Survey of Industrial Pretreatment Programs in the Potomac River Basin

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National Pretreatment Program Requirements

The Clean Water Act of 1972 called for EPA to develop national pretreatment standards to control industrial discharges into sewage systems. All POTWs must enforce federal standards, which restrict the level of certain pollutants in industrial wastestreams. The federal standards are based upon the following rules:

1) Categorical Pretreatment Standards are established for certain categories of industry (See Table I-1). Different requirements are mandated for each industry. Categorical standards place restrictions on discharges containing 126 toxic pollutants listed in Table I-2. EPA indentified these compounds as having the greatest potential to harm human health or the environment. Categorical standards may require that industrial facilities reduce their discharges of these toxic substances by 80 percent or more.

2) Significant Industrial Users must comply with applicable pretreatment standards through permits or contracts, which contain effluent limits based on categorical standards, local limits, or state or local law. A Significant Industrial User is defined as: (a) any industrial user subject to Categorical Pretreatment Standards, (b) a user discharging an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding noncontact cooling and boiler blowdown) or (c) a user contributing a process wastestream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant, or (d) an industrial user that, according to the Control Authority, could adversely affect the POTW's operation.

(3) Prohibited Discharge Standards prohibit any discharge of certain wastes to sewer systems. Prohibited discharges are listed in Table I-3.

National standards ensure that all sewage districts control toxic discharges of industrial facilities to certain minimum levels, even when there is political pressure to relax pollution control requirements for facilities that provide local jobs.

Local Programs

The National Pretreatment Program consists of approximately 1,500 local programs designed to meet federal requirements and to accommodate unique local concerns. Pretreatment regulations require all large POTWs (design flow > 5 mgd) and small POTWs with Significant Industrial Dischargers to establish local pretreatment programs. In addition to enforcing all national

Table I-1 Categorical Pretreatment Standards

Industry Category	Date Standard was Issued in *Federal Register*	Effective Date	Compliance Date for Existing Sources[a]
Timber Products	1-26-81	3-30-81	1-26-84
Electroplating	1-28-81	3-30-81	4-27-84 (Non-integrated)[b] 6-30-84 (Integrated)[b]
	7-15-83	8-29-83	7-15-86 (TTO)[b]
Iron and Steel	5-27-82	7-10-82	7-10-85
Inorganic Chemicals I	6-29-82	8-12-82	8-12-85
Textile Mills	9-2-82	10-18-82	—[c]
Petroleum Refining	10-18-82	12-1-82	12-1-85
Pulp, Paper, Paperboard	11-18-82	1-3-83	7-1-84
Steam Electric	11-19-82	1-2-83	7-1-84
Leather Tanning	11-23-82	1-6-83	11-25-85
Porcelain Enameling	11-24-82	1-7-83	11-25-85
Coil Coating I	12-1-82	1-17-83	12-1-85
Electrical and Electronic Components I	4-8-83	5-19-83	7-1-84 (TTO)[d] 11-8-85 (As)[d]
Metal Finishing	7-15-83	8-29-83	6-30-84 (Part 433, TTO)[e] 7-10-85 (Part 420, TTO)[e] 2-15-86 (Final)[e]
Copper Forming	8-15-83	9-26-83	8-15-86
Aluminum Forming	10-24-83	12-7-83	10-24-86
Pharmaceuticals	10-27-83	12-12-83	10-27-86
Coil Coating (Canmaking)	11-17-83	1-2-84	11-17-86
Electrical and Electronic Components II	12-14-83	1-27-84	7-14-86
Non-Ferrous Metals I	3-8-84	4-23-84	3-9-87
Battery Manufacturing	3-9-84	4-23-84	3-9-87
Inorganic Chemicals II	8-22-84	10-5-84	6-29-85 ($CuSO_4$, $NiSO_4$) 8-22-87
Plastics Molding and Forming	12-17-84	1-30-85	—[c]
Non-Ferrous Metals Forming	8-23-85	10-7-85	8-23-88
Non-Ferrous Metals II	9-20-85	11-4-85	9-20-88
Pesticides	10-4-85	11-18-85	11-18-88
Metal Molding and Casting (Foundries)	10-30-85	12-13-85	10-31-88
Organic Chemicals and Plastics and Synthetic Fibers	12/86	2/87	2/90

[a] The compliance date for any new source is the same date as the commencement of the discharge.

[b] Integrated electroplators are establishments involved both in electroplating and in other activities that are regulated by other EPA categorical pretreatment standards. Non-integrated electroplators are establishments involved in electroplating only. The compliance date for removal of total toxic organics (TTO) is July 15, 1986.

[c] No numerical pretreatment limits have been established for these industrial categories, and there is no final compliance date for categorical pretreatment standards. Firms in these categories are required to comply only with the General Pretreatment Regulations in 40 CFR 403.

[d] The compliance date for existing Phase I Electrical and Electronic Components manufacturers for TTO is July 1, 1984. The compliance date for arsenic is November 8, 1985.

[e] Existing sources that are subject to the metal finishing standards in 40 CFR Part 433 must comply only with the interim limit for Total Toxic Organics (TTO) by June 30, 1984. Plants also covered by 40 CFR Part 420 must comply with the interim TTO limit by July 10, 1985. The compliance date for metals, cyanide, and final TTO is February 15, 1986, for all sources.

Table I-2 Toxic Pollutants Regulated Under Categorical Standards

1. acenaphthene
2. acrolein
3. acrylonitrile
4. benzene
5. benzidine
6. carbon tetrachloride
7. chlorobenzene
8. 1,2,4-trichlorobenzene
9. hexachlorobenzene
10. 1,2-dichloroethane
11. 1,1,1-trichloroethane
12. hexachloroethane
13. 1,1-dichloroethane
14. 1,1,2-trichloroethane
15. 1,1,2,2-tetrachloroethane
16. chloroethane
17. bis(2-chloroethyl) ether
18. 2-chloroethyl vinyl ether (mixed)
19. 2-chloronaphthalene
20. 2,4,6-trichlorophenol
21. parachlorometa cresol
22. chloroform (trichloromethane)
23. 2-chlorophenol
24. 1,2-dichlorobenzene
25. 1,3-dichlorobenzene
26. 1,4-dichlorobenzene
27. 3,3-dichlorobenzidine
28. 1,1-dichloroethylene
29. 1,2-trans-dichloroethylene
30. 2,4-dichlorophenol
31. 1,2-dichloropropane
32. 1,2-dichloropropylene (1,3-dichloropropene)
33. 2,4-dimethylphenol
34. 2,4-dinitrotoluene
35. 2,6-dinitrotoluene
36. 1,2-diphenylhydrazine
37. ethylbenzene
38. fluoranthene
39. 4-chlorophenyl phenyl ether
40. 4-bromophenyl phenyl ether
41. bis(2-chloroisopropyl) ether
42. bis(2-chloroethoxy) methane
43. methylene chloride (dichloromethane)
44. methyl chloride (chloromethane)
45. methyl bromide (bromomethane)
46. bromoform (tribromomethane)
47. dichlorobromomethane
48. chlorodibromomethane
49. hexachlorobutadiene
50. hexachlorocyclopentadiene
51. isophorone
52. naphthalene
53. nitrobenzene
54. 2-nitrophenol
55. 4-nitrophenol
56. 2,4-dinitrophenol
57. 4,6-dinitro-o-cresol
58. N-nitrosodimethylamine
59. N-nitrosodiphenylamine
60. N-nitrosodi-n-propylamine
61. pentachlorophenol
62. phenol
63. bis(2-ethylhexyl) phthalate
64. butyl benzyl phthalate
65. di-n-butyl phthalate
66. di-n-octyl phthalate
67. diethyl phthalate
68. dimethyl phthalate
69. benzo(a)anthracene (1,2-benzanthracene)
70. benzo(a)pyrene (3,4-benzo-pyrene)
71. 3,4-benzofluoranthene (benzo(b)fluoranthene)
72. benzo(k)fluoranthene (11,12-benzofluoranthene)
73. chrysene
74. acenaphthylene
75. anthracene
76. benzo(ghi)perylene (1,12-benzoperylene)
77. fluorene
78. phenanthrene
79. dibenzo(ah)anthracene (1,2,5,6-dibenzanthracene)
80. indeno (1,2,3-cd)pyrene (2,3-o-phenylenepyrene)
81. pyrene
82. tetrachloroethylene
83. toluene
84. trichloroethylene
85. vinyl chloride (chloroethylene)
86. aldrin
87. dieldrin
88. chlordane (technical mixture & metabolites)
89. 4,4-DDT
90. 4,4-DDE (p,p-DDX)
91. 4,4-DDD (p,p-TDE)
92. Alpha Endosulfan
93. Beta Endosulfan
94. endosulfan sulfate
95. endrin
96. endrin aldehyde
97. heptachlor
98. heptachlor epoxide (BHC-hexachlorocyclohexane)
99. Alpha-BHC
100. Beta-BHC
101. Gamma-BHC (lindane)
102. Delta-BHC (PCB-polychlorinated biphenyl)
103. PCB-1242 (Arochlor 1242)
104. PCB-1254 (Arochlor 1254)
105. PCB-1221 (Arochlor 1221)
106. PCB-1232 (Arochlor 1232)
107. PCB-1248 (Arochlor 1248)
108. PCB-1260 (Arochlor 1260)
109. PCB-1016 (Arochlor 1016)
110. toxaphene
111. antimony (total)
112. arsenic (total)
113. asbestos (total)
114. beryllium (total)
115. cadmium (total)
116. chromium (total)
117. copper (total)
118. cyanide (total)
119. lead (total)
120. mercury (total)
121. nickel (total)
122. selenium (total)
123. silver (total)
124. thallium (total)
125. zinc (total)
126. 2,3,7,8 tetrachlorodibenzo-o-dioxin (TCDD)

