented do not correlate with the design studies and WQM Part II permits on record with the Department. Also, the information for SEWPCP is missing. Please re-examine the information and provide the design organic loading in pounds and concentration for all 3 facilities.**

Response 2. This section of the Act 537 Plan, 2.5.1.4., Revisions to the Wastewater Flow and Strength Projections for the Northeast and Southwest Water Pollution Control Plants, for the Philadelphia Water Department, is specific in its' objective of factually reviewing this specific prior planning document. Based upon the report we reviewed, this information is correct.

It is possible that these figures do not agree with the WQM Part II permits on record, which were not reviewed as a part of this study. However, the current permitted and design values have been included in the Act 537 Plan, in Section 4.3 and 5.3 (Table 5.3.7). We have also reviewed these numbers for consistency with the NPDES permit values. Finally, there were no revised loadings presented in the subject 1983 report for the Southeast WPCP.

Comment 3. **On page 2-28, under the discussion of infiltration/inflow, what is planned to be done to remove excessive I/I from the collection and conveyance systems, at least in the areas where the storm and sanitary lines are separated?**

Response 3. Firstly, this portion of the report again deals only with the review of prior planning documents. However, at this time the PWD does not have any plans for attempted elimination of I/I from the separate sanitary system. The PWD believes that the existing SSES studies, although of some planning merit, cannot substantiate any future efforts focused on rehabilitation of the system specifically to effectuate I/I removal. Moreover, the question of cost effectiveness of I/I removal versus treatment is significant considering the fact that the majority of the City is a combined system and that the WPCP problems are related to inflow and stormwater, not infiltration. It is believed that the primary focus for the collection system should remain on the CSO issue, and that any I/I studies should only be undertaken in the overall context of the proposed CSO conceptual studies, which are yet to be developed.

Comment 4. **On page 2-31, what is the current status of land use planning in the City? It appears that the land use plan is twenty year's old. Have any of the land use plans 10 year projections become a reality?**

Response 4. As stated in Section 2.5.3 of the Plan, the two primary guidance documents for growth and development in the City of Philadelphia are the Comprehensive Plan (1960) and the Zoning Code, (1962) as amended (Chapter 14 of the Philadelphia Code)

Since 1960, the City, in lieu of making one single revision to these documents, has chosen to develop district or functional area plans for certain neighborhoods. Plans for districts such as Roxborough - Manyunk, North Philadelphia, Center City, and West Philadelphia have been completed.

Systematic revisions to the City's Zoning Code have been ongoing since the 1970's as a cooperative effort between City Council and the City of Philadelphia Planning Commission. As an example, the Center City area went through zoning revisions about two years ago.

Clearly, City Council, the Mayor, and the City Planning Commission have tried to provide for flexibility and adaptability in their planning efforts to respond to developer interest by developing focused plans. It should be noted, however, that these plans are provided only as a planning tool, often establishing only broad goals and objectives as identified in the Act 537 Plan review. Accordingly, it is not possible to gauge the accomplishment of these plans.

The text has been revised to include some of these observations and the City Planning Commission has endorsed the Plan.

Comment 5. **On page 4-1 through 4-9 regarding on-lot disposal systems, the submission does not provide an adequate basis for future planning of these types of system. A mechanism of prioritizing the need for adequate sewerage facilities to areas of concentrated malfunctions is needed. Incorporating comments of the Philadelphia County Health Department will be necessary.**

Response 5. Section 7.2.1 of the Draft Act 537 Plan indicated that, for various reasons, including the existence of public water supply (therefore lack of a public health issue) and the apparent low rate of reported malfunctions that PWD does not see the need to programmatically eliminate all OLDS from the City. However, realizing the limitations

of the available information, the PWD anticipates developing a more rigorous approach to evaluating these areas in a coordinated fashion with the Health Department. Section 7.0 of the Act 537 Plan will be revised accordingly.

All Health Department comments have been addressed and incorporated into the Act 537 Plan.

Comment 6. **On page 4-12, the "Interceptors" section should include a listing of each segment's capacity, reserve capacity, capacity shortfalls, and planned corrective actions.**

Response 6. As indicated in section 4.2.2. of the Act 537 Plan, the PWD utilizes a computer model to relate design capacity. A complete listing of each reach's capacity and shortfalls is compiled; this listing is too voluminous to include in the Act 537 Plan. Accordingly, Appendix F includes only those reaches which are "theoretically" over capacity. As discussed in the report, due to the very conservative nature of this analysis, it is recommended that flow monitoring and operations inspections be performed as a next step in this evaluation.

Comment 7. **On page 4-18, regarding the basis for interceptor design flow, additional details must be provided to support the use of 120 gallons per person and 2,000 gallons per acre of infiltration.**

Response 7. This basis of design has been utilized by the PWD for over 20 years, has been accepted under the EPA construction grants program, and has proven to be an acceptable basis when coupled with the otherwise conservative interceptor design in the following areas:

- Designed for 110 percent of dry weather design flows
- Interceptor design based on a fraction (1/2 or 2/3) of full pipe
- Design densities (person per acre) overly conservative. See Table 4.2.3 of Act 537 for density comparison.

The basis for the infiltration allowance is unknown.

Comment 8. **On page 4-21, additional explanation is needed regarding the diversion chambers, such as whether or not they are permanently fixed to divert flows to specific treatment facilities and a discussion of flow management.**

Response 8. Additional information has been provided in the Act 537 Plan.

