CBP/TRS 8593
February 4, 1993

1985 Baseline Point Source Load Inventory

1991 Reevaluation Report No. 2

Chesapeake Bay Program

Printed on recycled paper

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Report No. 2

Produced under contract to the U.S. Environmental Protection Agency
Contract No. 68-WO-0043

Printed by the U.S. Environmental Protection Agency for the Chesapeake Bay Program

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Table of Contents

Page

EXECUTIVE SUMMARY iii

I. Background 1

II. Purpose 1

III. Estimation of Municipal and Industrial Point Source Loads by State 1

A. Maryland 1

B. Virginia 5

C. Pennsylvania 7

D. District of Columbia 8

IV. Point Sources Not Covered in the 1985 Baseline 9

A. Bypasses 9

B. Combined Sewer Overflows 11

C. Stormwater 14

V. References 18

VI. Appendix I 1985 Plant Loadings 19

EXECUTIVE SUMMARY

This report is one in a series of reports produced as part of the 1987 Bay Agreement Commitment to re-evaluate the 40% nutrient reduction goal.

It finalizes and documents the Chesapeake Bay Agreement states' 1985 point source nutrient load estimates initially presented in the "Baywide Nutrient Reduction Strategy" (BNRS). The Bay Agreement states include Maryland, Virginia, Pennsylvania, and the District of Columbia.

It also documents progress towards the point source nutrient reduction goal and includes 1985 point source nutrient load estimates for non-Chesapeake Bay Agreement states including New York, West Virginia and Delaware.

Each of the states' final, annual, discharged, 1985 point source total phosphorus and total nitrogen nutrient load estimates are presented in Table 1. These estimates are to serve as the point source baseline for the year 2000 40% nutrient reduction goal. Facility by facility flows, nutrient concentrations and nutrient loads for 1985 from above the fall line (AFL) and from below the fall line (BFL) are presented in Appendix I.

Table 2 presents the percent change in the 1985 baseline loads for each of the Bay agreement states relative to 1991. Estimates of 1991 nutrient loads are not available for non-agreement states at this time.

Both Maryland and Virginia have achieved a 40% reduction in their total phosphorus loads and have made some progress towards reducing total nitrogen loads. Pennsylvania and the District of Columbia have made very significant progress towards the 40% total phosphorus reduction goal, but have not yet achieved it. The District of Columbia had a slight decrease in its total nitrogen load, while the Pennsylvania total nitrogen load has increased.

There are significant differences between the estimates presented in Table 1 and the initial estimates presented in the BNRS. These differences are due to:

- using discharged or "end-of-pipe" loads for above the fall line dischargers in Virginia and Pennsylvania;
- re-allocating a portion of the Blue Plains STP nutrient load from the District of Columbia to Maryland; and
- refining estimates of point source effluent concentrations for several Maryland municipal and industrial dischargers.

TABLE 1. DISCHARGED STATE 1985 POINT SOURCE NUTRIENT BASELINE LOADS (LBS/YEAR)

TOTAL PHOSPHORUS

STATE	AFL	BFL	TOTAL
Bay Agreement states			
Maryland	861,158	1,851,581	2,712,739
Virginia	1,162,559	4,015,479	5,178,038
Pennsylvania	3,548,497	-0-	3,548,497
District of Col.	-0-	107,735	107,735
SUBTOTAL	5,572,214	5,974,795	11,547,009
Non-Bay Agreement states			
New York	1,212,065	-0-	1,212,065
West Virginia	93,845	-0-	93,845
Delaware	-0-	36,840	36,840
	1,305,910	36,840	1,342,750
TOTAL	6,878,124	6,011,635	12,889,759

TOTAL NITROGEN

STATE	AFL	BFL	TOTAL
Bay Agreement states			
Maryland	3,609,579	28,920,053	32,529,632
Virginia	5,218,586	31,290,989	36,509,575
Pennsylvania	14,339,441	-	14,339,441
District of Col.	-	8,560,430	8,560,430
SUBTOTAL	23,167,606	68,771,472	91,939,078
Non-Bay Agreement States			
New York	4,343,080	-	4,343,080
West Virginia	231,433	-	231,433
Delaware	-	86,759	86,759
SUBTOTAL	4,574,513	86,759	4,661,272
TOTAL	27,742,119	68,858,231	96,600,350

TABLE 2. ESTIMATED PERCENT REDUCTIONS IN DISCHARGED STATE 1985 POINT SOURCE NUTRIENT BASELINE LOADS, RELATIVE TO 1991

STATE	TOTAL PHOSPHORUS TOTAL
Maryland	-50
Virginia	-44
Pennsylvania (1)	-29
District of Col.	-37
New York (2)	N/A
West Virginia (2)	N/A
Delaware (2)	N/A

STATE	TOTAL NITROGEN TOTAL
Maryland	-19
Virginia	- 7
Pennsylvania (1)	+22
District of Col.	- 4
New York (2)	N/A
West Virginia (2)	N/A
Delaware (2)	N/A

(1) Based on 1990 data
(2) Data not available
NA = Not Available

The load estimates presented in the BNRS are loads delivered to the fall line and represent discharged loads that have been reduced through chemical and physical transformations as they are transported from the "end-of-pipe" to the fall line. The final AFL nutrient load estimates presented here for Virginia and Pennsylvania point sources appear greater than those in the BNRS because they represent discharged or "end-of-pipe" loads. This significantly increases the load estimates from Pennsylvania which is located above the fall line. Specifically, phosphorus and nitrogen benchmark loads increase 227% and 104% respectively.

There is no change in the District of Columbia's point source nutrient load estimates from confirmed sewer overflows (CSOs). The total nitrogen load from Blue Plains increases 0.4% and the total phosphorus load increases 3.9% due to the slightly increased nutrient effluent concentrations.

Another factor for the differences in the state loads presented in Table 1 and those in the BNRS is re-allocation of the nutrient load from the District of Columbia's Blue Plains STP. The Blue Plains STP is a regional wastewater treatment plant located in the District of Columbia that treats and discharges municipal waste generated in the District and surrounding Maryland and Virginia suburbs. The revised estimates presented in Table 1 re-assigns 5,640,900 pounds of nitrogen and 47,423 pounds of phosphorus from the District of Columbia's annual nutrient load to Maryland's to reflect that state's contribution of 119 MGD of wastewater to Blue Plains for treatment. The contribution from Virginia is much smaller and not re-assigned.

Distinct from the increased loads resulting from re-allocation of the Blue Plains nutrient load, Maryland nitrogen and phosphorus load estimates presented in Table 1 are 3% greater and 14% less, respectively, than the estimates presented in the BNRS. The increase in Maryland's baseline nitrogen load estimate results from revised estimates of industrial nitrogen loads. The decrease in the phosphorus load estimate results from reduced effluent concentrations at three municipal plants and one industrial plant.

The report examines sources not included in the BNRS such as combined sewer overflows (CSOs), bypasses and stormwater. The report concludes that, with the exception of the District of Columbia, inadequate data is available to characterize 1985 CSO nutrient loads and recommends that municipalities with CSOs characterize their nutrient loads and report progress in controlling them through the annual BNRS progress reports. A similar conclusion and recommendation is reached regarding bypasses but without the District of Columbia exclusion. Estimates of stormwater nutrient loads, as developed for urban land use by the watershed model are not included here but presented in Report #1 of the 1991 Re-evaluation, "Nonpoint Source Nutrient Load Inventory." The report summarizes the Clean Water Act of 1987 requirements for stormwater control and identifies the jurisdictions subject to the requirements.

The report documents each state's methodology to estimate nutrient loads from industrial and municipal sources and recommends continued development and implementation of nutrient monitoring and centralized reporting.

1985 Baseline
Point Source Load Inventory

I. Background

This report is one in a series of reports produced as part of the 1991 Reevaluation of the 40% nutrient reduction goal established by the Chesapeake Bay Agreement of 1987. It finalizes the states' 1985 point source nutrient load estimates initially presented in the "Baywide Nutrient Reduction Strategy" (BNRS) and used as the baseline for the 40% reduction.

The BNRS (Chesapeake Executive Council, 1988) establishes 1985 baseline nutrient loading estimates for point and nonpoint sources for Maryland, Pennsylvania, Virginia and the District of Columbia. Estimates of point source nutrient loads for New York, West Virginia, and Delaware were not included in the BNRS but are included here to provide a total accounting of point source loads basinwide.

II. Purpose

The major purpose of this report is to revisit the 1985 municipal and industrial point source loadings used in the BNRS and to confirm or modify these loadings based on more recent and more accurate estimates. In addition, this report documents each state's methodologies for estimating 1985 point source loads, documents progress towards the nutrient reduction goal through 1991 and considers point sources not covered in 1985 point source load estimates including: combined sewer overflows (CSOs), stormwater, and bypasses at municipal plants. Appendix I presents the individual facility annual flows and nutrient loads that serve as the 1985 point source baseline. Assignment of discharges to model segment, the actual loading by segment input to the watershed and time variable 3-D water quality models and delivery ratios for each model segment are included in the model documentation (Donigian, et al 1992).

III. Estimation of Municipal and Industrial Point Source Loads by State

A. MARYLAND. The 1985 Maryland nutrient load estimates provided in this report were extracted from a comprehensive data set of Maryland point source dischargers covering the time period 1984 to 1989 (Legg 1991).

1. **Scope.** The total average daily flows incorporated in Maryland's point source load estimate for 1985 are majors 357 MGD; minors 19 MGD; and industrials 191 MGD. Maryland municipal plants are divided into "major" and "minor" categories. A major municipal plant is defined as one having a discharge flow of 0.5 million gallons per day (MGD) or greater.

The number of municipal and industrial discharges included in the analysis for 1985 are majors 43; minors 239; and industrials 19.

a. **Municipal.** Maryland municipal point source load estimates include all sewage treatment plants (STPs) AFL or BFL discharging more than 1,000 gallons per day (0.001 MGD). Maryland also includes in the 1985 baseline 120 MGD of wastewater discharged by the Blue Plains STP, located in the District of Columbia, which treats and discharges waste generated in Maryland and Virginia suburbs surrounding the District. In Maryland, this amounts to 130 pounds of total phosphorus and 15,455 pounds of total nitrogen discharged daily. In this report, the Blue Plains nutrient loads will be allocated between Maryland and the District of Columbia based on their contribution of wastewater; nutrient loads from Virginia suburbs are relatively minor and are not allocated to the Virginia 1985 baseline.

The municipal flows from major and minor municipal facilities included in this load estimate represent greater than 99% of the total municipal flow entering the Chesapeake Bay from Maryland municipal STPs. Thus, by excluding municipal STPs which discharge less than 0.001 MGD, the estimation of total point source nutrient loads was not significantly affected.

b. **Industrial.** Maryland industrial point source load estimates include industries identified by the Industrial Discharge Program, Maryland Department of the Environment (MDE), that discharge significant amounts of phosphorus and/or nitrogen to the Chesapeake Bay.