Table I-3. National Pretreatment Standards: Specific Prohibitions

The following shall not be introduced into a POTW:

1) Pollutants which create a fire or explosion hazard in the POTW

2) Pollutants which will cause corrsive structural damage to the POTW; in no case discharges with pH lower than 5.0, unless the works is specifically designed to accommodate such discharges.

3) Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW resulting in interference.

4) Any pollutant, including oxygen demanding pollutants released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.

5) Heat in amounts which will inhibit biological activity in the POTW resulting in interference; in no case heat in such quantities that the temperature at the POTW treatment plant exceeds 40 degrees Centigrade.

6) Each POTW developing a POTW Pretreatment Program shall develop and enforce specific limits to implement these prohibitions.

Source: 40 CFR Part 403

pretreatment standards, the local POTWs may also establish and enforce more stringent local limits, based on the plant design, conditions, and treatment processes. Establishment of local limits is based on possible interference of toxics with the treatment process, sludge contamination, NPDES permit violations, surface water impacts, and worker safety. To determine local limits, the POTW must estimate the maximum concentration of each pollutant in the incoming wastewater that will not cause any of these problems. It then calculates the maximum pollutant loading of each user that can be allowed without exceeding the maximum concentration of pollutants arriving at the treatment plant.

While complying with national requirements, municipalities developing pretreatment programs have recognized local concerns. Many factors, including industry type, community-industry relations, wastewater treatment plant capacity, and the actual treatment process, influence the formation of pretreatment agreements.

Small wastewater treatment plants with limited resources and expertise may find developing pretreatment programs a difficult and complex task requiring technical expertise. These plants often require support from the state or other resources (Jolene Chinchilli, Chesapeake Bay Foundation, personal communication). The locality may also encounter difficulties enforcing pretreatment requirements if the industry is an vital employer in the area.

The establishment of Categorical Pretreatment Standards, local limits, and reporting requirements do not always prevent accidental spills or irregular high strength batch discharges of toxic wastes (called slug loadings) from arriving at the POTW, according to the Domestic Sewage Study. EPA requires the POTWs to assess the potential for interference or pass-through, and take appropriate measures to minimize impacts to the treatment works and the environment.

Program Approval

Because POTWs are direct dischargers, they must obtain and comply with a NPDES (National Pollutant Discharge Elimination System) permit. The National Pretreatment program requires many POTWs to establish pretreatment programs for permit renewal. Local limits for industrial discharges to a sewage treatment system are written into the plant's NPDES permit. Therefore, municipalities with pretreatment programs are considered "mini-states" which oversee the NPDES permit.

II. Pretreatment Programs in the Potomac River Basin

Industrial facilities discharge wastewater to municipal treatment plants throughout the Potomac River Basin. Pretreatment programs have been developed in the basin: seven in Maryland, nine in Virginia, and one in the District of Columbia. Under these programs, 225 industries discharge wastewater to 25 publicly owned treatment plants within the Potomac watershed. POTWs with pretreatment programs, their flow capacities, proportion of industrial flow, and industrial users are listed by basin region in Table II-1.

Smaller wastewater treatment plants (less than 10 mgd) with pretreatment programs are located in the Piedmont and Shenandoah portions of the Potomac River Basin. With the exception of the Cumberland plant (15 mgd), the eight larger POTWs are clustered in the urban or lower estuarine portion of the Potomac watershed. The District of Columbia's Blue Plains wastewater treatment plant with a flow of 309 mgd dwarfs other plants both in terms of capacity and its 86 industrial users.

Although national pretreatment requirements have targeted large municipalities with numerous industrial polluters, many small treatment plants have also developed excellent pretreatment programs. Pretreatment can be more critical at smaller plants, where industrial waste impacts plant operations and the receiving stream more heavily. Some smaller plants still need to develop industrial pretreatment, according to John Lavelle, EPA Region III Pretreatment Coordinator.

While pretreated industrial discharge makes up less than 5% of the total flow at most of the wastewater plants in the Potomac Basin, four small plants receive a large industrial discharge (up to 15 to 25%): the Ballenger Creek and Frederick City plants in the Piedmont, the Hagerstown plant in the Upper Great Valley, and the Harrisonburg-Rockingham plant in the Shenandoah region of the basin.

Chemical Loading of POTWs from Industrial Facilities

The types of industries releasing wastewater to treatment facilities indicate the kinds of pollutants entering from industrial sources (See Table II-2). Food industries, including fruit processors, bakeries, dairies, and meat processors, discharge oxygen-demanding substances, nutrients, acids or bases, and oil and grease. The remaining industries discharge potentially toxic metals or organics.

Table II-1. Municipal Treatment Plants with Pretreatment Programs in the Potomac River Basin and Their Industrial Dischargers

POTOMAC HIGHLANDS

Cumberland	15	mgd	3.80	% Industrial Flow

CSX Transportation	Railroad
Sacred Heart Hospital	Hospital
Memorial Hospital	Hospital

UPPER GREAT VALLEY

Frederick/Winchester	5	mgd	5	% Industrial Flow

Abex	Brake Linings Manuf
Amoco Foam Products	Plastics Manufacture
Ashworth Brothers	Metal Conveyor Belt Manuf
Crown Cork & Seal Co., Inc.	Aluminum plate/metal fabricat.
General Electric Co	Incandescent Lamp Manuf
Mono-Flo	Plastics Manufacture
Moxon Timbers, Inc.	Lumber
National Fruit Product Co.	Processed Fruit Products
O'Sullivan Corporation	Plastics Manufacture
P.W. Plumly Lumber Co	Lumber
Rich Products, Inc.	Bakery
Rubbermaid Commercial Products	Plastics Manufacture
Winchester Medical Center	Hospital
Zeropack Co.	Processed Fruit Products

Hagerstown	8	mgd	12.50	% Industrial Flow

Gold Bond	Food Processor
Columbo	Food Processor
Jefferson Cheese	Food Processor
Mack Truck	Metal Finishing
EM Corp	Metal Finishing
Maryland Ribbon	Ribbon Manufacturer