Comment 9. **On pages 4-21 through 4-33, regarding pump stations, overflows from the pump station must be addressed in this submission. Possible corrective actions include dual feed power or emergency generator back-up. Definitive plan of action for each pump station with documented overflow problems must be provided. Also, it appears the list of pump stations may not be complete, i.e., the new prison pump station off State Road or Center City buildings, subways, etc.**

Response 9. Overflows that have occurred at pumping stations are logged by the PWD and reported to PADER. All recent occurrences have been minor in duration, with the majority being caused by power failures. All PWD pumping stations either have dual feed power supply, as stated in the Act 537 Plan (two stations), or are presently covered by a service contract which provides a portable generator for standby power within two hours. This latter information has been incorporated into the Act 537 Plan.

All PWD pumping stations are incorporated into the Act 537 Plan.

Comment 10. **On page 4-35, regarding the combined sewer overflows, are the hydraulic cylinders that are tied into the City's potable water supply, which operate some of the CSO's property segregated to prevent cross contamination? The submission must include an evaluation of alternative corrective action plans such as replacing the water hydraulics with oil systems, a selection of an alternative and a schedule for implementation.**

Response 10. As stated on page 4-43 of the Plan, only 14 of the 175 CSO regulators in Philadelphia are of the water hydraulics type. All of these are provided with backflow preventers for cross connection control. Details of specific CSO operations and evaluations related thereto are beyond the scope of this report. The Act 537 Plan has indicated that one area of the selected plan is to conduct a detailed CSO conceptual plan. This type of evaluation will be considered a part of that study. Indeed, the EPA requirements for implementation of Best Management Practices (BMP) under the proposed draft CSO guidance documents specifically require an evaluation of operations and maintenance of CSO regulators as a part of that conceptual plan.

Comment 11. **On page 4-42, discussions about the Chapter 94 situation must utilize recently agreed to numbers. Discrepancies, such as those found on page 4-53, must be resolved.**

Response 11. The values presented in the Act 537 Plan are based upon our understanding of agreement for loadings which were last revised by PWD to PADER. Loading descrepancies are being addressed by PWD as indicated in Section 7.4 of this Plan. The PWD intends to petition PADER for a WPCP rerating based upon the facts that portions of the WPCP have a greater design capacity than permitted capacity.

Comment 12. **On page 5-1, please clarify whether or not the hydraulic design capacity of the SEWPCP was downsized as a result of the 1980 population projections.**

Response 12. Based upon our information, there was a downsizing of the SEWPCP based upon a reevaluation of the 1980 projections. However, such downsizing for the NEWPCP and SEWPCP was not documented in the same design report.

Comment 13. **On page 5-5, please compare 1990 U.S. Census data to the City's Planning Commission data, the Delaware Valley Regional Planning Commission data and tributary municipalities population data.**

Response 13. All agencies referenced have been utilizing 1990 U.S. Census data.

Comment 14. **On page 5-3 and 5-4 the categorical use section appears to be based on outdated information. Please update and re-evaluate.**

Response 14. The information utilized in the Act 537 Plan is the only available information on categorical use. None of the prior planning studies relied on this information and the classic means of gathering current information in these type studies, use of water account data, categorized by customer account type, is not available for the City. Therefore, it appears that the only feasible way of updating this information would be to conduct an extensive program of I/I studies. These efforts would, nevertheless prove of marginal utility and are certainly beyond the scope of this Plan. We do, however, believe that the analysis provided in the Act 537 Plan is still characteristic of the planning area. Finally, the significance of the updated information would be marginal, considering the relative magnitude of wet weather versus dry weather capacity issues at the WPCP's

Comment 15. **On page 5-9, the selected highlights of the potential development projects in Center City did not include Spectrum II. Please clarify why this project is not listed.**

Response 15. Information was not yet compiled by the Planning Commissin at the time the Plan was being developed. We have now included limited information both in this section of the Plan and in Appendix M.

Comment 16. **On page 5-16, please identify any streams which may have been incorporated into the sewer collection system.**

Response 16. The City does not maintain a list of streams that may have incorporated into the sewerage system. A potential list was presented in Section 3.1.5.

Comment 17. **On page 6-30, please indicate the long range plans for the sludge lagoons at the NEWPCP and the SWWPCP.**

Response 17. A study by a consultant was conducted regarding lagoon closure for the Water Department. However, additional information is needed in order to complete all of PADER's information requirements. Consequently, the Water Department is in the process of obtaining additional information. Once the information has been obtained, the Water Department will conduct discussions with PADER regarding the best plan for the lagoons and a time table for completion of closure.

Comment 18. **On page 7-10, the Department expects the methane facilities to be completed by May 1993. Please clarify the statement "not expected to occur for at least two years".**

Response 18. The methane facilities are indeed expected to be operational by May 1993. The text has been revised accordingly.

BCM

We hope this information, in conjunction with the pertinent revisions to the Act 537 Plan, will satisfy you request. If you have any questions, please contact us.

Very truly yours,

Daniel A. Graber, P.E.
Senior Project Manager

Thomas R. Smith, P.E.
Assistant Vice President

/spk
cc: L. Bernstein
D. McCuster

ACT 537 PLAN CONTENT AND ENVIRONMENTAL ASSESSMENT CHECKLIST

For specific details covering the ACT 537 Planning Requirements, refer to Chapters 71 and 73 of the Department's Regulations.