2. **Methodology.** In 1988, the Permits Division, Water Management Administration, MDE, adopted a policy that any new or renewed permits for STPs discharging more than 0.5 MGD require the reporting of ammonia, total Kjeldahl nitrogen, nitrate, orthophosphate and total phosphorus on discharge monitoring reports (DMRs). Most "major" wastewater treatment plants now have monitoring requirements for nutrients. Secondary data sources and methods used to generate the loading estimates in the absence of DMR data are discussed in the next section.

a. Municipal:

1) Flow. Monthly average flow values were obtained from the DMRs for the major STPs. For the minor STPs, flow values were obtained from either the DMRs or flow allocation tables. Plants discharging an average of 0.001 MGD or greater were included. If some values were missing, the monthly operating report (MOR) was used. The MOR provides a daily record of a plant's performance. Its purpose is to allow the inspectors in the Division of Municipal Compliance, MDE, to verify the values listed in the DMR. When a monthly value was not available on either the DMR or the MOR, an annual average was used. If an entire year was missing, the average flow from the previous year was used.

2) Nutrient Concentrations. Nutrient concentrations were taken from DMRs of major STPs whenever possible. However, many of these plants only have seasonal permit limits (i.e., 4/1 to 10/31) for total nitrogen (TN) and total phosphorus (TP). While the DMR would only have TN and TP concentrations for those months, the MOR often had data for the entire year. Others had no permit limits and no DMR data; however, the MOR did contain nutrient data. If some monthly values were missing, the annual average was used.

The Compliance Monitoring Report (CMR) was used if there was not enough data on the DMR or the MOR. The CMR is a listing of laboratory results generated by periodic grab samples taken at STPs throughout the state. The number of plants sampled and the frequency of sampling varies greatly. Some plants have a considerable amount of nutrient data reported on the CMRs while others have none. As with DMR data, the annual average of CMR values was used to fill in missing monthly values. Combining DMR and CMR data values was avoided.

If nutrient information was not available from any data source, default values for TN and TP were used. The default value for TN was 18 mg/l. The default value for phosphorus was 7 mg/l for the years 1984 and 1985 (prior to the phosphate ban in Maryland), and 3 mg/l for all remaining years (following enactment of the phosphate ban).

b. Industrial:

1) Flow. The Industrial Discharge Program, MDE, provided a listing of the major industrial discharges contributing nutrients to the Chesapeake Bay and its tributaries. For these industries, monthly average flow values were taken from the DMRs. If monthly values were missing, annual averages were used. If the entire year was missing, the average flow from the previous year was used.

2) Nutrient Concentrations. Most NPDES permits for industries do not include limits on the amount of nutrients they may discharge and consequently they are not required to report TN

and TP on the DMRs. Because of this, the main sources of 1985 nutrient data were the permit applications. Permits are renewed every five years and each time an industry applies for a new permit it must perform a sample analysis of its effluent. Like DMRs, testing is done with grab samples. They are not as representative of effluent quality as composite samples but they are the best data available. Many industries now have nutrient monitoring and reporting requirements.

3. Comparison to Initial Nutrient Estimates Included in the Baywide Nutrient Reduction Strategy (BNRS)

a. Nitrogen The revised estimate of Maryland's 1985 point source TN loading (89,122 lbs/day) is 1% less than the initial estimate (90,000 lbs/day) included in the BNRS. The difference between the revised and initial nitrogen load estimates for the major and minor municipal plants, is very small (54,890 vs. 54,870 lbs/day respectively). The revised nitrogen load from industrial plants is approximately 4% lower (35,560 vs. 34,250 lbs/day respectively) than the initial estimate and accounts for nearly all of the difference between the revised and initial estimates.

Table A specifically accounts for the differences in industrial nitrogen load estimates:

TABLE A - DIFFERENCES IN INDUSTRIAL TN ESTIMATES

Initial Estimates Included in Baywide Nutrient Red. Strategy		Revised Estimates Developed for 1991 Reevaluation	
TN Load (lbs/day)	Plant	TN Load (lbs/day)	Plant
Bethlehem Steel	20,780	Bethlehem Steel	21,970
W.R. Grace	10,000	W.R. Grace	9,050
W.D. Byron	1,120	W.D. Byron	310
Eastern Stainless	1,000	Eastern Stainless	190
Chemetals	800	Chemetals	880
Indian Head NOS	690	Indian Head NOS	700
Mineral Pigments	420	Mineral Pigments	520
Up. Pot. Riv. Com.	60	Up. Pot. Riv. Com.	570
Westvaco	60	Westvaco	60
Others	630		
TOTAL	35,560	**TOTAL**	34,250

b. Phosphorus. The revised estimate of Maryland's 1985 point source TP loading (7430 lbs/day) is 17% less than the original estimate (9000 lbs/day) included in the BNRS. Three major municipal plants and one industrial facility account for 94% of the difference in the revised and initial phosphorus load estimates.

The three major municipal plants account for approximately 350 lbs/day of the difference in the TP load estimates and the one industrial facility, Bethlehem Steel, accounts for about 1120 lbs/day difference.

Table B presents the effluent concentrations and resultant phosphorus loadings for these four plants.

TABLE B - INITIAL AND REVISED TP EFFLUENT CONCENTRATION AND LOADINGS

	Concentration (mg/l)		Loading (lbs/day)	
Plant	Initial	Revised	Initial	Revised
Annapolis	6.0	2.7	310	140
Cox Creek	3.0	1.8	230	140
Hagerstown	6.3	4.4	310	220
Bethlehem Steel	1.8	0.3	1500	380
Total			2350	880

The different effluent phosphorus concentrations used in the initial and revised estimates for Bethlehem Steel account for the more than half of the difference between the initial and revised estimates. The revised effluent phosphorus concentrations were determined from a thorough examination of all available data and, therefore, form a better estimate of the actual loadings.

B. VIRGINIA

1. Scope:

a. Municipal. Virginia includes in its 1985 base-line, municipal discharges AFL with a design flow $\geq$ 0.5 MGD and all publicly owned treatment works BFL, regardless of design capacity. The remaining plants account for a relatively small percentage of the total volume of municipal wastewater discharged and are not included in the 1985 baseline.

b. Industrial. Virginia industrial point source load estimates include industries with "significant" nutrient loads (equivalent to, or greater than, the load from a 0.5 MGD POTW for either nitrogen or phosphorus).

The number of municipal and industrial discharges included in the analysis for 1985 are majors 50, minors 24, and industrial 23.

2. Methodology

a. Municipal:

1) Flow. Municipal flows are the average of the 12 monthly averages during 1985, submitted in discharge monitoring reports (DMRs).

2) Nutrient Concentrations. Municipal nutrient concentrations are either the average of reported values or flow-weighted default values computed using data from the Hampton Roads Sanitation District (HRSD) and the upper James River plants. Sources of reported values include discharge monitoring reports (DMRs), owner-generated data, compliance monitoring, or special studies. The municipal nutrient default values based on the data for HRSD and upper James plants are 6.4 mg/l for phosphorus and 18.7 mg/l for nitrogen.

b. Industrial:

1) Flow. Industrial flows are the average of the 12 monthly averages during 1985, submitted in DMRs.

2) Nutrient Concentrations. Industrial nutrient concentrations are from a variety of sources, including Voluntary Nutrient Monitoring Program (VNMP), DMRs, Virginia Water Control Board (VWCB) or owner-generated data (wasteload allocation, compliance monitoring), and permit applications. No default values were assigned for industrial nutrient concentrations.

The VNMP was started to assess the effectiveness of the Virginia Phosphate Detergent Ban effective January, 1988. Both municipal and industrial plants in the Bay drainage area were asked to report the effluent phosphorus and nitrogen data (broken down by ammonia, TKN, nitrites, and nitrates if possible). Once per month, 24-hour composite samples were requested, with use of an EPA approved analytical procedure to measure concentrations. The response from the owners was very encouraging, with 31 municipal and 17 industrial plants participating in the VNMP by summer 1988.

The VNMP is currently being phased out and replaced by mandatory effluent monitoring requirements. Since adopting the Point Source Policy for Nutrient Enriched Waters in March 1988, the VWCB has been modifying the permits of affected plants to include a 2 mg/l limit on phosphorus along with a nitrogen monitoring provision. This data will be submitted by the owners as part of their monthly DMR.

3. Comparison to Initial Nutrient Estimates Included in the Baywide Nutrient Reduction Strategy (BNRS)

The revised AFL load estimates included in this report are discharged "end-of-pipe" loads and are not comparable to the original

AFL estimates. AFL point source load estimates initially included in the BNRS for Virginia were based on delivery to the fall line. The delivery ratios used to account for reductions in the discharged load as it was transported to the fall line were those cited in the Chesapeake Bay Program 1983 report, Framework for Action. It is possible, however, to compare the BFL nutrient load estimates because no delivery ratios were applied and the initial and revised estimates are for "end of pipe" or discharged loads.

a. Phosphorus. The net change in the BFL municipal and industrial TP load is about one-quarter of 1%. There is no change between the initial and revised BFL municipal TP load, it remains at 3.42 million pounds/year. The revised BFL industrial TP load increased about 2% from 0.59 to .60 million pounds/year.

b. Nitrogen. The net change in the municipal and industrial BFL TN load is about one quarter of 1%. There is no change between the initial and revised municipal TN load, it remains at 24.8 million pounds/year. The industrial TN load BFL increases 1% from 6.48 to 6.56 million pounds/year.

C. PENNSYLVANIA

1. Scope

a. Municipal. Pennsylvania municipal point source load estimates include all AFL STPs with design capacity $\geq$ 0.5 MGD. No municipal discharges in Pennsylvania are located BFL.

b. Industrial. Pennsylvania industrial point source load estimates include industries with "significant" nutrient loads (equivalent to or greater than the load from a 0.5 MGD municipal treatment plant for either nitrogen or phosphorus).

The number of municipal and industrial discharges included in the analysis for 1985 are majors 80, minors 34, and industrials 17.

2. Methodology

a. Municipal. The point source baseline loads included in the BNRS for Pennsylvania were developed using 1985 NPDES permit and discharge monitoring report data (DMRs). Where no actual data existed, default values for municipal effluent were assigned. For nitrogen, the default value used was 20.9 mg/l; for phosphorus, default values of 6.5, 8.0 and 9.5 mg/l were used based on level of treatment and best engineering judgement of Pennsylvania Department of Environmental Resources (PA DER) staff.

b. Industrial. Pennsylvania industrial point source nutrient load estimates were developed using 1985 NPDES permit and DMR data.

3. Comparison to Initial Nutrient Estimates Included in the Baywide Nutrient Reduction Strategy (BNRS)

The revised AFL load estimates included in this report are discharged "end-of-pipe" loads and are not comparable to the original AFL estimates. AFL point source load estimates initially included in the BNRS for Pennsylvania discharges were based on delivery to the fall line. The delivery ratios that were used were those cited in the 1983 Chesapeake Bay Program report, Framework for Action.

D. DISTRICT OF COLUMBIA

1. Scope. Nutrient load estimates cited in the BNRS for the District of Columbia include municipal point sources, urban stormwater runoff and combined sewer overflows. No industrial point sources are included.

District of Columbia municipal nutrient load estimates are represented totally by the Blue Plains Wastewater Treatment Plant.

The Blue Plains STP treats and discharges wastewater generated in the District of Columbia and surrounding suburbs located in Maryland and Virginia. Maryland includes the nutrient load of 120 MGD of wastewater generated by Maryland suburbs and treated and discharged by Blue Plains in its 1985 baseline nutrient load estimates. The contribution from Virginia suburbs is relatively minor and is accounted for in the District of Columbia 1985 baseline nutrient load estimates.

a. Phosphorus. The net change in the Blue Plains municipal total phosphorus load is 0.4% due to the slightly increased TP effluent concentration estimates (0.13 vs. 0.12 mg/l).

b. Nitrogen. The net change in the Blue Plains municipal total nitrogen load is 3.9% due to slightly increased TN effluent concentration estimates (15.46 vs. 15.39 mg/l).