SHENANDOAH

Fishersville	2	mgd	12.30	% Industrial Flow

Hall Industries, Inc.	Machinery
Objective Industries	Machinery
Penny Plate of Virginia, Inc.	Fabricated Metal Products
Red Mill Manufacturing	Concrete Products
Thurston Motor Lines	Trucking
United Parcel Service	Trucking
Valley V-Tech Center	Educational Service
Augusta Coop Farm Bureau, Inc	Educational Service

Table II-1. Municipal Treatment Plants with Pretreatment Programs in the Potomac River Basin and Their Industrial Dischargers

Western State Hospital	Hospital		
Wilson Trucking Co	Trucking		
Woodrow Wilson Rehab Center	Hospital		
Harrisonburg-Rockingham	8 mgd	35	% Industrial Flow
AMP, Inc	Metal Finishing		
Dunham-Bush, Inc	Metal Finishing		
Kawneer Co., Inc.	Aluminum Forming		
Packaging Corp. of America	Packaging		
Mt. Sydney	0.80 mgd	3.10	% Industrial Flow
Staunton Plaza	0.20 mgd	26.40	% Industrial Flow
Central Cocal-Cola Bottling	Bottling		
Stuarts Draft	0.40 mgd	20.10	% Industrial Flow
Hollister, Inc.	Plastics Manufacture		
P.T. Components	Machinery		
Hershey Chocloate Co	Food Processor		
Mastic	Petroleum Refining		
Verona	0.80 mgd	28.20	% Industrial Flow
McKee Baking Co	Bakery		
NIBCO, Inc.	Metal Products, Fabricated		
American Safety Razor	Metal Products, Fabricated		
Augusta Steel	Lumber, Plywood, Millwork		
Carded Graphics	Paper Products		
Central Transport	Trucking		
Davi Communications, Inc.	Heavy Construction		
Dixie Gas and Oil Co	Petroleum Bulk Station		
Dod Distribution Co., Inc.	Beer & Ale		
Dr. Pepper Bottling Co.	Bottling		
The Grief Cos./Genesco, Inc.	Apparel & Finished Fabrics		
Homestead Material Handling Co	Industrial Machinery		
John D. Eiland Co., Inc.	Beer & Ale		
Liphart Steel Co., Inc.	Metal Products, Fabricated		
Mid Valley Press Inc.	Printer		
Neuman USA Ltd.	Metal Industry, Primary		
William Edwards, Inc.	Trucking		
Snyder General	Heating, Air Conditioning Manu		
Waynesboro	4 mgd		
Industrial Machine Works	Electroplating		

Table II-1. Municipal Treatment Plants with Pretreatment Programs in the Potomac River Basin and Their Industrial Dischargers

Virginia Panel Corp	Metal Finishing
Virginia Metalcrafters	Metal Finishing
Genicom Corp	Metal Finishing
Augusta Hospital Corp	Hospital
Stanley Furniture Company	Furniture Manufacturing
Weyers Cave	0.80 mgd 12.60 % Industrial Flow
AMP, Inc	Tool Manufacturer
Blue Ridge Community College	Educational Service
Capitol Printing Ink Co.	Chemical
Packaging Services, Inc.	Packaging
Shenandoah Valley Pepsi	Bottling
Sunlite Plastics	Plastics Manufacture
W.C. Sales	
Cerro Metal Products	Metal Products, Fabricated
DeGesch America, Inc.	Chemical

PIEDMONT

Ballenger Creek	2 mgd 28 % Industrial Flow
Rotorex	Metal Finishing
M.A. Bioproducts	Pharmaceutical
Metalfab	Metal Finishing
S.B. Thomas	Bakery
Hemps Meats, Inc.	Food Processor
Solorex	Electronics
Damascus	0.90 mgd 5 % Industrial Flow
Frederick City	7 mgd 15 % Industrial Flow
High's Dairy	Dairy
Clorox	Bleach Manuf.
Airpax	Metal Finishing
General Cable	Metal Finishing
Airflow	Metal Finishing
P.A.M. Engineering	Metal Finishing
Leesburg	2.50 mgd
New Market	0.06 mgd 1 % Industrial Flow
Hahn Transportation	Trucking

Table II-1. Municipal Treatment Plants with Pretreatment Programs in the Potomac River Basin and Their Industrial Dischargers

Seneca Creek	5	mgd	2	% Industrial Flow

URBAN

Alexandria	54	mgd	2	% Industrial Flow

Omega Circuits	Electroplating
Times Journal	Newspaper,photo
Versar	Research Laboratory
Washington Post	Newspaper,photo
Delta Electronics	Metal Finishing
E-Systems, Melpar Division	Metal Finishing
Omega Circuits	Electroplating
Fairfax Hospital	Hospital
The Times Journal	Newspaper
Versar, Inc.	Research Laboratory
The Washington Post	Newspaper
The Alexandria Hospital	Hospital
Qualex, Inc.	
National Linen Services	Industrial Laundry
Ogden Martin Systems	
Star Enterprise	

Arlington	54	mgd	2	% Industrial Flow

Coca-Cola	Bottling
Pentagon Facilities	Boiler blowdown, photo, food
Washington Natl Airport	Airport, oils/solvents

Blue Plains	365	mgd

Industries in Maryland Discharging to Blue Plains
Washington Suburban Sanitary Commission

Abercrombie & Co.	Metal Finishing
A G & M Machine Shop	Metal Finishing
BTI Systems, Inc.	Metal Finishing
Bethesda Art Metal Works, Inc.	Metal Finishing
Chevy Chase Plating & Polishin	Metal Finishing
EMDS, Gaithersburg, MD	Metal Finishing
JDF Manufacturing, Beltsville	Metal Finishing
Litton Amecom, College Park	Metal Finishing
Mid-Atlantic Finishing, Inc.	Metal Finishing
Smithsonian Institute	Metal Finishing
Solarex Corp, Rockville	Metal Finishing & Electronics
Vitro Labs, Silver Spring, MD	Metal Finishing
District Photo, Inc.	Photoprocessing
Duron Paint, Inc.	Paint Manufacturer
Genex Corp	Research Laboratory

Table II-1. Municipal Treatment Plants with Pretreatment Programs in the Potomac River Basin and Their Industrial Dischargers

Giant Food Dairy	Dairy
Hazelton Labs	Research Laboratory
Heidi Bakery	Bakery
Hills of Westchester	Bakery/Candy Factory
Ionpure	Ion Exchange Regeneration
Kodalux	Photoprocessing
Life Technologies, Inc.	Research Laboratory
Mash's Food, Inc.	Food Processor
Mid-Atlantic Coca-Cola	Bottling
Mineral Pigments Corporation	Pigment Production
Montgomery Donuts	Bakery
National Institutes of Health	Federal Facility
Naval Surface Warfare Center	Federal Facility
NuTech Laundry and Textiles	Industrial Laundry
Organon Teknika Corp	Research Laboratory
Otsuka Pharmaceutical	Research Laboratory
Pepsi-Cola Bottling Co.	Bottling
Safeway Bakery/Dairy	Bakery/dairy
Safeway Ice Cream	Food Processor
UniFirst	Industrial Laundry
University of Maryland	Research Laboratory
Virginia Linen Service	Industrial Laundry