A COPY OF THIS COMPLETED CHECKLIST MUST BE INCLUDED WITH YOUR ACT 537 PLAN. THE DEPARTMENT WILL USE THE "DER USE ONLY" COLUMN DURING THE COMPLETENESS EVALUATION OF THE PLAN. THIS COLUMN MAY ALSO BE USED BY THE DEPARTMENT DURING THE PREPLANNING MEETING WITH THE MUNICIPALITY TO IDENTIFY PLANNING ELEMENTS WHICH WILL NOT BE REQUIRED TO BE INCLUDED IN THE PLAN. ALL THE PLANNING ELEMENTS REQUIRED BY THE DEPARTMENT MUST BE ADDRESSED IN YOUR PLAN OR THE PLAN WILL BE RETURNED AS INCOMPLETE. THE PAGE NUMBER OR OTHER REFERENCE MUST BE LISTED IN COLUMN 2 OF THE CHECKLIST PRIOR TO PLAN SUBMITTAL. IF THE MUNICIPALITY DETERMINES THAT ANY ITEMS LISTED IN THIS CHECKLIST DO NOT APPLY, OR CONDITIONS STATED IN A CERTAIN PART OF THIS CHECKLIST DO NOT EXIST IN AN AREA, A COMMENT MUST BE INCLUDED IN COLUMN 2 WHICH STATES THAT THE PARTICULAR CHECKLIST ITEM WILL HAVE NO IMPACT ON THE PLAN OR THAT IT DOES NOT EXIST IN THE PLANNING AREA. WHEN INFORMATION REQUIRED AS PART OF AN OFFICIAL PLAN UPDATE REVISION HAS BEEN DEVELOPED SEPARATELY OR IN A PREVIOUS UPDATE REVISION, INCORPORATE THE INFORMATION BY REFERENCE TO THE PLANNING DOCUMENT AND PAGE. THREE COPIES OF THE COMPLETED PLAN WITH ALL ATTACHMENTS MUST BE SUBMITTED TO THE DEPARTMENT.

Municipality: City of Philadelphia

County: Philadelphia

Local Municipal Contact Official: Leonard Bernstein

Telephone Number of Official: 215-592-6367

Consultant: BCM Engineers Inc.

Consultant's Telephone Number: 215-825-3800

Consultant's Contact Person: Daniel Graber

Title of Submission: Act 537 Plan

Date Submitted: May 20, 1993

☐ 3 copies of Plan submitted to the Department (including supporting documentation)

COMPLETENESS CHECKLIST

DER Use Only	Indicate Page #(s) in Plan	Item Required
	ii	1. Table of Contents
		2. Plan Summary
	Sect. 1.0	A. Identify the proposed service areas and major problems evaluated in the plan. (Reference-Title 25, § 71.21.a.7.i)
	Sect. 1.0	B. Identify the alternative(s) chosen to solve the problems and serve the areas of need identified in the plan. Also, include any institutional arrangements necessary to implement the chosen alternative(s). (Reference-Title 25, § 71.21.a.7.ii)
	Sect. 1.0	
		C. Include the cost of implementing the proposed alternative (including the user fees) and the proposed funding method to be used. (Reference-Title 25, § 71.21.a.7.ii)
	Sect. 1.0	D. Identify the municipal commitments necessary to implement the plan. (Reference-Title 25, § 71.21.a.7.iii)

Only	in Plan	Item Required
_____	Sect. 1.0	E. Provide a schedule of implementation for the project which identifies the major milestones with dates necessary to accomplish the project to the point of operational status. Other milestones in the project implementation schedule should be indicated as occurring a finite number of days from a major milestone. (Reference-Title 25, § 71.21.a.7.iv)
_____	Sect. 1.0	F. Include dates for the future initiation of feasibility evaluations in the project's implementation schedule for areas proposing completion of sewage facilities for planning periods in excess of five years. (Reference-Title 25, § 71.21.b)
_____	Appendix Q	3. Original, signed and sealed Resolution of Adoption by the Municipality which contains, at a minimum, alternatives chosen and a commitment to implement plan as stated in the implementation schedule. (Reference-Title 25, § 71.31.f) Section V.F of Guidance.
_____	Appendix P	4. Evidence that the municipality has requested, reviewed, and considered comments by appropriate official: planning agencies of the municipality, planning agencies of the county, planning agencies with areawide jurisdiction (where applicable), and existing county or joint county departments of health. (Reference-Title 25, § 71.31.b) Section V.E.1. of guidance.
_____	Appendix P	5. Proof of Public Notice which documents proposed plan adoption, plan summary, and the establishment of a 30 day comment period. (Reference-Title 25, § 71.31.c) Section V.E.2 of guidance.
_____	Appendix P	6. Copy of ALL written comments received and municipal response to each comment in relation to the proposed plan. (Reference-Title 25, 71.31.c) Section V.E.2 of guidance.
_____	Sect. 7.4	7. Project Implementation Schedule. (Provide projected milestone dates and be detailed for each existing and future needs area). (Reference - Title 25, § 71.31.d) Section F of Guidance.
_____	Appendix A,B	8. Project Implementation Ordinances (Provide existing ordinances or include the development of new ordinances in the schedule of implementation.) (Reference-Title 25, § 71.21.a.5.vi.D) Section V.F of guidance.
_____	Appendix P	9. Written documentation indicating that the appropriate agencies have received, reviewed and concurred with the method proposed to resolve identified inconsistencies within the proposed alternative and consistency requirements in 71.21.(a)(5)(i)-(iii). (Reference-Title 25, § 71.31.e) Appendix B of guidance.