Although stormwater runoff and CSOs are dependent upon rainfall and are more closely aligned with nonpoint sources, the Clean Water Act of 1987 defines them as point sources requiring NPDES permits. In defining the 1985 baseline, however, the stormwater nutrient load estimates are included in the nonpoint source contribution and cited in Report #1 of the 1991 Reevaluation entitled, "Nonpoint Source Load Inventory." These stormwater nutrient load estimates are based on the watershed model estimates of nutrient runoff from urban lands.

2. Methodology:

a. **Municipal Point Sources.** The loadings for Blue Plains were calculated from the discharge monitoring reports for 1985.

They represent a flow of 298.469 MGD at 15.46 mg/l nitrogen and 0.13 mg/l phosphorus. Blue Plains is a regional treatment facility serving the District of Columbia and portions of Maryland and Virginia.

Approximately 44% of the volume of wastewater treated and discharged by Blue Plains is contributed by surrounding jurisdictions in Maryland (40%) and Virginia (4%). Maryland's 1985 baseline includes its contribution to the Blue Plains loading. Virginia's baseline, however, does not.

b. Combined Sewer Overflows. In the District, 12,716 acres are served by combined sewer systems and 27,430 acres are served by separate sewer systems. CSO loadings were calculated from overflow volumes (2,525 mg/y) and average nutrient concentrations (TP=1.75 mg/l and TN=7.94 mg/l). No attempt was made to account for the first flush concentrations. Significant remedial measures are being implemented to address the CSO problem in the District of Columbia.

c. Stormwater Runoff. Estimates of urban nutrient loads are included in Report #1 of the 1991 Reevaluation, "Nonpoint Source Load Estimates." The specific algorithms used to calculate urban nutrient loads are available in the Chesapeake Bay Watershed Model documentation.

IV. Point Sources Not covered in the 1985 Baseline

The 1985 baseline point source load estimates primarily address industrial and municipal wastewater treatment plants. The point source category, however, does include other types of discharges; these include bypasses, combined sewer overflows, and stormwater runoff. Only the District of Columbia included the nutrient load estimates for CSOs and stormwater. No jurisdictions included bypasses.

This section provides an overview of each of these nontraditional point sources, compiles existing information, and makes recommendations on how existing data bases on nutrient loads from these sources may be better quantified. In keeping with the partnership approach of the Chesapeake Bay Program, it is the option of each jurisdiction whether or not to include nutrient load estimates from nontraditional point sources in its 1985 baseline estimate.

A. BYPASSES:

1. Occurrence. Bypasses generally occur at the treatment facilities or pump stations and are intentional diversions of waste streams from any portion of these facilities (40 CFR 122.41 (m)). Bypasses occur due to power failure, equipment failure, hydraulic overload (I&I), or blockage in all or part of the sewage facilities.

2. **Regulation.** Bypasses are prohibited unless: they are unavoidable to prevent loss of life, personal injury, or severe property damage; no feasible alternative exists; and the permittee notifies the regulatory agency regarding cause, frequency, duration and quantity of flow, generally as an attachment to its DMR.

3. **Impact.** Bypasses can have a dramatic impact on water quality and the aesthetics of receiving streams as a result of the discharge of raw or partially treated wastewater and floatables. Bypasses, due to their sanitary sewage content, can result in violations of water contact recreation standards for fecal bacteria and present a serious public health threat.

4. **Loading Data Assessment.** The Maryland data base was chosen to illustrate bypass data availability. Major Maryland STPs which frequently have bypasses were identified (Cambridge, Cumberland, Thurmont and Grantsville). DMR data was reviewed. For two of these plants (Cumberland and Cambridge), no flow data was available. Data for Thurmont and Grantsville indicated that the bypass flows accounted for 3.3% and 0.6% of the total annual flow. No data on nutrient concentrations were reported to allow calculation of a load. It is assumed that the availability of data and the relative magnitude of bypass events are similar in Pennsylvania, the District of Columbia, and Virginia.

5. **Conclusion.** Although it is not possible to accurately quantify bypasses, all available evidence suggests that their loads are relatively minor. Furthermore, the resources needed to further quantify bypasses is considerable and not justified in light of current demands on state program staff and the relatively low impact of bypasses on nutrient loads.

There are, however, some basic data reporting and compilation steps that can be taken at little or no cost to build a data base. These steps are presented as recommendations for state consideration.

6. **Recommendations:**

a. Enforce regulations that require estimates of the total flow bypassed for each event be reported.

b. Establish a bypass data file that includes all bypass data submitted with each jurisdiction.

c. Encourage nutrient monitoring of significant or representative bypass events and development of default values for application elsewhere.

d. Implement consistent reporting requirements between the states.

B. COMBINED SEWER OVERFLOWS. A number of older cities in the Bay watershed are served by a combination of sanitary sewers, storm sewers, and combined sewers carrying both domestic wastewater and storm water. Combined sewers can result in discharges of domestic wastewater and storm water which have not been treated at a municipal wastewater treatment plant. Such discharges are particularly common during storms when flow may exceed the capacity of the sewer system or treatment plant. These untreated discharges of sanitary and storm water to receiving waters are called combined sewer overflows (CSOs).

With the exception of the District of Columbia, nutrient loadings from CSOs are not included in the 1985 baseline. The rationale for not including them is as follows:

(1) CSOs are Minor Contribution to Nutrient Loads. The limited data available indicate that the contribution of nutrient loads from CSOs is relatively minor. Although the volume of CSOs can be quite large, nutrient concentrations are low. The city of Richmond, for example, is one of the major metropolitan areas BFL in the Bay basin. Almost one third of the city's land area is served by combined sewers. A study of Richmond CSOs estimated CSO volume as ranging from 2.5 to 6 billion gallons per year and containing an annual average nutrient load of 84,600 lbs/yr TP and 310,000 lbs/yr TKN. Compared to 1985 loads, the estimates of phosphorus are equivalent to only 2% of the total point source phosphorus loads to the James River.

(2) Data Are Not Available to Develop Reasonable Loading Estimates. With the exception of the District of Columbia, existing data bases are inadequate to quantify nutrient loads from CSOs. The District began a major CSO study in 1978. As a result, sufficient data were available on flow and average pollutant concentrations to develop a nutrient loading from CSOs for the 1985 baseline. For most communities, however, CSO data are either lacking or limited to estimates of volume. For the few communities which have characterized their CSO water quality, the parameters of most concern are fecal coliform, suspended solids, and biochemical oxygen demand (BOD). Nutrients may or may not be included in characterization, modeling, and tracking progress.

Data are not available to estimate nutrient loads for CSOs. In Virginia, some water quality data are available for Richmond, one of four communities with combined sewers. However, the available data for Richmond is not sufficient to estimate a 1985 baseline load.

(3) CSO Loads Are Difficult to Include as Inputs in 3-D Model. One of the principal reasons for quantifying nutrient loads is for input into the Chesapeake Bay 3-D model for reevaluation of the Nutrient Reduction Strategy. There are two options to consider.

First, a CSO load could be input into the model as a point source with its annual load equally distributed. Unlike the other point source inputs, however, CSOs are highly dependent on storm events. CSO discharges are intermittent, varying in volume and pollutant concentration depending on the rainfall pattern. This variability and dependence on rainfall would not be accounted for if CSO discharges were a point source input to the model.

Second, CSOs could be considered as a nonpoint source for purposes of the model. The watershed model estimates urban nonpoint source stormwater loads. Since the urban component is based on total urban acreage, the stormwater component of CSOs may be captured by the urban load estimate and there is potential for double counting. Presently, the level of precision for the urban component does not warrant small adjustments to account for the domestic wastewater component of CSOs. In some cases, such as with Richmond's retention basin, CSO discharges will occur less frequently than stormwater discharges, compensating for the somewhat greater concentration of nutrients in CSOs relative to stormwater.

(4) Bay States Are Addressing CSOs, But Corrections Will Take Years. A national strategy has been developed by EPA to control CSOs. The objectives of the Strategy are to: (1) eliminate dry weather CSO discharges; (2) bring all wet weather CSO discharge points into compliance with technology-based and water quality-based requirements; and (3) minimize adverse impacts from wet weather discharges. States are required to identify all CSOs and develop statewide CSO permitting strategies by January 1990, setting priorities for permitting and control activities.

Implementation of the control strategies in the Bay states will lead to reduced loadings of pollutants, including nutrients, from combined sewers. The high cost of control measures, however, will limit the rate at which implementation can occur. Jurisdictions in Pennsylvania, Maryland and Virginia identified as having CSOs are listed in Table C. It should be noted that Pennsylvania's inventory is detailed and includes small wildcat sewer systems in economically depressed rural areas. These dischargers, for the most part, have little regional environmental significance but are important because of local public health concerns.

TABLE C - INVENTORY OF CSOs

STATE	FACILITY NAME	COUNTY
Pennsylvania		
	Moosic Boro SS	Lackawanna
	Old Forge SS	Lackawanna
	Clarks Green Boro SS	Lackawanna
	Taylor Boro SS	Lackawanna
	West Hazelton Boro SS	Luzerne
	Hazelton Boro SS	Luzerne
	Susquehanna SS	Susquehanna
	Oakland Boro SS	Susquehanna
	Galeton Boro STP	Potter
	Centralia Mun Coll SS	Columbia
	Canton Boro Auth STP	Bradford
	Eagles Mere STP	Sullivan
	Berwick Boro	Columbia
	Williamsport West STP	Lycoming
	Sunbury STP	Northumberland
	Mount Carmel Boro STP	Northumberland
	Altoona East STP	Blair
	Altoona West STP	Blair
	Harrisburg STP	Dauphin
	Lancaster South WPCC STP	Lancaster
	Marysville STP	Perry
	Newport STP	Perry
	Huntingdon	Huntingdon
	Holidaysburg Boro Auth	Blair
	Burnham Boro Auth	Blair
	Vintondale STP	Cambria
	N Cambria Co Auth STP	Cambria
	Scranton Sew Auth STP	Lackawanna
	Freeland WWTP STP	Luzerne
	Montrose MA STP	Susquehanna
	Tunkhannock Bor Mun Auth	Wyoming Creek
	Tri-Boro Mun Auth	Susquehanna
	Wyoming Valley San Auth	Luzerne
	Lackawanna R Basin Sew Auth	Wayne
	Lackawanna R Basin Sew Auth	Lackawanna
	Lackawanna R Basin Sew Auth	Lackawanna
	Lackawanna R Basin Sew Auth	Lackawanna
	Lackawanna Valley San Auth	Lackawanna
	Greater Hazelton Joint Sewer	Luzerne
	Williamsport Central	Lycoming
	Mid-Cameron Auth	Cameron
	Clearfield Mun Auth	Clearfield
	Houtzdale Mun Auth	Clearfield
	Mansfield Boro Auth	Tioga
	Moshannen Valley Auth	Centre
	Wilkes-Barre City	Luzerne

Table C. Continued

STATE	FACILITY NAME	COUNTY
Virginia	Richmond	Henrico
	Alexandria	Fairfax
	Lynchburg	Bedford
	Covington	Alleghany
Maryland	Patapsco	Baltimore
	Cambridge	Dorchester
	Cumberland	Allegany
	Federalsburg	Caroline
	Salisbury	Wicomico

Conclusion. CSOs are not presently included in the urban nonpoint source component of the watershed model. The magnitude and variability of nutrient loads from CSOs make it very difficult to quantify an annual load, particularly for a specific year, such as 1985. Implementation of the National CSO strategy will result in annual nutrient load estimates for future years. Including CSO loads in the point source inventory at this time without considering the stormwater component could result in duplicating a portion of the urban nutrient nonpoint source load.