Industries in the District of Columbia Discharging to Blue Plains

Washington Plating Corporation	Metal Finishing
Naval Research Laboratory	Research Laboratory
Solid Waste Reduction Center	Incinerator
Wash Metro Trans Auth 14th St	Passenger Transit
Sterling Textile Services	Personal Services
AMTRAK	Railroad
Washington Times	Newspaper
Washington Post NW Plant	Newspaper
Washington Post SE Plant	Newspaper
Bureau of Printing & Engraving	Printer
Government Printing Office	Printer
GSA Central Heating Plant	Electric, Gas, & Sanitary
GSA West Heating Plant	Electric, Gas, & Sanitary
Smithsonian Institution	Restaurant, Business, Museum
U.S. Capitol Power Plant	Electric, Gas, & Sanitary
Art Display Co.	Paper Products
Capitol Chemical Ind., Inc.	Chemical
Washington Dulles Internationa	Airport
David Taylor Research center	Research Laboratory
Palace Laundry Inc.	Industrial Laundry
Washington Gas Light Company	Electric, Gas, & Sanitary
Steuart Petroleum	Petroleum Bulk Station
Woodward & Lothrop Inc.	
Marshall Bldg Ltd Partnership	
Chevron U.S.A., Inc.	Petroleum Bulk Station
Washington Engraving & Plating	Electroplating
Watergate Management Co.	Groundwater Remediation
Amoco Oil Company, Blair Rd	Petroleum Bulk Station
Exxon Company, USA Macarthur B	Petroleum Bulk Station
Exxon Company, USA. Pa Ave	Petroleum Bulk Station

Table II-1. Municipal Treatment Plants with Pretreatment Programs in the Potomac River Basin and Their Industrial Dischargers

Amoco Oil Company, 14th St	Petroleum Bulk Station
Wash Metro Trans Auth Wisc Ave	Passenger Transit
Wash Metro Trans Auth M St, SE	Passenger Transit
Wash Metro Trans Auth Bladensb	Passenger Transit
Capitol Printing Ink Co., Inc	Chemical
IBM	

Industries in Virginia Discharging to Blue Plains

Atlantic Research Corp	Research Laboratory
Delta Electronic	Metal Finishing
E-Systems, Melpar Div.	Metal Finishing
Fairfax Hospital	Hospital
Central Intelligence Agency	Photoprocessing
Fairfax County Water Authority	Acid Cleaning
Hazleton Laboratories	Research Laboratory
Reston Hospital	Hospital
United States Geological Surv	Photoprocessing

Little Hunting Creek 6.60 mgd

Mount Vernon Hospital	Hospital

Piscataway 30 mgd 10 % Industrial Flow

Andrews AFB-West	Federal Facility
State Groundwater Project	Groundwater Remediation

LOWER ESTUARY

Lower Potomac Poll Contrl 54 mgd 2 % Industrial Flow

Alexandria Metal Finishers	Metal Finishing
Dynatech Data Sustems	Metal Finishing
I-95 Energy/Resource Recovery	Incinerator
LogEtronics, Inc.	Metal Finishing
RC-7Up Bottling Company	Bottling
S.T. Research Corp.	Metal Finishing
Shenandoah's Pride Dairy	Dairy
TEK AM Corporation	Metal Finishing
Fairfax Hospital	Hospital
TRW, Inc.	Metal Finishing
Virginia Stripper, Inc.	Furniture Refinishing

Mattawoman 10 mgd 2.50 % Industrial Flow

Embassy Dairy	Dairy
Beretta	Metal Finishing

Table II-1. Municipal Treatment Plants with Pretreatment Programs in the Potomac River Basin and Their Industrial Dischargers

Upper Occoquan 22.50 mgd 2 % Industrial Flow

Fair Oaks Hospital	Hospital
Hoppmann Corp.	Metal Finishing
Atlantic Research Corp.	Cooling tower blowdown
IBM, Inc.	Electronics
Manassas Ice & Fuel Co	Ice, Fuel oil
Virginia Anodizing & Plating	Electroplating, Metal finisher

Table II-2. Types and number of industries discharging wastewater to POTWs in the Potomac River Basin

Industrial Type	Number
Acid Cleaning	1
Airport	1
Airport, oils/solvents	1
Aluminum Forming	1
Aluminum plate/metal fabricat.	1
Apparel & Finished Fabrics	1
Bakery	5
Bakery/Candy Factory	1
Bakery/dairy	1
Beer & Ale	2
Bleach Manuf.	1
Boiler blowdown, photo, food	1
Bottling	7
Brake Linings Manuf	1
Chemical	4
Concrete Products	1
Cooling tower blowdown	1
Dairy	4
Educational Service	3
Electric, Gas, & Sanitary	4
Electronics	2
Electroplating	4
Electroplating, Metal finisher	1
Fabricated Metal Products	1
Federal Facility	3
Food Processor	7
Furniture Manufacturing	1
Furniture Refinishing	1
Groundwater Remediation	3
Heating, Air Conditioning Manu	1
Heavy Construction	1
Hospital	14
Ice, Fuel oil	1
Incandescent Lamp Manuf	1
Incinerator	3
Industrial Laundry	5
Industrial Machinery	1
Ion Exchange Regeneration	1
Lumber	2
Lumber, Plywood, Millwork	1
Machinery	3
Metal Conveyor Belt Manuf	1
Metal Finishing	44
Metal Finishing & Electronics	1
Metal Industry, Primary	1
Metal Products, Fabricated	4
Newspaper	5
Newspaper,photo	2
Packaging	2

Table II-2. Types and Number of Industries Discharging Wastewater to POTWs in the Potomac River Basin

Industrial Type	Number
Paint Manufacturer	1
Paper Products	2
Passenger Transit	4
Personal Services	1
Petroleum Bulk Station	7
Petroleum Refining	1
Pharmaceutical	1
Petroleum Refining	1
Pharmaceutical	1
Photoprocessing	6
Pigment Production	1
Plastics Manufacture	6
Printer	3
Processed Fruit Products	2
Railroad	2
Research Laboratory	12
Restaurant, Business, Museum	1
Ribbon Manufacturer	1
Tool Manufacturer	2
Trucking	6

Categorical standards for metal finishers and electronics manufacturers, listed in Table II-3, demonstrate types of chemicals discharged by these industries.

Local limits also define the chemicals released by regional industries and indicate maximum levels allowed in the wastestream. Local limits are designed for the number and type of industrial users, the particular wastestream volume, plant capacity, and treatment process. Table II-4 compares local limits established by pretreatment programs in the Potomac River Basin. Note that due to the higher dilution factor at Blue Plains, local limits established by the Washington Suburban Sanitary Commission are higher than those of other programs.

Detailed data for three dischargers to Blue Plains Wastewater Treatment Plant in 1990 illustrate chemical loadings for industries of different types and sizes (See Appendix A).

Comparison of Toxic Release and Pretreatment Information

The Toxic Release Inventory, a major component of the community right-to-know amendments to the Superfund law, is a listing of hazardous emissions to the environment from large production facilities. Under this requirement, owners and operators of facilities that have 10 or more employees, are in Standard Industrial Classification (SIC) codes 20 throught 39 (i.e. manufacturing facilities), **and** process or use a listed toxic chemical in excess of specified threshold quantities report estimated emissions to the EPA. Reporting is entirely voluntary. Over 300 chemicals comprise the list of hazardous substances. Any company that used more than 10,000 pounds or manufactured more than 50,000 pounds of a listed chemical in 1988 was required to report the annual load to air, land, and water.

While the Toxic Release Inventory requires facilities that produce or use potentially toxic chemicals to report emissions, pretreatment requirements are based on pollutant loadings and possible adverse effects to POTWs. Thus, facilities that process chemical substances but do not manufacture products, including hospitals, research laboratories, laundries, photoprocessors, and pollution control operations, do not report emissions to the TRI. In addition, federal facilities are exempt from TRI reporting requirements. Table II-5 shows how toxic releases to POTWs (from the 1988 TRI) and permitted industrial dischargers in pretreatment programs overlap; neither list encompasses the other. The omission of numerous metal finishers from the TRI list is unexplained.