GENERAL PLAN

I. **Previous Wastewater Planning**

_____	Sect. 2.5 Sect. 2.1.3	A. Identify and analyze all existing wastewater planning that:
_____	N/A	1. Has been previously undertaken under the Sewage Facilities Act (Act 537). (Reference-Act 537, Section 5, § d.1)
		2. Has not been carried out according to an approved implementation schedule contained in the plans. (Reference-Title 25, § 71.21.a.5.i.A - D) Section V.F of Guidance.

DER Use Only	Indicate Page #(s) in Plan	Item Required
	N/A	3. Is anticipated or planned by applicable sewer authorities. (Reference-Title 25, § 71.21.a.5.i.A) Section V.D. of Guidance.
	N/A	4. Has been done through official plan revisions (planning modules) and addenda. (Reference-Title 25, § 71.21.a.5.i.A)
		B. Identify all municipal and county planning documents adopted pursuant to the Pennsylvania Municipalities Planning Code (Act 247) including:
	Sect. 2.5.3	1. All land use plans and zoning maps which identify residential, commercial, industrial, agricultural, recreational, and open space areas. (Reference-Title 25, § 71.21.a.3.iv)
	N/A	2. A comparison of proposed land use as allowed by zoning and existing sewage facility planning. (Reference-Title 25, § 71.21.a.3.iv)
	Sect. 2.5.3	3. Zoning or in the absence of zoning subdivision regulations that establish lot sizes predicated on sewage disposal methods. (Reference-Title 25, § 71.21.a.3.iv)
	Sect. 2.5.3	4. All limitations and plans related to floodplain and stormwater management and special protection areas. (Reference-Title 25, § 71.21.a.3.iv) Appendix B, Section II.F.
	Sect. 2.5.3.3.1.1	5. An analysis of land use planning and zoning and its consistency with protecting environmentally sensitive areas, with special attention to: (Reference-Title 25, § 71.21.a.3.iv) - public ground/surface water supply sources - recreational water use areas - groundwater recharge areas - industrial water use - wetlands
		II. Physical and Demographic Analysis utilizing written description and mapping:
		A. Base line mapping (All maps should show all current lots and structures).
	Sect. 2.2	1. Identification of Planning Area(s), Municipal Boundaries, Sewer Authority/ Management Agency service area boundaries. (Reference-Title 25, § 71.21.a.1.i)
	Sect. 3.1.5	2. Identification and Mapping of Physical Characteristics (streams, lakes, impoundments, natural conveyance channels, drainage basins in the planning area). (Reference-Title 25, § 71.21.a.1.ii)
	Sect. 3.1.2	3. Soils - Analysis with description by soil type and soils mapping (with any topographic limitations) showing areas suitable for conventional on-lot systems, elevated sand mounds, and areas unsuitable for on-lot systems. (Reference-Title 25, § 71.21.a.1.iii). Mapping of Prime Agricultural Soils and locally protected agricultural soils. (Reference - Title 25, § 71.21.a.5.i.K)
	Sect. 3.1.1	4. Geologic Features - Identification through analysis, mapping and their relation to existing (including areas where existing nitrate-nitrogen levels are in excess of 5 mg/l) or potential nitrate-nitrogen pollution and drinking water sources. (Reference-Title 25, § 71.21.a.1.iii)

Only	Page # (s) in Plan	Item Required
_____	Sect. 3.1.2	5. Topography - Showing slopes that are suitable for conventional systems; slopes that are suitable for elevated sand mounds and slopes that are unsuitable for on-lot systems. (Reference-Title 25, § 71.21.a.1.ii)
_____	Sect. 3.1.7	6. Potable Water Supplies - Identification through mapping, description and analysis to include available public water supply capacity and aquifer yield for groundwater supplies. (Reference-Title 25, § 71.21.a.1.vi) Section V.C. of the Guidance.
_____	Sect. 3.1.6	7. Wetlands - Identify wetlands as defined in Title 25, Chapter 105 by description, analysis and mapping. Proposed collection, conveyance and treatment facilities and lines must be located and labeled, along with the identified wetlands, on the map. (Reference-Title 25, § 71.21.a.1.v) Appendix B, Section II.I.
_____	Sect. 3.4 Sect. 5.2	8. Population - List historical, current and future population figures and projections of the municipality. Discuss and evaluate any discrepancies between municipal, county, state (DER), and federal population projections as they relate to sewage facilities. (Reference-Title 25, § 71.21.a.1.iv)

III. Existing Sewage Facilities in the Planning Area.

A. Identify, map and describe municipal and nonmunicipal, individual and community sewerage systems in the planning area including:

_____	Sect. 4 Sect. 4.2 Sect. 4.3	1. Location, size and ownership of treatment facilities, main intercepting lines, pumping stations and force mains including their size, capacity, point of discharge. Also include the name of the receiving stream, drainage basin, and the facility's effluent discharge requirements. (Reference-Title 25, § 71.21.a.2.i.A)
_____	Sect. 4.3.1 Sect. 4.3.2 Sect. 4.3.3	2. A narrative and schematic diagram of the facility's basic treatment processes including the facility's NPDES permitted capacity, any remaining reserve capacity and the policy concerning the allocation of reserve capacity. (Reference-Title 25, § 71.21.a.2.i)
_____	Sect. 4.3.1.3 Sect. 4.3.1.4 Sect. 4.3.2.3 Sect. 4.3.2.4 Sect. 4.3.3.3 Sect. 4.3.3.4	3. A description of problems with existing facilities, including existing or projected overload under Title 25, Chapter 94 (relating to municipal wasteload management) or violations of a national pollutant discharge elimination system (NPDES) permit, Clean Streams Law permit, or other permit, rule or regulation of the Department. (Reference-Title 25, § 71.21.a.2.i.B)
_____	Sect. 6.1.1 Sect. 6.1.2 Sect. 6.1.3	4. Details of scheduled or in-progress upgrading or expansion of treatment facilities and the anticipated completion date of the improvements. Also discuss the compatibility of the rate of growth to existing and proposed wastewater treatment facilities. (Reference-Title 25, § 71.21.a.4.i & ii)
_____	N/A	5. A detailed description of operation and maintenance requirements and the status of past and present compliance with these requirements and any other requirements relating to sewage management programs. (Reference-Title 25, § 71.21.a.2.i.C)
_____	_____	6. Ultimate disposal areas, if other than stream discharge (land application) and any applicable groundwater limitations. (Reference-Title 25, § 71.21.a.4.i & ii)