Recommendations

- Where quantitative data are available, such as in the District of Columbia, progress should be reported in terms of reduced loads.

- Where quantifiable data does not exist, progress at implementing CSO monitoring and control plans to eliminate or treat CSO discharges should be reported as part of the nutrient strategy progress reporting. Monitoring data on nutrient loads, if available, should also be incorporated in this reporting.

- The jurisdictions should be encouraged to conduct nutrient sampling and to make CSO volume estimates for significant or representative CSO events to enable estimation of nutrient loads and development of default values.

- The states should encourage and support local jurisdictions in characterizing nutrient loads from CSOs.

C. STORMWATER

Introduction

The issue of regulating point source storm water discharges under the NPDES permit program has had a lengthy and controversial

history dating back to the 1972 Amendments to the Federal Water Pollution and Control Act which established the NPDES permit program. To date, the primary focus of the NPDES permit program has been to control municipal sewage and industrial process wastewater, not storm water. In 1987, the Clean Water Act Amendments required the EPA to develop a phased approach for controlling storm water discharges through the NPDES permit program. In response, EPA in 1990 proposed regulations to establish a two phase program for storm water control (FR 47990). In Phase I, EPA established storm water permit application requirements for 11 categories of industrial storm water discharges and for municipal separate storm sewer systems. In Phase II, EPA will establish permit application requirements for storm water discharges not covered in Phase I and define storm water control measures to be implemented.

The phased approach also redirects previous emphasis from extensive sampling to limited sampling of representative outfalls and calls for screening analysis to provide data for developing more comprehensive programs to detect illicit connections and illegal dumping. The proposed regulations apply only to separate storm sewers and do not apply to combined sewers.

Who is Covered Under Phase I

1. Storm water discharge associated with industrial activity - includes any point source stormwater discharge that is located at an industrial plant, directly related to manufacturing, or located at raw material processing/storage areas. Runoff from lands separate from these areas is excluded from the definition (i.e., employee parking areas and office buildings).

2. Discharge from a municipal separate storm sewer systems - publicly owned or operated separate storm water sewers in municipalities having the required population. The jurisdictions in the Bay watershed required to submit NPDES stormwater permit applications are:

Alexandria	District of Columbia *	Norfolk *
Anne Arundel Co.	Fairfax	Portsmouth
Arlington	Hampton	Prince George's Co.
Baltimore City	Montgomery Co.	Prince William County*
Chesapeake	Newport News	Richmond

* Populations greater than 250,000

3. A stormwater discharge designated as contributing to a violation of a water quality standard or as a significant contributor of pollutants is required to submit an NPDES stormwater permit application.

Permit Application Requirements

1. Municipal - There is a two-part permit application:

Part I - requires municipalities to describe their existing stormwater management program, begin to identify sources of pollution, provide initial estimates of the amounts of pollutants discharged and to conduct a screening analysis for illicit discharges to municipal separate storm sewers.

Part II - fills information gaps found in Part I and provides municipalities with the opportunity to propose a comprehensive program of structural and non-structural control measures. These program controls are primarily intended to be based on best management practices instead of constructing new treatment works.

2. Industrial - stormwater permit applications from industrial stormwater dischargers are required to provide limited sampling data, a description of material management practices, and certification that the discharge does not contain process wastes or sanitary sewage. Industrial storm water dischargers to municipal storm sewers will not have to submit permit applications. However, dischargers to municipal storm sewers located in cities of 100,000 or more must notify the municipality of their discharge.

Phase I Storm Water Application Deadlines

1. Storm water discharge associated with industrial activity.

	DEADLINES
a. Individual application	October 1, 1992
b. Group application	Part 1, September 30, 1991 Part 2, October 1, 1992
c. Notice of Intent to be covered by a General Permit	EPA has proposed 180-day after the General Permit is available or October 1, 1992, whichever comes first

2. Storm water discharge from a municipal separate storm sewer system.

	DEADLINES
a. Large municipalities (Population $\geq$ 250,000)	Part 1, November 18, 1991 Part 2, November 16, 1992
b. Medium municipalities (250,000 > Population $\geq$100,000)	Part 1, May 18, 1992 Part 2, May 17, 1993

Phase II Deadlines

1. EPA to promulgate regulations	October 1, 1993
2. Phase II storm water discharge applications	October 1, 1994

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V. References

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Legg, Peter. 1991. Summary of 1990 Maryland Point Source Nutrient Loadings to the Chesapeake Bay with Projections for 1991-2000. Maryland Department of the Environment, Chesapeake Bay and Special Projects Program, Baltimore, MD.

United States Environmental Protection Agency. 1983. Chesaopeake Bay: A Framework for Action. United States Environmental Protection Agency, Region III, Philadelphia, PA.

VI. APPENDIX I 1985 Plant Loadings

APPENDIX 1. 1985 BASELINE POINT SOURCE NUTRIENT LOADS BY FACILITY (FACNAME) SORTED BY BASIN, STATE, FALLINE AND DISTYPE

OBS	BASIN	FALLINE	STATE	DISTYPE	FACNAME	NPDES	FLOW85	TP85	TN85	TPL85	TNL85
1	BAY, E SHORE	BFL	VA	IND	HOLLY FARMS - TEMP'VILLE	4049	0.80	1.15	113.91	2802.25	277403.00
2	BAY, E SHORE	BFL	VA	MUN	KILMARNOCK STP	20788	0.17	6.40	18.70	3294.00	9677.19
3	BAY, E SHORE	BFL	VA	MUN	ONANCOCK STP	21253	0.11	6.40	18.70	2143.05	6261.71
4	BAY, E SHORE	BFL	VA	MUN	CAPE CHARLES STP	21288	0.00	0.00	0.00	0.00	0.00
5	BAY, E SHORE	BFL	VA	MUN	MATHEWS COURTHOUSE STP	28819	0.03	6.40	18.70	555.00	1707.74
6	BAY, E SHORE	BFL	VA	MUN	GLOUCESTER STP	60381	0.12	6.40	18.70	2337.87	6830.96
7	BAY, E SHORE	BFL	VA	MUN	REEDVILLE STP	60712	0.03	6.40	18.70	584.47	1707.74
8	BAY, E SHORE	BFL	VA	MUN	TANGIER ISLAND STP	67423	0.06	6.40	18.70	1168.93	3415.48
9	BAY, E SHORE	BFL	VA	MUN	HRSD-CHESAPEAKE/ELIZ. STP (VA0025275)	81264	14.36	6.50	22.78	284136.29	995788.00
10	CHOPTANK	BFL	MD	MUN	MARYLAND MINORS (10), SUM	.	1.20	6.91	18.16	25367.10	66670.50
11	CHOPTANK	BFL	MD	MUN	EASTON	20273	1.40	5.43	13.77	23228.00	58866.00
12	CHOPTANK	BFL	MD	MUN	CAMBRIDGE	21636	2.15	7.00	18.00	45767.40	117687.70
13	E SHORE	BFL	DE	IND	PURDUE	469	1.15	1.50	0.45	5254.22	1576.27
14	E SHORE	BFL	DE	MUN	BRIDGEVILLE STP	20249	0.80	7.20	20.70	17574.68	50527.21
15	E SHORE	BFL	DE	MUN	SEAFORD WASTE TREATMENT PLANT,	20265	0.72	6.40	15.83	14011.26	34655.96
16	E SHORE	BFL	MD	MUN	MARYLAND MINORS (52), SUM	.	4.49	5.62	18.70	76916.40	256068.10
17	E SHORE	BFL	MD	MUN	CRISFIELD	20001	0.69	2.76	9.70	5835.90	20501.00
18	E SHORE	BFL	MD	MUN	CHESTERTOWN	20010	.	.	.	.	.
19	E SHORE	BFL	MD	MUN	DELMAR	20532	.	.	.	.	.
20	E SHORE	BFL	MD	MUN	PERRYVILLE	20613	0.56	0.63	8.97	1060.60	15210.80
21	E SHORE	BFL	MD	MUN	PRINCESS ANNE	20656	.	.	.	.	.
22	E SHORE	BFL	MD	MUN	ELKTON	20681	0.77	2.53	22.76	5911.10	53198.50
23	E SHORE	BFL	MD	MUN	SALISBURY	21571	4.61	7.00	18.00	98324.30	252834.00
24	E SHORE	BFL	MD	MUN	POCOMOKE CITY	22551	.	.	.	.	.
25	E SHORE	BFL	MD	MUN	HURLOCK	22730	0.54	7.00	18.00	11534.50	29660.10
26	E SHORE	BFL	MD	MUN	KENT ISLAND	23485	0.62	5.16	20.09	9690.50	37758.70
27	JAMES	AFL	VA	IND	OWENS-ILLINOIS (BIG ISL.)	3026	304	3.46	5.92	32019.00	54784.00
28	JAMES	AFL	VA	IND	WESTVACO	3646	22.78	0.29	8.00	20110.00	554757.00
29	JAMES	AFL	VA	IND	BABCOCK & WILCOX-NUKE FUEL	3697	0.28	0.48	854.40	409.37	728246.00
30	JAMES	AFL	VA	IND	BURLINGTON IND.-GLASGOW	4677	0.71	17.52	11.28	37866.00	24380.00
31	JAMES	AFL	VA	MUN	LEXINGTON STP	20567	0.87	6.40	18.70	16949.55	49524.46
32	JAMES	AFL	VA	MUN	BUENA VISTA STP	20991	1.88	6.40	18.70	36626.61	107018.38
33	JAMES	AFL	VA	MUN	FARMVILLE STP	21351	0.31	6.40	18.70	6039.49	17646.65
34	JAMES	AFL	VA	MUN	CLIFTON FORGE STP	22772	1.14	6.40	18.70	22209.75	64894.12
35	JAMES	AFL	VA	MUN	LYNCHBURG STP	24970	13.75	4.70	11.01	196306.00	460839.00
36	JAMES	AFL	VA	MUN	MOORES CREEK STP	25518	8.99	3.32	10.56	90857.00	288990.00
37	JAMES	AFL	VA	MUN	COVINGTON STP	25542	1.92	6.40	18.70	37405.90	109295.37
38	JAMES	BFL	VA	IND	AMERICAN TOBACCO	2780	1.33	3.36	12.19	13603.00	49353.00
39	JAMES	BFL	VA	IND	VA CHEMICALS	3387	0.58	0.30	56.10	529.99	99049.00
40	JAMES	BFL	VA	IND	HOLLY FARMS - GLEN ALLEN	4031	0.59	0.08	73.76	143.77	132474.00

FALLINE AFL= ABOVE FALL LINE; FALLINE BFL= BELOW FALL LINE
DISTYPE MUN = MUNICIPAL POINT SOURCE; DISTYPE IND = INDUSTRIAL POINT SOURCE
TP85 = 1985 TOTAL PHOSPHORUS CONCENTRATION IN MG/L; TN85 = 1985 TOTAL NITROGEN CONCENTRATION IN MG/L
TPL85 = 1985 TOTAL PHOSPHORUS LOAD IN POUNDS/YEAR; TNL85 = 1985 TOTAL NITROGEN LOAD IN POUNDS/YEAR