Table II-3. Categorical Pretreatment Standards

Metal Finishing (40 CFR 433)

New Sources

Pollutant	Daily Maximum (mg/l)	Monthly Average (mg/l)
Cadmium	0.11	0.07
Chromium	2.77	1.71
Copper	3.38	2.07
Lead	0.69	0.43
Nickel	3.98	2.38
Silver	0.43	0.24
Zinc	2.61	1.48
Cyanide, Total	1.20	0.65
Total Toxic Organics	2.13	

Existing Sources
(Same limits except for Cadmium apply)

Cadmium	0.69	0.26

Electroplating (40 CFR 413)

Limits for Facilities Discharging > 10,000 gpd
Process Wastewater

Cadmium	1.2	0.7
Chromium	7.0	4.0
Copper	4.5	2.7
Lead	0.6	0.4
Nickel	4.1	2.6
Zinc	4.2	2.6
Total Metals	10.5	6.8
Cyanide, Total	1.9	1.0
Total Toxic Organics	2.13	

Limits for Facilities Discharging < 10,000 gpd
Process Wastewater

Pollutant	Daily Maximum (mg/l)	4-Day Average (mg/l)
Cyanide, A*	5.0	2.7
Lead	0.6	0.4
Cadmium	1.2	0.7
Total Toxic Organics	4.57	

* Amenable to chlorination

Table II-4. Local Limits of Industrial Dischargers in Pretreatment Programs in the Potomac River Basin

Program	Status	As	Cd	Cr (T)	Cu	Fe	Pb	Hg	Ni	Ag	Zn	CN	Phenols	TTO
Cumberland	In revision		0.006	1.20	0.15		0.11		0.075		0.41			
Frederick/Winchester	Being approved													
Hagerstown*		1.00	0.100	1.00	0.50	5.0	0.50	0.0100	1.000	0.50	1.00	0.50	0.10	
Harrisonburg-Rockingham	Conventional only													
Waynesboro	Indust Machine			9.32	5.41				4.61		11.80	1.17		
Waynesboro	Virginia Panel			2.18	1.26				1.08	0.11				
Waynesboro	Va Metalcrafters			2.77	2.33				1.99	0.20		0.50		
Waynesboro	Genicom Corp											1.06		
Frederick City		3.94	0.310	0.41	0.30		0.82	0.0036	3.980	0.09	2.89	0.34		2.13
WSSC			1.300	7.00	4.50		0.70		4.100	1.20	4.20	1.30		2.13
District of Columbia	Individual Permits													
Arlington														
Alexandria														
Lower Potomac Poll Contrl														
Upper Occoquan														
Charles County		3.45	1.370	1.78	2.14		5.01	0.0080	36.940	0.45	1.21	0.94		

Hagerstown- Additional Limits

	Sb	5.0
	Al	10.0
	Ba	5.0
	Bo	1.0
	Bi-Phenyls	0.1
	Flourides	3.0
	Mn	0.5
	Se	2.00

Table II-5. 1988 Toxic Release Inventory for the Potomac River Basin. Releases to Municipal Wastewater Treatment Plants

Jurisdiction	County	Industry Name	Chemical Released	Lb/Yr.	Wastewater Treatment Plant	Pretreatment Program
Potomac Highlands						
LUKE	ALLEGANY	WESTVACO CORP.	1,1,1-TRICHLOROETHANE	14000	UPPER POTOMAC RIVER COMMISSION	
LUKE	ALLEGANY	WESTVACO CORP.	ACETONE	12000	UPPER POTOMAC RIVER COMMISSION	
LUKE	ALLEGANY	WESTVACO CORP.	CATECHOL	29000	UPPER POTOMAC RIVER COMMISSION	
LUKE	ALLEGANY	WESTVACO CORP.	CHLOROFORM	140000	UPPER POTOMAC RIVER COMMISSION	
LUKE	ALLEGANY	WESTVACO CORP.	METHANOL	2500000	UPPER POTOMAC RIVER COMMISSION	
Upper Great Valley						
CHAMBERSBURG	FRANKLIN	KRAFT DAIRY GROUP	PHOSPHORIC ACID	17224	CHAMBERSBURG BORO	
CHAMBERSBURG	FRANKLIN	KRAFT DAIRY GROUP	SODIUM HYDROXIDE (SOLN)	122249	BOROUGH OF CHAMBERSBURG	
CHAMBERSBURG	FRANKLIN	PET INC.	SODIUM HYDROXIDE (SOLN)	38917	BOROUGH OF CHAMBERSBURG	
HAGERSTOWN	WASHINGTON	MARYLAND RIBBON CO.	SODIUM HYDROXIDE (SOLN)	28210	WATER POLLUTION CONTROL PLANT	Y
Shenandoah						
WEYERS CAVE	AUGUSTA	CERRO METAL PRODUCTS	COPPER	250	AUGUSTA CO SERVICE AUTHORITY	Y
WEYERS CAVE	AUGUSTA	CERRO METAL PRODUCTS	LEAD	250	AUGUSTA CO SERVICE AUTHORITY	Y
WEYERS CAVE	AUGUSTA	CERRO METAL PRODUCTS	ZINC (FUME OR DUST)	250	AUGUSTA CO SERVICE AUTHORITY	Y
STUARTS DRAFT	AUGUSTA	NIBCO STUARTS DRAFT DIV.	COPPER COMPOUNDS	250	AUGUSTA CO SERVICE AUTHORITY	Y
STUARTS DRAFT	AUGUSTA	NIBCO STUARTS DRAFT DIV.	LEAD COMPOUNDS	250	AUGUSTA CO SERVICE AUTHORITY	Y
WAYNESBORO	AUGUSTA	STANLEY FURNITURE	ACETONE	11	AUGUSTA CO SERVICE AUTHORITY	Y
WAYNESBORO	AUGUSTA	STANLEY FURNITURE	METHANOL	10	AUGUSTA CO SERVICE AUTHORITY	Y
WAYNESBORO	AUGUSTA	STANLEY FURNITURE	TOLUENE	5	AUGUSTA CO SERVICE AUTHORITY	Y
WAYNESBORO	AUGUSTA	TELEDYNE LANDIS MACHINE	BARIUM	25	AUGUSTA CO SERVICE AUTHORITY	
STRASBURG	SHENANDOAH	BORDEN INC. DAIRY	SODIUM HYDROXIDE (SOLN)	320000	STRASBURG WASTEWATER	
STRASBURG	SHENANDOAH	BORDEN INC. DAIRY	SULFURIC ACID	180000	STRASBURG WASTEWATER	
BRIDGEWATER	ROCKINGHAM	ETHAN ALLEN INC.	TOLUENE	250	HARRISONBURG-ROCKINGHAM REGIONAL SA	
BRIDGEWATER	ROCKINGHAM	ETHAN ALLEN INC. BRIDGEWATER	METHYL ETHYL KETONE	250	HARRISONBURG-ROCKINGHAM REGIONAL SA	
DAYTON	ROCKINGHAM	ROCCO TURKEYS INC.	CHLORINE	24300	HARRISONBURG-ROCKINGHAM REGIONAL SA	
HARRISONBURG	ROCKINGHAM	R.R.CONNELLEY SONS CO MFG	1,1,1 TRICHLOROETHANE	1	HARRISONBURG-ROCKINGHAM REGIONAL SA	
HARRISONBURG	ROCKINGHAM	AMP INC BLDG 151	FREON 113	10	HARRISONBURG-ROCKINGHAM REGIONAL SA	Y
HARRISONBURG	ROCKINGHAM	AMP INC BLDG 151	COPPER	20	HARRISONBURG-ROCKINGHAM REGIONAL SA	Y
Piedmont						
FREDERICK	FREDERICK	CHLOROX CO.	SODIUM HYDROXIDE (SOLN)	121	FREDERICK CITY WASTEWATER TREATMENT	Y
WALKERSVILLE	FREDERICK	ROTOREX CO.	1,1,1-TRICHLOROETHANE	250	FREDERICK CO DIV.OF PUBLIC WORKS WAT	Y
WALKERSVILLE	FREDERICK	ROTOREX CO.	FREON 113	250	FREDERICK CO DIV.OF PUBLIC WORKS WAT	Y
GAITHERSBURG	MONTGOMERY	WATKINS JOHNSON CO.	1,1,1-TRICHLOROETHANE	2	WASHINGTON SUBURBAN SANITARY COMM	