DER Use Only	Indicate Page #(s) in Plan	Item Required
		B. Identify, map and describe areas that utilize individual and community on-lot sewage disposal and retaining tank systems in the planning area including:
	Sect. 4.1	1. The type of systems in use. (Reference-Title 25, § 71.21.a.2.ii.A)
	Table 4.1-1 ~~Appendix E~~	2. A description of documented and potential public health pollution, and operational problems (including malfunctioning systems) with the systems, including violations of local ordinances, the Sewage Facilities Act, the Clean Streams Law or regulation promulgated thereunder. (Reference-Title 25, § 71.21.a.2.ii.B)
	Sect. 4.1.2	3. A comparison of the types of on-lot sewage systems installed in an area with the types of systems which are appropriate for the area according to soil, geologic conditions, topographic limitations, sewage flows, and Title 25 Chapter 73 (relating to standards for sewage disposal facilities). (Reference-Title 25, § 71.21.a.2.ii.C)
	N/A	4. Conducting a well water survey to identify possible contamination by malfunctioning on-lot sewage disposal systems. Approximately 15% of the wells in the study area should be sampled. (Reference-Title 25, § 71.21.a.2.ii.B)
	Sect. 4.1.4 Sect. 4.3.4	C. Identify wastewater sludge and septage generation, transport, and disposal methods as it relates to sewage facilities alternative analysis including:
	Sect. 4.1.4 Sect. 4.3.4	1. Location of sources of wastewater sludge or septage (Septic tanks, holding tanks, wastewater treatment facilities). (Reference-Title 25, § 71.71)
	Sect. 4.3.4	2. Quantities of the types of sludges or septage generated. (Reference-Title 25, § 71.71)
	N/A	3. Present disposal methods, locations, capacities, and transportation methods. (Reference-Title 25, § 71.71)
		D. Identify, map and describe areas in the municipality where unpermitted collection and disposal systems ("wildcat" sewers, borehole disposal, etc.) are in use. (Reference-Title 25, § 71.21.a.2.i.B)
		IV. Future Growth and Development
	Sect. 3.4	A. Delineate and describe the following through map, text and analysis:
	Sect. 3.4.3	1. Areas with existing development or plotted subdivisions. Include the name, location, description, total number of EDU's in development, total number of EDU's currently developed, and total number of Equivalent Dwelling Units (EDUs) remaining to be developed (include time schedule for EDU's remaining to be developed). (Reference-Title 25, § 71.21.a.3.i)
	Sect. 5.2	2. Land use designations established under the Pennsylvania Municipalities Planning Code (35 P.S. 10101-11202), including residential, commercial and industrial areas. (Reference-Title 25, § 71.21.a.3.ii)
		3. Future growth areas and population and EDU projections for these areas. (Reference-Title 25, § 71.21.a.3.iii)

DER Use Only	Indicate Page #(s) in Plan	Item Required
	Sect. 2.5.3	4. Zoning, subdivision regulations; local, county or regional comprehensive plans; and existing plans of a Commonwealth agency relating to the development, use and protection of land and water resources. (Reference-Title 25, § 71.21.a.3.iv)
		5. Sewage planning required to provide adequate wastewater treatment for areas of the municipality and related to:
	Sect. 5.2	a. Five-year population and growth impacts on existing and proposed wastewater collection and treatment facilities which support the need for expansions of facilities within the five-year time frame. (Reference-Title 25, § 71.21.a.3.v)
	Sect. 5.2	b. Ten-year population and growth impacts on existing and proposed wastewater collection and treatment facilities which support the need for expansions of facilities within the ten-year time frame. (Reference-Title 25, § 71.21.a.3.v)
		V. Alternatives to Provide New or Improved Wastewater Disposal Facilities
		A. Identify alternatives available to provide for new or improved sewage facilities for each area of need including, but not limited to: (Reference-Title 25, § 71.21.a.4)
	Sect. 7.1	1. Regional Wastewater Treatment Concepts. (Reference-Title 25, § 71.21.a.4)
	Sect. 5.4 Sect. 7.1	2. The potential for extension of existing municipal or non-municipal sewage facilities to areas in need of new or improved sewage facilities. (Reference-Title 25, § 71.21.a.4.i)
	Sect. 6.2.1, 6.1 Sect. 6.2, 6.3	3. The potential for the continued use of existing municipal or non-municipal sewage facilities through one or more of the following: (Reference-Title 25, § 71.21.a.4.ii)
		a. Repair. (Reference-Title 25, § 71.21.a.4.ii.A)
	6.2.1, 6.1, 6.2, 6.3	b. Upgrading. (Reference-Title 25, § 71.21.a.4.ii.B)
	6.1, 6.2, 6.3	c. Improved operation and maintenance. (Reference-Title 25, § 71.21.a.4.ii.C)
	6.1, 6.2, 6.3	d. Other applicable actions that will resolve or abate the identified problems. (Reference-Title 25, § 71.21.a.4.ii.D)
	N/A	4. The need for new community sewage systems. (Reference-Title 25, § 71.21.a.4.iii)
	N/A	5. The construction of new wastewater treatment facilities. (Reference-Title 25, § 71.21.a.4.iii)
	Sect. 6.2	6. Repair or replacement of collection and conveyance system components. (Reference-Title 25, § 71.21.a.4.ii.A)
	N/A	7. Use of alternative methods of collection/conveyance to serve needs areas using existing wastewater treatment facilities. (Reference-Title 25, § 71.21.a.4.ii.B)