APPENDIX 1. 1985 BASELINE POINT SOURCE NUTRIENT LOADS BY FACILITY (FACNAME) SORTED BY BASIN, STATE, FALLINE AND DISTYPE

OBS	BASIN	FALLINE	STATE	DISTYPE	FACNAME	NPDES	FLOW85	TP85	TN85	TPL85	TNL85
41	JAMES	BFL	VA	IND	DUPONT SPRUANCE - 02 AND 03	4669	28.10	0.29	3.11	22228.00	183888.00
42	JAMES	BFL	VA	IND	ALLIED CHEMICAL - HOPEWELL	5291	137.59	0.07	10.65	29319.00	4460622.00
43	JAMES	BFL	VA	IND	PHILLIP MORRIS-PARK 500	26557	1.44	13.82	34.79	60370.00	151951.00
44	JAMES	BFL	VA	IND	SMITHFIELD FOODS (001)	59005	1.26	23.36	37.06	89599.00	142146.00
45	JAMES	BFL	VA	IND	SMITHFIELD-GWALTNEY (002)	59005	1.20	32.23	60.38	117734.00	220563.00
46	JAMES	BFL	VA	MUN	SMITHFIELD STP	23809	0.44	6.40	18.70	8572.19	25046.85
47	JAMES	BFL	VA	MUN	CHESTERFIELD CO-FALLING CRK STP	24996	10.11	6.80	24.95	209275.79	767857.00
48	JAMES	BFL	VA	MUN	PORTSMOUTH STP	25003	9.31	6.40	18.70	181379.65	529968.68
49	JAMES	BFL	VA	MUN	FORT EUSTIS	25216	1.65	6.40	18.70	32145.70	93925.71
50	JAMES	BFL	VA	MUN	PETERSBURG STP	25437	8.48	5.60	19.88	144558.22	513182.00
51	JAMES	BFL	VA	MUN	CHESTERFIELD CO-PROCTORS CRK STP	60194	3.77	5.50	15.39	63119.00	176620.00
52	JAMES	BFL	VA	MUN	RICHMOND STP	63177	66.10	4.17	12.24	839067.00	2462872.00
53	JAMES	BFL	VA	MUN	HENRICO CO. STP	63690	0.00	0.00	0.00	0.00	0.00
54	JAMES	BFL	VA	MUN	HOPEWELL STP	66630	30.82	1.87	65.03	175442.00	6101060.00
55	JAMES	BFL	VA	MUN	HRSD-ARMY BASE STP (OLD VA0025208)	81230	12.99	4.50	19.56	177942.87	773458.00
56	JAMES	BFL	VA	MUN	HRSD-BOAT HARBOR STP (OLD VA0025283)	81256	15.85	5.40	22.33	260544.52	1077400.00
57	JAMES	BFL	VA	MUN	HRSD-JAMES RIVER STP (OLD VA0025241)	81272	10.34	7.20	20.05	226627.16	631094.00
58	JAMES	BFL	VA	MUN	HRSD-LAMBERTS POINT STP (OLD VA0025259)	81281	19.97	3.30	21.99	200609.23	1336787.00
59	JAMES	BFL	VA	MUN	HRSD-HANSEMOND STP (OLD VA0064459)	81299	6.25	7.00	26.76	133179.38	509126.00
60	JAMES	BFL	VA	MUN	HRSD-WILLIAMSBURG STP (OLD VA0025267)	81302	9.72	3.80	21.36	112436.88	632014.00
61	PATUXENT	AFL	MD	IND	MD & VA MILK PRODUCERS	469	0.17	27.25	4.05	14418.40	2143.90
62	PATUXENT	AFL	MD	MUN	MARYLAND MINORS (10), SUM	.	0.48	3.69	18.14	5373.70	26436.10
63	PATUXENT	AFL	MD	MUN	BOWIE	21628	1.99	5.15	15.71	31196.10	95149.20
64	PATUXENT	AFL	MD	MUN	PATUXENT	21652	3.67	6.67	21.12	74630.50	236308.60
65	PATUXENT	AFL	MD	MUN	FORT MEADE	21717	2.09	0.85	15.83	5416.50	100822.90
66	PATUXENT	AFL	MD	MUN	PARKWAY	21725	4.62	2.91	18.00	40883.40	253302.50
67	PATUXENT	AFL	MD	MUN	MARYLAND CITY	23132	0.62	5.02	18.62	9561.90	35435.40
68	PATUXENT	AFL	MD	MUN	LITTLE PATUXENT	55174	8.91	0.43	19.33	11755.70	524861.00
69	PATUXENT	AFL	MD	MUN	MARYLAND CITY	62596	.	.	.	.	.
70	PATUXENT	AFL	MD	MUN	DORSEY RUN	63207	1.32	1.63	5.39	6529.10	21620.80
71	PATUXENT	BFL	MD	MUN	MARYLAND MINORS (13), SUM	.	0.60	3.99	11.79	7280.50	21517.70
72	PATUXENT	BFL	MD	MUN	WESTERN BRANCH	21741	10.79	2.95	14.58	96887.70	479353.70
73	POTOMAC	AFL	MD	IND	WESTVACO	1422	3.89	0.09	1.92	1065.40	22729.10
74	POTOMAC	AFL	MD	IND	UPPER POTOMAC RIVER COMMISSION	21687	18.99	0.84	3.58	48297.40	206975.10
75	POTOMAC	AFL	MD	IND	W D BYRON	53431	0.34	0.05	109.54	51.20	112165.50
76	POTOMAC	AFL	MD	MUN	MARYLAND MINORS (63), SUM	.	5.53	6.81	18.31	114793.10	308471.40
77	POTOMAC	AFL	MD	MUN	HALFWAY	20214	1.12	7.00	18.00	23897.80	61451.40
78	POTOMAC	AFL	MD	MUN	TANEYTOWN	20672	.	.	.	.	.
79	POTOMAC	AFL	MD	MUN	FORT DETRICK	20877	0.68	2.02	18.00	4198.30	37473.60
80	POTOMAC	AFL	MD	MUN	DAMASCUS	20982	.	.	.	.	.

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OBS	BASIN	FALLINE	STATE	DISTYPE	FACNAME	NPDES	FLOW85	TP85	TN85	TPL85	TNL85
81	POTOMAC	AFL	MD	MUN	THURMONT	21121	0.55	5.28	18.00	8791.20	29960.00
82	POTOMAC	AFL	MD	MUN	SENECA CREEK	21491	4.52	1.80	18.23	24791.10	250820.00
83	POTOMAC	AFL	MD	MUN	CUMBERLAND	21598	9.94	7.00	18.00	211923.70	544946.60
84	POTOMAC	AFL	MD	MUN	FREDERICK	21610	4.87	6.11	24.40	90581.60	361873.10
85	POTOMAC	AFL	MD	MUN	HAGERSTOWN	21776	6.02	4.30	9.94	78817.80	182349.10
86	POTOMAC	AFL	MD	MUN	BALLENGER CREEK	21822	.	.	.	.	.
87	POTOMAC	AFL	MD	MUN	WESTMINSTER	21831	2.28	3.92	18.00	27151.40	124770.90
88	POTOMAC	AFL	MD	MUN	POOLESVILLE	23001	0.50	7.00	18.00	10692.40	27494.70
89	POTOMAC	AFL	MD	MUN	MCI	23957	0.77	7.00	18.00	16340.40	42018.20
90	POTOMAC	AFL	MD	MUN	CELANESE	63878	.	.	.	.	.
91	POTOMAC	AFL	PA	IND	LOWENGART & CO.	9521	.	.	.	.	.
92	POTOMAC	AFL	PA	IND	LETTERKENNY ARMY DEPOT/IW	10502	.	.	.	.	.
93	POTOMAC	AFL	PA	MUN	WAYNESBORO BOROUGH	20621	0.97	8.00	22.56	23660.75	66723.30
94	POTOMAC	AFL	PA	MUN	GETTYSBURG MUNICIPAL AUTHORITY	21563	1.50	1.00	24.87	4568.89	113628.23
95	POTOMAC	AFL	PA	MUN	CHAMBERSBURG BOROUGH MAYOR & T	26051	3.98	1.30	11.26	15759.62	136502.52
96	POTOMAC	AFL	PA	MUN	WASHINGTON TOWNSHIP MUNICIPAL	80225	0.47	6.50	23.90	9226.11	33923.69
97	POTOMAC	AFL	VA	IND	ROCCO FURTHER PROC.	1791	0.08	60.00	51.30	14612.00	12493.00
98	POTOMAC	AFL	VA	IND	AILEEN, INC.	1864	0.60	7.13	8.74	13023.00	15963.00
99	POTOMAC	AFL	VA	IND	DUPONT - WAYNESBORO	2160	4.34	4.33	22.68	57205.00	299634.00
100	POTOMAC	AFL	VA	IND	MERCK - ELKTON	2178	6.44	3.09	11.93	60576.00	233876.00
101	POTOMAC	AFL	VA	IND	AVTEX FIBERS	2208	10.99	0.11	15.40	3680.00	515202.00
102	POTOMAC	AFL	VA	IND	ROCCO FARM FOODS (001) (OLD VA0001902)	77402	0.57	11.00	84.90	19087.00	147313.00
103	POTOMAC	AFL	VA	MUN	STRASBURG STP	20311	0.74	6.40	18.70	14416.86	42124.26
104	POTOMAC	AFL	VA	MUN	LEESBURG STP	21377	1.26	0.67	18.70	2569.83	71725.08
105	POTOMAC	AFL	VA	MUN	PURCELLVILLE STP	22802	0.27	6.40	18.70	5260.20	15369.66
106	POTOMAC	AFL	VA	MUN	WINCHESTER STP	25135	3.64	6.40	18.70	70915.35	207205.80
107	POTOMAC	AFL	VA	MUN	WAYNESBORO STP	25151	3.20	4.96	19.60	48315.96	190925.95
108	POTOMAC	AFL	VA	MUN	FISHERSVILLE STP	25291	0.78	6.40	18.70	15196.15	44401.24
109	POTOMAC	AFL	VA	MUN	ABRAMS CREEK STP	31780	0.34	6.40	18.70	6623.96	19354.39
110	POTOMAC	AFL	VA	MUN	HARRISONBURG/ROCKINGHAM STP	60640	6.45	6.40	18.70	125660.45	367164.12
111	POTOMAC	AFL	VA	MUN	LURAY STP	62642	0.74	6.40	18.70	14416.86	42124.26
112	POTOMAC	AFL	VA	MUN	FRONT ROYAL STP	62812	1.97	6.40	18.70	38380.01	112141.60
113	POTOMAC	AFL	VA	MUN	VERONA STP	64637	0.28	6.40	18.70	5455.03	15938.91
114	POTOMAC	AFL	VA	MUN	STAUNTON STP	64793	2.58	6.40	18.70	50264.18	146865.65
115	POTOMAC	AFL	VA	MUN	FWSA OPEQUON STP	65552	0.00	0.00	0.00	0.00	0.00
116	POTOMAC	AFL	VA	MUN	STUARTS DRAFT STP	66877	0.50	6.40	18.70	9741.12	28462.34
117	POTOMAC	AFL	WV	MUN	ROMNEY, CITY OF	20699	0.50	6.50	17.12	9899.26	26073.12
118	POTOMAC	AFL	WV	MUN	CHARLES TOWN SEWER DEPARTMENT,	22349	0.53	6.50	20.90	10493.21	33739.71
119	POTOMAC	AFL	WV	MUN	MARTINSBURG, CITY OF	23167	3.00	6.50	14.77	59395.54	134964.94
120	POTOMAC	AFL	WV	MUN	KEYSER, CITY OF	24392	0.71	6.50	16.95	14056.94	36656.18