Table II-5. 1988 Toxic Release Inventory for the Potomac River Basin. Releases to Municipal Wastewater Treatment Plants

Jurisdiction	County	Industry Name	Chemical Released	Lb/Yr.	Wastewater Treatment Plant	Pretreatment
Urban						
SILVER SPRING	MONTGOMERY	MID ATL COCA-COLA BOTTLING	PHOSPHORIC ACID	250	WASHINGTON SUBURBAN SANITARY COMM.	Y
SILVER SPRING	PRINCE GEORGES	COCA-COLA BOTTLING CO. INC.	SODIUM HYDROXIDE (SOLN)	250	WASHINGTON SUBURBAN SANITARY COMM.	Y
DIST HGHTS-FORESTVI	PRINCE GEORGES	MILLIPORE CORP.	HYDROCHLORIC ACID	16000	WASHINGTON SUBURBAN SANITARY COMM.	
HYATTSVILLE	PRINCE GEORGES	PEPSI COLA BOTTLERS	PHOSPHORIC ACID	750	BLUE PLAINS WWTP-D.C.DEPT PUBLIC WOR	Y
HYATTSVILLE	PRINCE GEORGES	PEPSI COLA BOTTLERS	SODIUM HYDROXIDE (SOLN)	14200	BLUE PLAINS WWTP-D.C.DEPT PUBLIC WOR	Y
LANDOVER	PRINCE GEORGES	SAFEWAY STORES INC MILK PLANT	PHOSPHORIC ACID	12000	WASHINGTON SUBURBAN SANITARY COMM.	Y
LANDOVER	PRINCE GEORGES	SAFEWAY STORES INC MILK PLANT	SODIUM HYDROXIDE (SOLN)	84000	WASHINGTON SUBURBAN SANITARY COMM.	Y
WASHINGTON	DC	CAPITOL PRINTING INK CO. INC.	COPPER COMPOUNDS	250	BLUE PLAINS WWTP-D.C.DEPT PUBLIC WOR	Y
ALEXANDRIA	FAIRFAX	MID-ATL COCA-COLA BOTTLING CO	PHOSPHORIC ACID	1487	ALEXANDRIA SANITATION AUTHORITY	
ALEXANDRIA	FAIRFAX CITY	COCA-COLA BOTTLING CO.	SODIUM HYDROXIDE (SOLN)	250	ALEXANDRIA SANITATION AUTHORITY	
LORTON	FAIRFAX	ALEXANDRIA METAL FINISHERS	SULFURIC ACID	250	LOWER POTOMAC POLLUTION CONTROL PLANT	Y
LORTON	FAIRFAX	ALEXANDRIA METAL FINISHERS	TETRACHLOROETHYLENE	250	LOWER POTOMAC POLLUTION CONTROL PLANT	Y
RESTON	FAIRFAX	AUTOMATA INC.	GLYCOL ETHERS	46000	NA	
Lower Estuary						
WALDORF	CHARLES	EMBASSY DAIRY INC.	CHLORINE	34000	CHARLES CO DEPARTMENT OF PUBLIC WORK	Y

The Westvaco Corporation, a pulp and paper mill in the upper part of the basin, contributes the largest load of toxic organic chemicals to a treatment process. However, because wastewater treated at the Upper Potomac River Commission plant is largely industrial, the plant operates under an industrial point source permit and is therefore not subject to pretreatment regulations. Some dischargers on the TRI may be subject to pretreatment limits in the future. For example, industries discharging to the Chambersburg, Pennsyvania, plant may be required to pretreat their wastestream once the state pretreatment program is in place.

Wastewater Treatment in Publicly Owned Treatment Plants

Pretreated industrial discharges, though controlled, contain non-conventional pollutants which are either partially removed by treatment processes or pass through undiminished.

Treatment type and degree vary among Potomac Basin POTWs receiving pretreated industrial effluent; however, all plants use primary and secondary treatment. Primary treatment, which removes pollutants that settle or float, can reduce heavy metal concentrations 10 to 25%, whereas some immiscible organics are removed by surface-skimming systems or by adsorbing to solids that settle out (USEPA, 1982).

Most Potomac basin plants that receive pretreated industrial discharges treat wastewater by the activated sludge process. A small number of plants have rotating biological contactors, trickling filters, or oxidation ponds. Secondary treatment processes reduce levels of metals, but removal by trickling filters is significantly lower than by the activated sludge process (11-55% versus 62-85%, according to EPA's 1982 study of priority pollutants in POTWs). Removal efficiencies measured at the Waynesboro and Blue Plains treatment plants, presented in Table II-6, support this observation.

Some tertiary treatments further reduce toxic chemical concentrations in wastewater. The Alexandria and Upper Occoquan plants in Virginia remove toxic organics from process wastewater by sending it through activated carbon columns. Concentrations of heavy metals are also reduced significantly if phosphorus is removed by coagulation with lime. The Blue Plains and Lower Potomac Pollution Control Plants remove phosphorus by precipitation with iron salts. Lime is added during nitrification to control pH.

During wastewater purification, materials settle from the waste stream, creating pollutant-enriched sludge. Often, pollutants present at undetectable levels in the influent appear at much higher levels in sludge. In a national study, arsenic was detected in less than 15 percent of all POTW influent samples, but was consistently measured at significant levels in primary sludges (USEPA, 1982). In February, 1989, prompted the Clean Water Act amendments, EPA established sludge use and disposal standards, including management practices and numerical limitations for toxic pollutants that may adversely affect public health or the environment. EPA is now studying the feasibility and cost of improved industrial pretreatment as a means for more municipalities to comply with the new sludge disposal requirements (40 CFR Part 503).

After dewatering, most sludges are composted or digested, a process in which organic solids are degraded and infectious agents destroyed. Chemical analyses of sludge from the Waynesboro and Blue Plains wastewater treatment plants are presented in Table II-7. The apparent increase in metals concentrations after digestion is probably explained by decreasing bulk of the sludge, as composting is not expected to affect the total quantity of metals. Among POTWs in this survey, the predominant sludge disposal method is land application or landfill. Little Hunting Creek, Arlington, and Lower Potomac Pollution Control plants use a combination of incineration and landfill.

Table II-6. Removal Efficiencies: Metals in Publicly Owned Treament Plants

Parameter	Removal Efficiency (%) Waynesboro	Blue Plains
Cadmium	0-67	77-97
Chromium	43-80	
Copper	51-69	83
Lead	14-71	71-95
Mercury	0-99	
Nickel	33	33
Zinc	37-76	55-80

Waynesboro: trickling filter with rotating biological contactors Monthly sampling: February - July, 1990.

Blue Plains: activated sludge, denitrification, phosphorus removal. Two 24 hour composited samples taken in Feb-Mar 1991.

Table II-7 Toxic Parameters Measured in Sludge (All measurements expressed as mg/kg)

Parameter	Blue Plains Treatment Plant Composite: March 1-15, 1991 Raw	Digested	Waynesboro March 29, 1990
Cadmium	2.4	4.2	4.2
Copper	303	377	216
Lead	74	111	725
Mercury	1.0	1.9	3.0
Nickel	28	36	42
Zinc	403	511	1650
PCB's	<1	<1	
% Moisture	81.5	85.8	76.0

III. Effects of Pretreatment in the Potomac River Basin

In principal, industrial pretreatment has two benefits: (1) reduced loading to and interference with municipal wastewater treatment processes, and (2) reduced toxic loadings to receiving waters and sludge material. In the Potomac watershed, wastewater treatment facilities measured few unconventional pollutants in influents prior to monitoring requirements imposed by pretreatment programs. This lack of monitoring data makes evaluating the effectiveness of pretreatment difficult. Reductions in industrial loads are also masked when the industrial wastestream combines with other inflows to the wastewater treatment plant. Loading data from the Frederick-Winchester Service Authority, which receives 5 percent of its flow from industrial dischargers (Table III-1), shows that pollutant loads from (pretreated) industrial sources are often a fraction of loads from uncontrolled, domestic sources. Other factors that obscure pretreatment effectiveness are fluctuating flows, combined storm sewers, and changes in treatment processes and capacity.