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		8. The continual and future use of individual and community subsurface sewage disposal system alternatives based on:
	Sect. 3.1.2, 4.1.2	a. Soil suitability. (Reference-Title 25, § 71.21.a.2.ii.C)
	Sect. 3.1.2, 4.1.2	b. Preliminary hydrogeological evaluation. (Reference-Title 25, § 71.21.a.2.ii.C)
	Sect. 4.1.4	c. The establishment of a sewage management program. (Reference-Title 25, § 71.21.a.4.iv)
		9. The repair, replacement or upgrading of existing malfunctioning systems in areas suitable for on-lot disposal considering: (Reference-Title 25, § 71.21.a.4)
	Sect. 4.1.3	a. Existing technology and sizing requirements of Title 25 Chapter 73. (Reference-Title 25, § 73.31 - 73.72)
	Sect. 4.1.2.3, 4.1.2.4	b. Use of expanded absorption areas or alternating absorption areas. (Reference-Title 25, § 73.16)
	Sect. 4.1.3	c. Use of water conservation devices. (Reference-Title 25, § 71.73.b.2.iii)
		10. The use of small flow sewage treatment facilities, land treatment alternatives, or package treatment facilities to serve individual homes or clusters of homes based on: (Reference-Title 25, § 71.21.a.4)
	N/A	a. Discharge Requirements. (Reference-Title 25, § 71.64.d)
	N/A	b. Soil Suitability. (Reference-Title 25, § 71.64.c.1)
	N/A	c. Preliminary Hydrogeologic Evaluation. (Reference-Title 25, § 71.64.c.3)
	N/A	d. Agency or other controls over operation and maintenance requirements. (Reference-Title 25, § 71.64.d)
		11. The use of retaining tank alternatives including: (Reference-Title 25, § 71.21.a.4)
	N/A	a. Commercial, residential and industrial use. (Reference-Title 25, § 71.63.a)
	N/A	b. Designated conveyance facilities (pumper trucks). (Reference-Title 25, § 71.63.b.2)
	N/A	c. Designated treatment facilities or disposal site. (Reference-Title 25, § 71.63.b.2)
	N/A	d. Implementation of a retaining tank ordinance by the municipality. (Reference-Title 25, § 71.63.c.3)
	N/A	e. Financial guarantees when retaining tanks are used as an interim sewage disposal measure. (Reference-Title 25, § 71.63.c.2)
	N/A	f. Temporary or permanent use.

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	12. A no-action alternative which includes both short-term and long-term impacts on: (Reference-Title 25, § 71.21.a.4)
N/A	a. Water Quality/Public Health. (Reference-Title 25, § 71.21.a.4)
N/A	b. Growth potential (residential, commercial, industrial). (Reference-Title 25, § 71.21.a.4)
N/A	c. Community economic conditions. (Reference-Title 25, § 71.21.a.4)
N/A	d. Recreational opportunities. (Reference-Title 25, § 71.21.a.4)
N/A	e. Drinking water sources. (Reference-Title 25, § 71.21.a.4)
N/A	f. Other environmental concerns. (Reference-Title 25, § 71.21.a.4)
	13. Discuss the need for and implementation of a sewage management program to assure the future operation and maintenance of existing and proposed sewage facilities through:
Sect. 7.2.1	a. Municipal ownership or other management control over the operation and maintenance of individual on-lot sewage disposal systems, small flow treatment facilities, or other non- municipal treatment facilities. (Reference-Title 25, § 71.21.a.4.iv)
Sect. 7.2.1	b. Requiring scheduled inspection of on-lot sewage disposal systems. (Reference-Title 25, § 71.73.b.1)
Sect. 7.2.1	c. Requiring scheduled maintenance of septic and aerobic treatment tanks and associated system components. (Reference-Title 25, § 71.73.b.2)
Sect. 7.2.1	d. Aggressive enforcement of ordinances which require operation and maintenance and prohibit malfunctioning systems. (Reference-Title 25, § 71.73.b.5)
Sect. 4.1, 7.2.1	e. Repair, replacement or upgrading of malfunctioning on-lot sewage systems. (Reference-Title 25, § 71.21.a.4.iv)
N/A	f. Establishment of joint municipal sewage management programs. (Reference-Title 25, § 71.73.b.8)
Sect. 7.2.1	g. Reduction of organic or hydraulic loading to existing wastewater treatment facilities. (Reference-Title 25, § 71.71)
Sect. 7.2.1	h. Requirements for bonding, escrow accounts, management agencies or associations to assure proper operation and maintenance for non-municipal facilities. (Reference-Title 25, § 71.71)
	14. Non-structural comprehensive planning alternatives that can be undertaken to assist in meeting existing and future sewage disposal needs including: (Reference-Title 25, § 71.21.a.4)
	a. Modification of existing comprehensive plans involving:
Sect. 2.5.3	1. Land use designations. (Reference-Title 25, § 71.21.a.4)