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APPENDIX 1. 1985 BASELINE POINT SOURCE NUTRIENT LOADS BY FACILITY (FACNAME) SORTED BY BASIN, STATE, FALLINE AND DISTYPE

OBS	BASIN	FALLINE	STATE	DISTYPE	FACNAME	NPDES	FLOW85	TP85	TN85	TPL85	TNL85
121	POTOMAC	BFL	DC	MUN	COMBINED SEWER O.	.	.	.	.	36800.00	148400.00
122	POTOMAC	BFL	DC	MUN	DC-BLUE PLAINS	21199	178.68	0.13	15.46	70935.00	8412030.00
123	POTOMAC	BFL	MD	IND	INDIAN HEAD NOS	3158	0.27	6.35	313.47	5143.50	254036.10
124	POTOMAC	BFL	MD	IND	MINERAL PIGMENTS	3425	0.04	4.60	1723.80	510.30	191238.30
125	POTOMAC	BFL	MD	MUN	MARYLAND MINORS (41), SUM	.	2.70	4.18	10.73	34351.70	88265.90
126	POTOMAC	BFL	MD	MUN	LA PLATA	20524	0.80	2.54	18.00	6204.30	43906.90
127	POTOMAC	BFL	MD	MUN	PISCATAWAY	21539	12.90	0.17	14.07	6559.30	553224.60
128	POTOMAC	BFL	MD	MUN	MATTAWOMAN	21865	4.54	3.95	12.50	54634.10	173037.00
129	POTOMAC	BFL	MD	MUN	BLUE PLAINS, MD CONTRIBUTION	211990	119.79	0.13	15.46	47422.80	5640900.20
130	POTOMAC	BFL	VA	MUN	DALE CITY #8 STP	24678	0.84	0.33	15.00	843.82	38355.66
131	POTOMAC	BFL	VA	MUN	DALE CITY #1 STP	24724	2.00	0.18	15.00	1095.88	91323.00
132	POTOMAC	BFL	VA	MUN	UPPER OCCOQUAN SAN. AUTH. STP	24988	9.41	0.03	20.86	859.35	597534.00
133	POTOMAC	BFL	VA	MUN	PRINCE WM. CO.-MOONEY STP	25101	7.58	0.16	26.40	3691.88	609160.94
134	POTOMAC	BFL	VA	MUN	ARLINGTON STP	25143	26.56	0.58	20.30	46893.75	1641281.31
135	POTOMAC	BFL	VA	MUN	ALEXANDRIA STP	25160	35.60	0.15	18.40	16255.49	1994007.26
136	POTOMAC	BFL	VA	MUN	FAIRFAX CO.-LOWER POTOMAC STP	25364	32.96	0.14	19.00	14046.70	1906337.18
137	POTOMAC	BFL	VA	MUN	FAIRFAX CO.-L. RUNTING CREEK STP	25372	3.82	0.19	24.00	2209.41	279083.09
138	POTOMAC	BFL	VA	MUN	COLONIAL BEACH STP	26409	0.40	6.40	18.70	7793.00	22769.87
139	POTOMAC	BFL	VA	MUN	KING GEORGE - DAHLGREN	26514	0.08	6.40	18.70	1510.00	4553.97
140	POTOMAC	BFL	VA	MUN	QUANTICO-MAINSIDE STP	28363	1.45	0.20	18.70	883.00	82540.77
141	POTOMAC	BFL	VA	MUN	KING GEORGE - BAYBERRY	28517	0.02	6.40	18.70	390.00	1138.49
142	POTOMAC	BFL	VA	MUN	STAFFORD CO.-AQUIA STP	60968	1.14	0.59	18.70	2047.00	64894.12
143	RAPPAHANNOCK	AFL	VA	MUN	WARRENTON STP	21172	1.05	6.40	18.70	20456.00	59770.90
144	RAPPAHANNOCK	AFL	VA	MUN	ORANGE STP	21385	0.61	6.40	18.70	11884.00	34724.05
145	RAPPAHANNOCK	AFL	VA	MUN	CULPEPER STP	61590	1.21	8.81	14.27	32450.00	52562.00
146	RAPPAHANNOCK	AFL	VA	MUN	REMINGTON REGIONAL STP	76805	0	0	0	0	0
147	RAPPAHANNOCK	BFL	VA	IND	BARNHARDT FARMS	3123	0.42	9.60	20.13	12277.00	25737.00
148	RAPPAHANNOCK	BFL	VA	MUN	FREDERICKSBURG STP	25127	2.57	6.40	18.70	50069.36	146296.40
149	RAPPAHANNOCK	BFL	VA	MUN	SPOTSYLVANIA CO.-MASSAPONAX STP	25658	1.55	6.27	18.70	29584.00	88233.24
150	RAPPAHANNOCK	BFL	VA	MUN	URBANNA STP	26263	0.05	6.40	18.70	974.11	2846.23
151	RAPPAHANNOCK	BFL	VA	MUN	WARSAW STP	26891	0.08	6.40	18.70	1559.00	4553.97
152	RAPPAHANNOCK	BFL	VA	MUN	STAFFORD CO.-CLAIBORNE RUN STP	28096	0.88	6.40	18.70	17144.00	50093.71
153	RAPPAHANNOCK	BFL	VA	MUN	SPOTSYLVANIA CO.-FMC STP	68110	0.00	0.00	0.00	0.00	0.00
154	RAPPAHANNOCK	BFL	VA	MUN	TAPPAHANNOCK STP	75395	0.22	6.40	18.70	4286.00	12523.43
155	RAPPAHANNOCK	BFL	VA	MUN	LITTLE FALLS RUN STP	76392	0.00	0.00	0.00	0.00	0.00
156	SUSQUEHANNA	AFL	NY	MUN	NORWICH WASTE DISPOSAL PLANT	21423	2.60	6.50	30.04	51476.13	237898.93
157	SUSQUEHANNA	AFL	NY	MUN	BATH (V) WWTP	21431	0.77	6.50	16.97	15244.85	39800.80
158	SUSQUEHANNA	AFL	NY	MUN	CORNELL (C) WATER POLLUTION CO	23647	1.89	6.50	15.74	37419.19	90612.00
159	SUSQUEHANNA	AFL	NY	MUN	BINGHAMTON-JOHNSON CITY JNT BO	24414	27.70	6.50	25.97	548418.80	2191144.02
160	SUSQUEHANNA	AFL	NY	MUN	CORNING (C) WASTEWATER TREATME	25721	0.96	6.50	19.77	19006.57	57809.22

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APPENDIX 1. 1985 BASELINE POINT SOURCE NUTRIENT LOADS BY FACILITY (FACNAME) SORTED BY BASIN, STATE, FALLINE AND DISTYPE

OBS	BASIN	FALLINE	STATE	DISTYPE	FACNAME	NPDES	FLOW85	TP85	TN85	TPL85	TNL85
161	SUSQUEHANNA	AFL	NY	MUN	OWEGO WATER POLL CTRL PLT #2	25798	0.63	6.50	15.83	12473.06	30376.71
162	SUSQUEHANNA	AFL	NY	MUN	CORTLAND (C) WWTP	27561	4.86	6.50	17.38	96220.77	257279.54
163	SUSQUEHANNA	AFL	NY	MUN	ENDICOTT (V) WATER POLLUTION C	27669	6.80	6.50	21.06	134629.89	436200.83
164	SUSQUEHANNA	AFL	NY	MUN	OWEGO (V) STP	29262	0.69	6.50	15.42	13660.97	32408.03
165	SUSQUEHANNA	AFL	NY	MUN	SIDNEY (V) WWTP	29271	0.60	6.50	16.54	11879.11	30227.76
166	SUSQUEHANNA	AFL	NY	MUN	WAVERLY (V) WWTP	31089	0.61	6.50	27.70	12077.09	51466.99
167	SUSQUEHANNA	AFL	NY	MUN	ONEONTA (C) WWTP	31151	2.62	6.50	16.88	51872.10	134707.86
168	SUSQUEHANNA	AFL	NY	MUN	RICHFIELD SPRINGS (V) SEWAGE T	31411	0.59	6.50	16.58	11681.12	29795.85
169	SUSQUEHANNA	AFL	NY	MUN	MILTON STREET STP	35742	5.00	6.50	28.21	98992.56	429627.72
170	SUSQUEHANNA	AFL	NY	MUN	CHEMUNG COUNTY S D #1	36986	4.90	6.50	19.68	97012.71	293724.64
171	SUSQUEHANNA	AFL	PA	IND	WESTOVER LEATHER CO	7439	.	.	.	.	308279.91
172	SUSQUEHANNA	AFL	PA	IND	EMPIRE KOSHER POULTRY/MIFFLINT	7552	.	.	.	13783.72	78371.35
173	SUSQUEHANNA	AFL	PA	IND	HARLEY DAVIDSON MOTOR CO.	7765	.	.	.	.	.
174	SUSQUEHANNA	AFL	PA	IND	ELECTRO-PLATERS OF YORK, INC.	7773	.	.	.	.	.
175	SUSQUEHANNA	AFL	PA	IND	GOLD MILLS DYEHOUSE	8231	.	.	.	.	.
176	SUSQUEHANNA	AFL	PA	IND	APPLETON PAPER SPRINGMILL	8265	.	.	.	.	.
177	SUSQUEHANNA	AFL	PA	IND	PP&L BRUNNER ISLAND	8281	.	.	.	.	.
178	SUSQUEHANNA	AFL	PA	IND	BETHLEHEM STEEL-STEELTON	8303	.	.	.	.	97674.00
179	SUSQUEHANNA	AFL	PA	IND	MERCK & CO.	8419	.	.	.	.	.
180	SUSQUEHANNA	AFL	PA	IND	BURLE INDUSTRIES	8508	.	.	.	.	.
181	SUSQUEHANNA	AFL	PA	IND	WESTFIELD TANNING COMPANY	8800	.	.	.	.	47148.69
182	SUSQUEHANNA	AFL	PA	IND	P-H GLATFELTER CO-WASTE TREAT	8869	.	.	.	.	.
183	SUSQUEHANNA	AFL	PA	IND	PROCTOR & GAMBLE PAPER PRODUCT	8885	.	.	.	.	.
184	SUSQUEHANNA	AFL	PA	IND	CORNING ASASHI VIDEO PRODUCTS	8923	.	.	.	.	.
185	SUSQUEHANNA	AFL	PA	IND	GTE PRODUCTS CORP.	9024	.	.	.	.	.
186	SUSQUEHANNA	AFL	PA	IND	STANDARD STEEL DIV OF FREEDOM	9164	.	.	.	.	35697.00
187	SUSQUEHANNA	AFL	PA	IND	CHLOE TEXTILES INC	9172	.	.	.	.	.
188	SUSQUEHANNA	AFL	PA	IND	CONSOLIDATED RAIL CORP- ENOLA	9229	.	.	.	.	.
189	SUSQUEHANNA	AFL	PA	IND	HOWES LEATHER CO.	9300	.	.	.	.	.
190	SUSQUEHANNA	AFL	PA	IND	MANDATA POULTRY CO-HERNDON	9474	.	.	.	10746.63	61103.08
191	SUSQUEHANNA	AFL	PA	IND	PHILADELPHIA ELECTRIC CO.	9733	.	.	.	.	.
192	SUSQUEHANNA	AFL	PA	IND	ALLEN CLARK, INC	10596	.	.	.	12183.70	5238.99
193	SUSQUEHANNA	AFL	PA	IND	WYETH-AYERST LABORATORIES	13862	.	.	.	.	.
194	SUSQUEHANNA	AFL	PA	IND	VICTOR F WEAVER, INC	35092	.	.	.	32707.14	185965.90
195	SUSQUEHANNA	AFL	PA	IND	HOLLY MILK DIVISION OF ATLANT	44911	.	.	.	.	.
196	SUSQUEHANNA	AFL	PA	IND	GRINELL CORP	80195	.	.	.	.	.
197	SUSQUEHANNA	AFL	PA	MUN	MOUNT UNION BOROUGH	20214	0.40	8.00	17.73	9649.49	21385.68
198	SUSQUEHANNA	AFL	PA	MUN	MILTON MUN AUTH	20273	1.54	8.00	31.60	37525.80	148226.89
199	SUSQUEHANNA	AFL	PA	MUN	LITITZ SEWAGE AUTHORITY	20320	2.20	1.45	39.54	9716.50	264958.92
200	SUSQUEHANNA	AFL	PA	MUN	BELLEFONTE BOROUGH	20486	1.34	8.00	20.90	32652.32	85304.18