In spite of the complexities, case studies illustrate improvements in industrial loadings received by local treatment plants.

City of Waynesboro

The Environmental Protection Agency approved the city of Waynesboro's pretreatment program in 1983. After poor audits of the treatment plant in 1986, EPA issued an administrative order for non-compliance. The city, newly committed to the pretreatment program, performed an industrial waste survey and worked with local industries to establish pretreatment technologies. From 1986 to 1990, industrial facilities installed and upgraded pretreatment equipment. The city rejected one industrial user's waste when it caused pass-through interference. Monitoring data of selected pollutants in the plant influent, presented in Table III-2, show that plant loadings decreased from 1986 to 1989. Higher loadings of some parameters on January 21, 1987, probably resulted from high flows on that day (4 mgd versus 2 mgd average) and solids washout from sewer lines. Until 1988, the plant received runoff from combined sewers. The separation of combined sewers in 1988 and 1989 might have enhanced the reduction in loads.

Table III-1. Pollutant loadings (Pounds/Day)
Frederick-Winchester Service Authority

Pollutant	Uncontrollable Domestic Sources	Controllable (Industrial) Sources
Cadmium	0.34	0.02
Chromium	1.71	0.03
Copper	5.48	0.38
Cyanide	0.17	0.18
Lead	1.51	0.06
Nickel	1.37	0.07
Silver	0.14	0.02
Zinc	5.57	4.31
Phenols	2.83	5.24

Calculated from field sampling data: Frederick-Winchester Service Authority

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Table III-2. City of Waynesboro Influent Loading Data

Pollutant	Plant Influent kg/day			
	4/3/86	1/21/87	8/31/88	2/2/89
Cadmium	0.045	0.155	0.014	0.007
Chromium	0.271	7.294	0.187	0.11
Copper	1.086	0.931	0.458	0.438
Lead	0.199	0.196	0.034	0.029
Silver	0.31	0.103	0.102	0.018
Zinc	1.592	4.50	1.65	1.21
Methylene Chloride		1.13	0.42	<0.015
Bis (2-ethylhexyl) phthlate		0.171	n.d.	n.d.

Not Detected: n.d.

Blue Plains Wastewater Treatment Plant

Though operated by the District of Columbia'a Department of Public Works, the Blue Plains Treatment Plant receives wastewater from a large interstate suburban area. Thus, funding, planning, and regulation are interjurisdictional in nature. Four pretreatment programs regulate industrial wastestreams flowing to Blue Plains: Washington Suburban Sanitary Commission (Maryland), District of Columbia (reporting directly to EPA), and Fairfax and Loudon Counties in Virginia. The Washington Suburban Sanitary Commission Industrial Discharge Control Program for facilities in the metropolitan area of Maryland was established in 1981 and approved by EPA in 1983. The District of Columbia's pretreatment program followed in 1986. In Virginia, Fairfax County's pretreatment plan was approved in 1985.

Although Blue Plains has a large number of industrial users, industrial wastewater comprises less than 10 percent of the plant's total volume (309 mgd). Permitted and non-permitted industrial users contribute 3 mgd from the District of Columbia and 22 mgd from the WSSC in Maryland. Virginia's industrial contribution is extremely small when compared with that of D.C. and Maryland. If the average household use and disposal of chemicals is considered, an estimated 85 percent of industrial pollutants (i.e., metals and organics) treated at Blue Plains originates from domestic sources (T. Butani, personal communication).

Analyzing effects of industrial pretreatment for Blue Plains sewage treatment plant is complex because of the large number of sources, large contributing area, and large capacity of the system. However, some qualitative observations are useful. Neutralization of acidic discharges, which corroded sewer lines, after the WSSC established its pretreatment program has been mentioned. Restaurants discharged fats, oils, and grease to the sewer system before pretreatment regulations required them to install grease interceptors. Electroplaters are required to install a precipitator to remove metals and a neutralization basin to correct pH (MWCOG, 1983). Though not permitted, photoprocessors throughout the metropolitan area have been strongly encouraged to install silver recovery units (T. Butani, personal communication).

The Bureau of Engraving and Printing, one of the District of Columbia's largest industrial dischargers, monitored its wastewaters in the late 1980's, prior to full compliance with pretreatment requirements. The Bureau, classified under Standard Industrial Codes 2753 and 2893, prints currency and postage stamps and manufactures inks on site. The

Bureau has operated under a three year permit to discharge 305,600 gallons of wastewater from eight separate outfalls to Blue Plains per day. At the end of three years (September, 1990), the Bureau is to comply with pretreatment requirements. In the interim period, the facility installed silver recovery for its photoengraving process, recovering more than 99 percent of the silver used (C. Pettaway, personal communication). The facility also removed process wastes containing oil and grease from its cafeteria and wastes from its cyanide metal hardening process and disposed of them as hazardous waste. Printing processes that use less ink, development of new inks, ink reconstitution, and other waste minimization measures have been incorporated.

Table III-3 compares loadings of lead and oil and grease to Blue Plains from three outfalls of the Bureau of Engraving and Printing in 1988 and 1990. Lead loadings have been reduced by one to two orders of magnitude. In contrast, oil and grease levels have shown mixed trends.

In June, 1991, pollutant loadings to Blue Plains will be further reduced when a new pretreatment facility at the Bureau of Engraving and Printing begins operation. The continuous treatment process will treat an average of 160,000 gallons per day, removing metals and oil and grease by calcium chloride precipitation and acid cracking. When these pollutants are removed from the wastestream, they settle into a sludge which will be landfilled in another state (C. Pettaway, personal communication).

The examples just cited are not necessarily representative of all publicly owned treatment plants, nor do they suggest that all industrial loads to sewage treatment plants are in full compliance with pretreatment requirements. However, these results demonstrate that progress in reducing pollutant loadings is being made.

Table III-3. Comparison of Loadings at Three Selected Outfalls for years 1988 and 1990
Bureau of Engraving and Printing

Outfall #14

Month	Lead mg/l	O & G g/l	Flow gal/day
1988			
January	17.8	1150	65211
March	18.2	2680	73980
May	16	2080	75780
1990			
February	0.2	1920	44100
March	0.24	1440	33768
May	0.25	590	113387

LOADINGS

Month	Lead lb/day	O & G lb/day
1988		
January	11.59	749027
March	13.45	1980285
May	12.11	1574333
1990		
February	0.09	845704
March	0.08	485676
May	0.28	668181

Outfall #15/16

Month	Lead mg/l	O & G g/l	Flow gal/day
1988			
January	18	2640	53991
March	13.9	4750	59103
May	21	4110	61902
1990			
February	0.2	580	50780
March	1.5	1890	118170
May	1.04	3750	113387

LOADINGS

Month	Lead lb/day	O & G lb/day
1988		
January	9.71	1423652
March	8.21	2804024
May	12.98	2541119
1990		
February	0.10	294171
March	1.77	2230733
May	1.18	4246910

Outfall #17

Month	Lead mg/l	O & G g/l	Flow gal/day
1988			
January	35	2560	43422
March	25.2	3010	34100
May	33	3410	50012
1990			
February	0.2	1270	76014
March	0.05	1400	88965
May	0.1	3300	86400

LOADINGS

	Lead lb/day	O & G lb/day
1988		
January	15.18	1110269
March	8.58	1025178
May	16.48	1703363
1990		
February	0.15	964219
March	0.04	1244015
May	0.09	2847779

IV. Future Challenges

In a recent nationwide survey of POTW program audits, EPA found 47% of POTWs may still be violating pretreatment requirements. This finding was supported by a Chesapeake Bay Foundation study of sewage treatment plant performance that found numerous violations of NPDES permit requirements, attributed by some POTWs to industrial users. The challenge to the National Pretreatment Program is to ensure that all states and affected POTWs develop pretreatment programs that enforce federal categorical standards, prohibited standards, and local limits.