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	Sect. 2.5.3	2. Densities. (Reference-Title 25, § 71.21.a.4)
	Sect. 2.5.3	3. Municipal ordinances and regulations. (Reference-Title 25, § 71.21.a.4)
	Sect. 2.5.3	4. Improved enforcement. (Reference-Title 25, § 71.21.a.4)
	Sect. 2.5.3	5. Protection of drinking water sources. (Reference-Title 25, § 71.21.a.4)
	Sect. 2.5.3	b. Need for a comprehensive plan to assist in producing sound economic and consistent land development. (Reference-Title 25, § 71.21.a.4)
	Sect. 2.5.3	c. Alternatives for creating or changing municipal subdivision regulations to assure long-term use of on-site sewage disposal. (Reference-Title 25, § 71.21.a.4)
	N/A	d. Evaluation of existing local agency programs and the need for technical or administrative training. (Reference-Title 25, § 71.21.a.4)

VI. The Evaluation of Alternatives

A. Each technically feasible alternative identified in Section V of this check-list must be evaluated for consistency with respect to the following: (Reference-Title 25, § 71.21.a.5.i)

	N/A	1. Applicable plans developed and approved under Sections 4 and 5 of the Clean Streams Law or Section 208 of the Clean Water Act (33 U.S.C.A. 1288). (Reference-Title 25, § 71.21.a.5.i.A) Appendix B, Section II.A.
	N/A	2. Municipal wasteload management plans developed under PA Code, Title 25, Chapter 94. (Reference-Title 25, § 71.21.a.5.i.B) The municipality's recent Wasteload Management (Chapter 94) Reports should be examined to determine if the proposed alternative is consistent with the recommendations and findings of the report. (Appendix B, Section II.B.
	N/A	3. Plans developed under Title II of the Clean Water Act (33 U.S.C.A. 1281-1299) or Titles II and VI of the Water Quality Act of 1987 (33 U.S.C.A. 1251-1376). (Reference-Title 25, § 71.21.a.5.i.C) Appendix B, Section II.E.
	N/A	4. Comprehensive plans developed under the Pennsylvania Municipalities Planning Code. (Reference-Title 25, § 71.21.a.5.i.D) The municipality's comprehensive plan must be examined to assure that the proposed wastewater disposal alternative is consistent with land use and all other requirements stated in the comprehensive plan. Appendix B, Section II, D.
	N/A	5. Antidegradation requirements as contained in PA Code, Title 25, Chapters 93, 95 and 102 (relating to water quality standards, wastewater treatment requirements and erosion control) and the Clean Water Act. (Reference-Title 25, § 71.21.a.5.i.E) Appendix B, Section II, F.
	N/A	6. State water plans developed under the Water Resources Planning Act (42 U.S.C.A. 1962-1962 d-18). (Reference-Title 25, § 71.21.a.5.i.F) Appendix B, Section II, C.

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	N/A	7. Pennsylvania Prime Agricultural Land Policy contained in Title 4 of the Pennsylvania Code, Chapter 7, Subchapter W. Provide narrative on local municipal policy and an overlay map on prime agricultural soils. (Reference-Title 25, § 71.21.a.5.i.G) Appendix B Section II.G.
	N/A	8. County Stormwater Management Plans approved by the Department under the Storm Water Management Act (32 P.S. 680.1-680.17). (Reference-Title 25, § 71.21.a.5.i.H) Conflicts created by the implementation of the proposed wastewater alternative and the existing recommendations for the management of stormwater in the County Stormwater Management Plan must be evaluated and mitigated. If no plan exists, no conflict exists. Appendix B, Section II.H.
	N/A	9. Wetland Protection under PA Code, Title 25, Chapter 105. Map wetland areas using Federal National Wetlands Inventory Mapping and Soils Mapping. (Reference-Title 25, § 71.21.a.5.i.I) Identify and provide mitigative measures for any encroachments on wetlands from the construction or operation of any wastewater facilities proposed by the alternative. Appendix B, Section II.I.
	N/A	10. Protection of rare, endangered or threatened plant and animal species as identified by the Pennsylvania National Diversity Inventory (PNDI). (Reference-Title 25, § 71.21.a.5.i.J) Provide the Department with a copy of the completed Request For PNDI Search document. Also provide a copy of the response letter from the Department's Bureau of Forestry regarding the findings of the PNDI search. Appendix II. J.
	N/A	11. Historical and Archaeological Resource Protection under P.C.S. Title 37, Section 507 relating to cooperation by public officials with the Pennsylvania Historical and Museum Commission. (Reference-Title 25, § 71.21.a.5.i.K) Provide the Department with a completed copy of Form "A" and its attachments requesting the Bureau of Historic Preservation (BHP) to provide a listing of known historical sites and potential impacts on known archaeological and historical sites. Also provide a copy of the response letter from the BHP. Appendix B, Section II. K.
	Appendix P	B. Provide for the resolution of any inconsistencies in any of the points identified in Section VI.A. of this checklist by submitting written documentation that the appropriate agency has received, reviewed, and concurred with the method proposed to resolve identified inconsistencies. (Reference-Title 25, § 71.21.a.5.ii) Appendix B
	N/A	C. Evaluate each alternative identified in Section V of this checklist with respect to applicable water quality standards, effluent limitations or other technical, legislative or legal requirements. (Reference-Title 25, § 71.21.a.5.iii)
	N/A	D. Provide cost estimates using present worth analysis for construction, financing, ongoing administration, operation and maintenance and user fees for each alternative identified in Section V of this checklist. Estimates shall be limited to areas identified in the plan as needing improved sewage facilities within 5 years from the date of plan submission. (Reference-Title 25, § 71.21.a.5.iv)
	Sect. 7.3	E. Provide an analysis of the funding methods available to finance each of the proposed alternatives evaluated in Section V of this checklist. Also provide documentation to demonstrate which alternative and financing scheme combination is the most cost-effective; and a contingency financial plan to be used if the preferred method of financing cannot be implemented. The funding analysis shall be limited to areas identified in the plan as needing improved sewage facilities within five years from the date of the plan submission. (Reference-Title 25, § 71.21.a.5.v)