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OBS	BASIN	FALLINE	STATE	DISTYPE	FACNAME	NPDES	FLOW85	TP85	TN85	TPL85	TNL85
201	SUSQUEHANNA	AFL	PA	MUN	MIDDLETOWN WASTEWATER TREATMEN	20664	0.96	1.20	24.56	3494.29	71516.37
202	SUSQUEHANNA	AFL	PA	MUN	MONTGOMERY BOROUGH	20699	0.44	8.00	27.69	10721.66	37110.33
203	SUSQUEHANNA	AFL	PA	MUN	DOVER TOWNSHIP SEWER AUTHORITY	20826	1.60	7.50	23.95	36551.10	116719.85
204	SUSQUEHANNA	AFL	PA	MUN	MECHANICSBURG BOROUGH MUNICIPA	20885	0.84	1.22	26.20	3110.32	66795.31
205	SUSQUEHANNA	AFL	PA	MUN	MANHEIM BOROUGH AUTH	20893	0.42	7.50	23.09	9594.66	29538.77
206	SUSQUEHANNA	AFL	PA	MUN	PINE GROVE BOROUGH AUTHORITY	20915	0.49	0.60	14.30	897.33	21386.35
207	SUSQUEHANNA	AFL	PA	MUN	NEW OXFORD MUNICIPAL FACILITY	20923	0.61	3.40	15.64	6327.60	29106.98
208	SUSQUEHANNA	AFL	PA	MUN	MOUNT JOY SEWAGE TREATMENT PLA	21067	0.77	1.90	22.80	4479.34	53752.05
209	SUSQUEHANNA	AFL	PA	MUN	MYERSTOWN BOROUGH	21075	0.61	0.58	20.90	1084.71	39087.14
210	SUSQUEHANNA	AFL	PA	MUN	MARYSVILLE MUNICIPAL AUTHORITY	21571	0.46	0.29	17.73	403.68	24679.94
211	SUSQUEHANNA	AFL	PA	MUN	WELLSBORO MUN AUTH	21687	0.95	9.50	33.03	27489.47	95576.56
212	SUSQUEHANNA	AFL	PA	MUN	MARIETTA DONEGAL JOINT AUTHORI	21717	0.33	7.50	17.73	7424.44	17551.38
213	SUSQUEHANNA	AFL	PA	MUN	ANNVILLE TOWNSHIP	21806	0.45	1.38	20.90	1874.71	28392.29
214	SUSQUEHANNA	AFL	PA	MUN	MANSFIELD BOROUGH STP	21814	0.40	8.00	15.87	9746.96	19335.53
215	SUSQUEHANNA	AFL	PA	MUN	NEW HOLLAND BOROUGH AUTHORITY	21890	0.52	7.50	27.64	11879.11	43778.47
216	SUSQUEHANNA	AFL	PA	MUN	BEDFORD BOROUGH MUNICIPAL AUTH	22209	0.66	2.00	32.48	4032.80	65492.75
217	SUSQUEHANNA	AFL	PA	MUN	MILLERSBURG BOROUGH AUTHORITY	22535	0.30	8.00	14.58	7358.95	13411.70
218	SUSQUEHANNA	AFL	PA	MUN	ELIZABETHTOWN BOROUGH STP	23108	1.63	2.82	30.02	13957.95	148587.84
219	SUSQUEHANNA	AFL	PA	MUN	MT. HOLLY SPRINGS BOROUGH AUTH	23183	0.22	0.81	20.90	552.65	14259.80
220	SUSQUEHANNA	AFL	PA	MUN	BERWICK MUN AUTH	23248	1.80	9.50	13.31	52085.32	72974.27
221	SUSQUEHANNA	AFL	PA	MUN	TWIN BOROUGHS SANITARY AUTHORI	23264	0.20	8.00	17.73	4751.64	10530.83
222	SUSQUEHANNA	AFL	PA	MUN	HOLLIDAYSBURG BOROUGH	23493	1.19	8.00	12.76	28875.37	46056.21
223	SUSQUEHANNA	AFL	PA	MUN	DANVILLE MUN AUTH	23531	2.25	8.00	15.75	54826.65	107939.97
224	SUSQUEHANNA	AFL	PA	MUN	ASHLAND MUNICIPAL AUTHORITY	23558	0.63	2.08	13.76	3991.38	26404.51
225	SUSQUEHANNA	AFL	PA	MUN	TRI BORO MUNICIPAL AUTHORITY	23736	0.37	2.51	19.39	2813.46	21734.26
226	SUSQUEHANNA	AFL	PA	MUN	NORTHEASTERN YORK COUNTRY SEW.	23744	.	.	.	.	.
227	SUSQUEHANNA	AFL	PA	MUN	HIGHSPIRE STP	24040	0.85	1.56	17.20	4053.15	44688.59
228	SUSQUEHANNA	AFL	PA	MUN	PALMYRA BOROUGH AUTHORITY	24287	0.61	2.90	28.04	5405.91	52269.54
229	SUSQUEHANNA	AFL	PA	MUN	MUNCY BOROUGH MUNICIPAL AUTHOR	24325	1.18	6.50	18.76	23362.24	67427.03
230	SUSQUEHANNA	AFL	PA	MUN	CARLISLE SUBURBAN AUTHORITY	24384	0.53	2.00	20.90	3246.96	33930.69
231	SUSQUEHANNA	AFL	PA	MUN	MT CARMEL MUN SEW AUTH	24406	1.14	6.50	26.25	22570.30	91149.31
232	SUSQUEHANNA	AFL	PA	MUN	CURWENSVILLE MUNICIPAL AUTHORI	24759	0.60	9.50	20.90	17361.77	38195.90
233	SUSQUEHANNA	AFL	PA	MUN	SELINSGROVE BOROUGH	24791	1.50	8.00	20.90	36551.10	95489.75
234	SUSQUEHANNA	AFL	PA	MUN	UPPER ALLEN TOWNSHIP	24902	.	.	.	.	.
235	SUSQUEHANNA	AFL	PA	MUN	LOCK HAVEN CITY OF	25933	2.18	8.00	22.35	53120.93	148406.60
236	SUSQUEHANNA	AFL	PA	MUN	CARLISLE BOROUGH SEWER SYSTEM	26077	2.57	0.85	15.25	6653.82	119377.42
237	SUSQUEHANNA	AFL	PA	MUN	WYOMING VALLEY SANITARY AUTHOR	26107	22.60	5.43	14.91	373789.82	1026373.16
238	SUSQUEHANNA	AFL	PA	MUN	COLUMBIA WASTEWATER TREATMENT	26123	0.62	5.30	33.63	9928.19	62997.19
239	SUSQUEHANNA	AFL	PA	MUN	HUNTINGDON, BOROUGH OF	26191	1.76	6.20	11.17	33237.13	59880.45
240	SUSQUEHANNA	AFL	PA	MUN	DALLAS AREA MUNICIPAL AUTH.	26221	1.79	3.25	16.83	17719.67	91760.62