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	N/A	F. Analyze the ability of the municipality to implement each alternative proposed in Section V of this report including: (Reference-Title 25, § 71.21.a.5.vi)
	N/A	1. The activities necessary to abate critical public health hazards pending completion of sewage facilities or sewage management programs. (Reference-Title 25, § 71.21.a.5.vi.A)
	N/A	2. The phased development of the facilities or sewage management program. (Reference-Title 25, § 71.21.a.5.vi.B)
	N/A	a. Provide time schedules for implementing each phase. (Reference-Title 25, § 71.21.a.5.vi.C)
	N/A	3. The administrative organization and legal authority necessary for plan implementation. (Reference-Title 25, § 71.21.a.5.vi.D)
		VII. Institutional Evaluation
		A. Provide an analysis of all existing wastewater treatment authorities, their past actions and present performance including:
	Sect. 7.3.2	1. Financial & debt status. (Reference-Title 25, § 71.61.d.2.)
	Sect. 7.3.1	2. Available staff and administrative resources. (Reference-Title 25, § 71.61.d.2.)
	Sect. 7.3.1	3. Existing legal authority to:
	Sect. 7.3.1	a. Implement wastewater planning recommendations. (Reference-Title 25, § 71.61.d.2.)
	Sect. 7.3.1	b. Implement system-wide operation and maintenance activities. (Reference-Title 25, § 71.61.d.2.)
	Sect. 7.3.1	c. Set user fees and take purchasing actions. (Reference-Title 25, § 71.61.d.2.)
	Sect. 7.3.1	d. Take actions against adopted ordinance violators. (Reference-Title 25, § 71.61.d.2.)
	Sect. 7.3.1	e. Negotiate agreements with other parties. (Reference-Title 25, § 71.61.d.2.)
	Sect. 7.3.1	f. Raise capital for construction and operation and maintenance of facilities. (Reference-Title 25, § 71.61.d.2.)
		B. Provide an analysis and description of the various institutional alternatives necessary to implement the proposed alternative including:
	N/A	1. Need for new authorities. (Reference-Title 25, § 71.61.d.2.)
	Sect. 7.3	2. Functions of existing and proposed organizations (sewer authorities, etc.). (Reference-Title 25, § 71.61.d.2.)
	N/A	3. Cost of administration, implementability, and the capability of the authority to react to future needs. (Reference-Title 25, § 71.61.d.2.)

C. Describe all necessary administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternative including:

Sect. 2.4.4 — 1. All legal authorities of incorporation. (Reference-Title 25, § 71.61.d.2.)

Sect. 2.4.4, 3.2.2 — 2. All required ordinances, regulations, standards, and inter-municipal agreements. (Reference-Title 25, § 71.61.d.2.)

N/A — 3. Activities to provide rights-of-way, easements, and land transfers. (Reference-Title 25, § 71.61.d.2.)

N/A — 4. Other municipal sewage facilities plan adoptions. (Include the development of Items 1-4 on the project's schedule of implementation). (Reference-Title 25, § 71.61.d.2.)

N/A — 5. Any other legal documents. (Reference-Title 25, § 71.61.d.2.)

Sect. 7.1 — D. Identify the chosen institutional alternative for implementing the chosen wastewater disposal alternative. Provide justification for choosing the specific alternative. (Reference-Title 25, § 71.61.d.2.)

VIII. Selected Wastewater Treatment & Institutional Alternatives

A. Select one technical wastewater disposal alternative which best meets the wastewater treatment needs of each area of the municipality studied. Justify the choices by providing documentation which shows that they are the best alternative(s) based on:

Sect. 7.2 — 1. Wastewater disposal needs. (Reference-Title 25, § 71.21.a.6.)

Sect. 7.3 — 2. Technical and administrative needs. (Reference-Title 25, § 71.21.a.6.)

N/A — 3. Cost-effectiveness. (Reference-Title 25, § 71.21.a.6.)

Sect. 7.3 — 4. Management and administration systems available. (Reference-Title 25, § 71.21.a.6.)

Sect. 7.3 — 5. Financing methods available. (Reference-Title 25, § 71.21.a.6.)

Sect. 5.2, 5.3, 7.2 — 6. 5 and 10 year planned growth areas. (Reference-Title 25, § 71.21.a.6.)

N/A — 7. Environmental soundness and compliance with natural resource planning and preservation programs. (Reference-Title 25, § 71.21.a.6.)

Sect. 7.3 — B. Describe the capital financing plan chosen to implement the selected alternative(s).