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241	SUSQUEHANNA	AFL	PA	MUN	UNIVERSITY AREA JT AUTH	26239	3.23	0.50	13.40	4919.17	131833.73
242	SUSQUEHANNA	AFL	PA	MUN	YORK SEWAGE WASTEWATER TRMT PL	26263	9.44	1.80	18.07	51761.84	519631.36
243	SUSQUEHANNA	AFL	PA	MUN	LEWISTOWN, BOROUGH OF	26280	1.62	8.00	20.47	39475.19	101007.14
244	SUSQUEHANNA	AFL	PA	MUN	CLEARFIELD MUN AUTH	26310	3.43	8.00	7.77	83580.18	81177.25
245	SUSQUEHANNA	AFL	PA	MUN	LOWER LACKAWANNA VALLEY SAN. A	26361	2.29	1.80	12.64	12555.30	88166.13
246	SUSQUEHANNA	AFL	PA	MUN	LEMOYNE BOROUGH MUNICIPAL AUTH	26441	1.31	2.00	25.12	7980.32	100232.86
247	SUSQUEHANNA	AFL	PA	MUN	DERRY TOWNSHIP MUN. AUTH.	26484	2.48	1.30	13.71	9820.06	103563.89
248	SUSQUEHANNA	AFL	PA	MUN	SCRANTON SEWER AUTH.	26492	13.50	4.28	11.70	175993.55	481103.85
249	SUSQUEHANNA	AFL	PA	MUN	SUNBURY CITY MUN AUTH	26557	3.50	8.00	17.73	85285.90	189014.88
250	SUSQUEHANNA	AFL	PA	MUN	MILLERSVILLE BORO OF	26620	0.59	7.50	28.62	13409.68	51171.36
251	SUSQUEHANNA	AFL	PA	MUN	NEW CUMBERLAND BORO AUTH-STP	26654	0.42	1.82	24.68	2333.85	31648.01
252	SUSQUEHANNA	AFL	PA	MUN	LANCASTER SEW. AUTH. NORTH STP	26719	8.70	2.92	11.50	77378.68	304744.80
253	SUSQUEHANNA	AFL	PA	MUN	TYRONE BOROUGH SEWER AUTH-STP	26727	5.00	0.50	3.53	7614.81	53760.58
254	SUSQUEHANNA	AFL	PA	MUN	SWATARA TOWNSHIP	26735	2.61	7.50	23.17	59578.29	184057.21
255	SUSQUEHANNA	AFL	PA	MUN	LANCASTER SEW AUTH SOUTH STP	26743	9.80	6.25	19.55	186562.91	583568.77
256	SUSQUEHANNA	AFL	PA	MUN	SPRINGETTSBURG	26808	9.25	3.30	16.57	92976.86	466856.54
257	SUSQUEHANNA	AFL	PA	MUN	HANOVER STP, BOROUGH OF	26875	2.66	8.70	19.98	70568.29	162063.74
258	SUSQUEHANNA	AFL	PA	MUN	GREATER HAZELTON SEWAGE TREATM	26921	6.27	4.28	13.10	81739.22	250183.14
259	SUSQUEHANNA	AFL	PA	MUN	PENNSYLVANIA STATE UNIVERSITY-	26999	3.05	1.50	20.90	13935.11	194162.49
260	SUSQUEHANNA	AFL	PA	MUN	ALTOONA CITY AUTHORITY-EASTERL	27014	4.97	5.00	14.06	75691.24	212843.76
261	SUSQUEHANNA	AFL	PA	MUN	ALTOONA CITY AUTHORITY-WESTERL	27022	6.67	5.00	20.90	101581.60	424611.08
262	SUSQUEHANNA	AFL	PA	MUN	WILLIAMSPORT SAN AUTH(WEST)	27049	2.67	8.00	17.27	65060.96	140450.34
263	SUSQUEHANNA	AFL	PA	MUN	WILLIAMSPORT SAN AUTH(CENTRAL)	27057	7.76	8.00	21.57	189091.02	509836.67
264	SUSQUEHANNA	AFL	PA	MUN	LACKAWANNA RIVER BASIN SEWER A	27065	2.59	3.42	10.30	27001.03	81318.89
265	SUSQUEHANNA	AFL	PA	MUN	LACKAWANNA RIVER BASIN SEWER A	27073	0.60	3.04	11.00	5527.99	20002.59
266	SUSQUEHANNA	AFL	PA	MUN	LACKAWANNA RIVER BASIN SEWER A	27081	0.40	2.68	15.79	3265.23	19238.06
267	SUSQUEHANNA	AFL	PA	MUN	LACKAWANNA RIVER BASIN SEWER A	27090	2.74	4.16	16.51	34718.67	137789.73
268	SUSQUEHANNA	AFL	PA	MUN	BLOOMSBURG MUN AUTH	27171	4.29	8.00	17.73	104536.15	231678.23
269	SUSQUEHANNA	AFL	PA	MUN	LOWER ALLEN TOWNSHIP AUTHORITY	27189	2.02	1.95	9.45	11997.90	58143.66
270	SUSQUEHANNA	AFL	PA	MUN	HARRISBURG SEWERAGE AUTHORITY-	27197	27.70	1.51	15.59	127401.90	1315361.39
271	SUSQUEHANNA	AFL	PA	MUN	LEBANON CITY AUTHORITY-SEWAGE	27316	3.98	1.40	24.23	16971.89	293735.00
272	SUSQUEHANNA	AFL	PA	MUN	SHAMOKIN-COAL TWP JT SAN AUTH	27324	3.32	6.50	17.50	65731.06	176968.24
273	SUSQUEHANNA	AFL	PA	MUN	EPHRATA BOROUGH WASTEWATER TRE	27405	2.49	1.45	22.82	10997.31	173074.94
274	SUSQUEHANNA	AFL	PA	MUN	PINE CREEK MA-STP	27553	1.01	6.50	14.65	19996.50	45069.03
275	SUSQUEHANNA	AFL	PA	MUN	BROWN TWP MUN AUTH-STP	28088	0.22	8.00	20.90	5458.30	14259.80
276	SUSQUEHANNA	AFL	PA	MUN	BELLWOOD BOROUGH (AUTHORITY)	28240	0.26	8.00	14.47	6408.63	11591.60
277	SUSQUEHANNA	AFL	PA	MUN	MARTINSBURG SEWAGE DISPOSAL PL	28347	0.62	6.50	13.16	12195.88	24691.97
278	SUSQUEHANNA	AFL	PA	MUN	MIFFLINBURG BOROUGH MUNICIPAL	28461	0.73	8.00	10.49	17788.20	23324.78
279	SUSQUEHANNA	AFL	PA	MUN	CLARKS SUMMIT-SOUTH ABINGTON J	28576	1.61	5.95	21.80	29178.44	106905.88
280	SUSQUEHANNA	AFL	PA	MUN	JERSEY SHORE, BOROUGH OF	28665	0.65	8.00	17.40	15838.81	34449.41

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APPENDIX 1. 1985 BASELINE POINT SOURCE NUTRIENT LOADS BY FACILITY (FACNAME) SORTED BY BASIN, STATE, FALLINE AND DISTYPE

OBS	BASIN	FALLINE	STATE	DISTYPE	FACNAME	NPDES	FLOW85	TP85	TN85	TPL85	TNL85
281	SUSQUEHANNA	AFL	PA	MUN	KELLY TWP MUN AUTH	28681	2.15	8.00	18.11	52389.91	118597.66
282	SUSQUEHANNA	AFL	PA	MUN	HAMPDEN TOWNSHIP SEWAGE TREATM	28746	1.03	2.04	12.67	6381.46	39633.85
283	SUSQUEHANNA	AFL	PA	MUN	SHIPPENSBURG BOROUGH AUTHORITY	30643	1.55	1.00	24.56	4721.18	115952.27
284	SUSQUEHANNA	AFL	PA	MUN	LOGAN TWP.(GREENWOOD AREA) S.T	32557	0.44	6.50	20.90	8612.35	27692.03
285	SUSQUEHANNA	AFL	PA	MUN	TOWANDA MUN AUTH	34576	0.66	8.00	19.40	16082.48	39000.02
286	SUSQUEHANNA	AFL	PA	MUN	PENN TOWNSHIP SEWAGE TREATMENT	37150	1.29	0.83	2.33	3253.69	9133.85
287	SUSQUEHANNA	AFL	PA	MUN	MOSHANNON VALLEY JT SAN AUTH	37966	1.37	8.00	12.75	33383.34	53204.69
288	SUSQUEHANNA	AFL	PA	MUN	EAST PENNSBORO SOUTH TREATMENT	38415	1.79	1.46	25.56	7964.67	139436.23
289	SUSQUEHANNA	AFL	PA	MUN	LANCASTER AREA SEWER AUTHORITY	42269	4.90	7.50	15.10	111937.74	225367.99
290	SUSQUEHANNA	AFL	PA	MUN	NEW FREEDOM WTP	43257	0.79	7.50	20.90	17955.73	50036.63
291	SUSQUEHANNA	AFL	PA	MUN	HOLLIDAYSBURG REGIONAL WWTP	43273	1.20	8.00	17.73	29240.88	64805.10
292	SUSQUEHANNA	AFL	PA	MUN	SAYRE	43681	1.09	9.50	40.98	31540.55	136055.99
293	SUSQUEHANNA	AFL	PA	MUN	WESTERN CLINTON CO MUN AUTH	43893	0.40	8.00	23.98	9746.96	29216.51
294	SUSQUEHANNA	AFL	PA	MUN	S MIDDLETON TWP MUNICIPAL AUTH	44113	0.27	0.98	24.56	802.97	20123.33
295	SUSQUEHANNA	AFL	PA	MUN	LEWISBURG AREA JT SA/COLLEGE P	44661	1.00	8.00	20.90	24367.40	63659.83
296	SUSQUEHANNA	AFL	PA	MUN	MOUNTAINTOP AREA WSTWTR TMT FA	45985	1.79	2.90	20.90	15811.40	113951.10
297	SUSQUEHANNA	AFL	PA	MUN	ST. JOHNS SEWER TREATMENT PLAN	46388	0.12	3.35	20.90	1173.44	7320.88
298	SUSQUEHANNA	AFL	PA	MUN	SHENANDOAH MUNICIPAL SEWAGE AU	70386	1.44	3.34	13.28	14649.68	58247.83
299	SUSQUEHANNA	AFL	PA	MUN	HAMPDEN TOWNSHIP SEWER AUTHORI	80314	1.16	2.00	14.41	7066.55	50914.46
300	W CHESAP	BFL	MD	IND	W R GRACE	311	2.35	0.30	460.69	2150.60	3302521.50
301	W CHESAP	BFL	MD	IND	EASTERN STAINLESS	981	0.69	0.10	33.66	209.20	70440.10
302	W CHESAP	BFL	MD	IND	BETHLEHEM STEEL	1201	163.67	0.28	16.08	138106.50	8018228.50
303	W CHESAP	BFL	MD	IND	CONGOLEUM	1384	0.28	0.18	0.50	155.50	431.80
304	W CHESAP	BFL	MD	IND	CHEMETALS	1775	0.66	0.02	158.66	40.40	320763.20
305	W CHESAP	BFL	MD	MUN	MARYLAND MINORS (50), SUM	.	3.61	5.47	17.11	60077.10	187897.90
306	W CHESAP	BFL	MD	MUN	APG - EDGEWOOD	21229	1.25	0.87	7.28	3310.00	27835.60
307	W CHESAP	BFL	MD	MUN	APG - ABERDEEN	21237	1.12	2.39	16.94	8137.90	57609.70
308	W CHESAP	BFL	MD	MUN	FREEDOM DISTRICT	21512	1.30	5.14	4.62	20324.30	18259.10
309	W CHESAP	BFL	MD	MUN	BACK RIVER	21555	67.69	1.81	22.22	372513.20	4581865.80
310	W CHESAP	BFL	MD	MUN	ABERDEEN	21563	1.09	0.35	18.00	1151.00	59535.00
311	W CHESAP	BFL	MD	MUN	PATAPSCO	21601	41.36	3.43	17.58	432404.30	2215242.00
312	W CHESAP	BFL	MD	MUN	BROADNECK	21644	3.18	5.81	24.28	56297.50	235146.50
313	W CHESAP	BFL	MD	MUN	COX CREEK	21661	9.26	1.75	19.48	49383.50	549838.70
314	W CHESAP	BFL	MD	MUN	PINE HILL RUN	21679	1.88	6.01	15.18	34506.50	87154.80
315	W CHESAP	BFL	MD	MUN	HAVRE DE GRACE	21750	1.48	4.77	22.39	21517.20	100924.10
316	W CHESAP	BFL	MD	MUN	ANNAPOLIS	21814	6.23	2.70	11.55	51169.30	219230.50
317	W CHESAP	BFL	MD	MUN	JOPPATOWNE	22535	0.72	6.60	18.00	14391.00	39274.30
318	W CHESAP	BFL	MD	MUN	BROADWATER	24350	.	.	.	.	.
319	W CHESAP	BFL	MD	MUN	SOD RUN	56545	5.74	1.32	27.09	23106.30	473918.20
320	YORK	AFL	VA	MUN	GORDONSVILLE STP	21105	0.55	6.40	18.70	10715.23	31308.57

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321	YORK	AFL	VA	MUN	ASHLAND STP	24899	0.86	4.70	13.39	12304.25	35054.00
322	YORK	AFL	VA	MUN	DOSWELL STP	29521	0.29	2.89	18.70	2551.00	16508.15
323	YORK	AFL	VA	MUN	CAROLINE CO. REGIONAL STP	73504	0.00	0.00	0.00	0.00	0.00
324	YORK	BFL	VA	IND	AMOCO - YORKTOWN	3018	1.43	0.51	36.24	2220.00	157755.00
325	YORK	BFL	VA	IND	CHESAPEAKE CORP.-WEST PT.	3115	13.68	5.80	14.08	241531.00	586337.00
326	YORK	BFL	VA	MUN	WEST POINT STP	22195	0.50	6.40	18.70	9741.12	28462.34
327	YORK	BFL	VA	MUN	HRSD-YORK STP (OLD VA0064238)	81311	7.36	6.79	21.51	152127.00	481922.00

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