Another challenge lies in responding to increased discharge of hazardous wastes other than typical industrial wastes covered by the Pretreatment Program into sewage systems. RCRA amendments requiring more stringent hazardous waste disposal controls may result in the discharge of additional quantities of hazardous waste and toxic chemicals to sewage treatment systems in order to avoid costs of waste disposal controls.

Publicy owned treatment plants also face more stringent effluent standards on industrial pollutants, so that receiving waters meet toxic chemical standards recently established by the states. Sludge quality standards may also force treatment plants to place tighter limits on sources of contaminants.

References

Butani, Tony. Pretreatment Coordinator. Blue Plains Wastewater Treatment Plant.

Chesapeake Bay Foundation. 1989. Industrial Pretreatment in the Chesapeake Bay Watershed: The Untapped Potential for Reducing Toxics.

Federal Register. 40 CFR Part 403. General Pretreatment Regulations for Existing and New Sources.

Federal Registre. 40 CFR Part 503. National Sewage Sludge Survey; Availability of Information and Data, and Anticipated Impacts on Proposed Regulations; Proposed Rule.

Metropolitan Washington Council of Governments. 1983. Potomac River Quality.

Pettaway, Clayton. Chief Environmental Officer. Bureau of Engraving and Printing.

USEPA. 1982. Fate of Priority Pollutant in Publicly Owned Treatment Works. EPA 440/1-82/303.

USEPA. 1986. Environmental Regulations and Technology. The National Pretreatment Program. EPA/625/10.86/005

APPENDIX A

Table A-1. Washington Metropolitan Transit Authority Bladensburg Facility
Toxic Parameter Loading for 1990

Permitted flow = 6000 gpd — LOADING Manhole #100

Month	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Silver	O & G
1-2	0.08	0.06	0.41	0.23	0.06	3.86	0.01	356.58
3-4	0.16	0.41	1.31	1.02	0.12	5.79	0.03	271.17
5-6	0.09	0.05	0.55	0.21	0.03	2.07	0.02	127.97
7-8	0.03	0.03	0.25	0.12	0.03	0.11	0.02	67.51
9-10	0.02	0.04	0.27	0.12	0.03	1.13	0.02	24.38
11-12	0.07	0.19	0.06	0.49	0.05	3.05	0.02	155.39
Sum lb/yr	0.45	0.78	2.86	2.20	0.32	16.01	0.10	1003.0

Permited flow = 45000 gpd — LOADING Manhole #8

Month	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Silver	O & G
1-2	0.24	0.44	4.42	1.95	0.44	10.17	0.11	3823.71
3-4	0.80	2.58	31.99	14.63	1.83	47.99	0.11	1805.27
5-6	0.14	0.37	7.08	2.51	0.46	8.46	0.11	571.29
7-8	0.37	0.70	8.13	2.55	6.50	1.42	0.12	1702.48
9-10	0.18	0.41	5.03	1.60	0.46	30.16	0.11	662.70
11-12	0.30	0.57	8.00	3.66	0.46	1.39	0.11	799.81
Sum lb/yr	69.1	167.3	2133.5	887.5	334.8	3286.3	22.6	309053.3
Total (lb/yr)	69.5	168.1	2136.3	889.7	335.1	3302.3	22.7	310056.3

Table A-2. Washington Metropolitan Transit Authority Bladensburg Facility. Parameter Concentrations (mg/l) and Flows

Manhole # 8 1990

Permitted Flow 45000

Month	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Silver	O & G	TTO	Cyanide
1										
2	0.011	0.02	0.2	0.088	0.02	0.46	0.005	173		
3										
4	0.035	0.113	1.4	0.64	0.08	2.1	0.005	79		
5										
6	0.006	0.016	0.31	0.11	0.02	0.37	0.005	25		
7										
8	0.016	0.03	0.35	0.11	0.28	0.061	0.005	73.3		0.11
9										
10	0.008	0.018	0.22	0.07	0.02	1.32	0.005	29		0.07
11										
12	0.013	0.025	0.35	0.16	0.02	0.061	0.005	35	0.034	0.16
Permit	1.13	6.58	4.23	0.56	3.85	3.95	0.94	94	2	1.8

Table A-2. Washington Metropolitan Transit Authority Bladensburg . Parameter Concentrations (mg/l)

Manhole #100

Permitted Flow 6000

Month	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Silver	O & G	
1									
2	0.028	0.02	0.14	0.077	0.02	1.31	0.005	121	
3									
4	0.052	0.136	0.43	0.336	0.04	1.9	0.009	89	
5									
6	0.028	0.015	0.18	0.07	0.01	0.68	0.005	42	
7									
8	0.009	0.01	0.08	0.04	0.01	0.036	0.005	21.8	
9									
10	0.008	0.014	0.09	0.04	0.01	0.37	0.005	8	
11									
12	0.023	0.062	0.021	0.16	0.015	1	0.005	51	0.089
Permit	1.2	7	4.5	0.6	4.1	4.2	1	100	2.13

Table A-3. Bureau of Printing and Engraving. Parameter Concentrations (mg/l) and Flow (gpd)

1990

Outfall #1

Permitted Flow 61000

Month	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc	TTO	O & G	Flow
1										
2	0.02	0.02	0.095	0.1	0.06	0.02	0.415		68.5	1458
3	0.005	0.01	0.1575	0.175	0.029	0.097	0.55		66.5	1026
4										
5	0.003	0.011	0.08	0.1	0.02	0.02	0.398	0.072	41	9954
6										
7	0.003	0.016	0.25	0.13	0.04	0.02	1.14		62	3569
8										
9	0.0035	0.0055	0.125	0.065	0.02	0.02	0.241		160	2569
10										
11	0.005	0.01	0.004	0.015	0.045	0.09	0.348		17	3875
12										
Permit	1.2	7	4.5	0.6	4.1	1	4.2	2.13	100	

Outfall #3

Permitted Flow 58000

Month	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc	TTO	O & G	Flow
1										
2										
3										
4										
5	.003	0.006	0.15	0.05	0.01	0.02	0.078		141	75500
6										
7										
8										
9										
10										
11	0.005	0.01	0.13	0.014	0.04	0.01	0.143	0.077	480	2616
12										
Permit	1.1	6.4	4.11	0.55	3.75	0.91	3.84	1.95	91.38	

Outfall #5

Permitted Flow 15100

Month	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc	TTO	O & G

Table A-4. Bureau of Printing and Engraving. Concentrations (mg/l) and Flow (gpd)

Outfall #9 1990

Permitted Flow 13000

Month	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc	TTO	O & G	Flow
1										
2										
3										
4										
5	0.003	0.004	0.06	0.05	0.01	0.02	0.18		57	10800
6										
7										
8										
9										
10										
11	0.005	0.01	0.4425	0.024	0.04	0.014	0.249		51.96	2117
12										
Permit	1.15	6.73	4.33	0.58	3.94	0.96	4.04	2.05	96.15	

Outfall #10 1990

Permitted Flow 16000

Month	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc	TTO	O & G	Flow
1										
2										
3										
4										
5	0.003	0.004	0.05	0.05	0.01	0.02	0.059		109	12343
6										
7										
8										
9										
10										
11	0.005	0.01	0.315	0.04	0.04	0.01	1.34		62	6509
12										
Permit	0.9	5.25	3.38	0.45	3.08	0.75	3.15	1.6	75	

Table A-5. Bureau of Engraving and Printing. Parameter Concentrations (mg/l) and Flows (gpd)

Outfall #14 1990

Permitted Flow 201000 Combined: 14-17

Month	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc	O & G	Flow
1									
2	0.04	0.04	2.2	0.2	0.06	0.02	0.02	1920	44100
3	0.003	0.005	0.51	0.24	0.012	0.018	0.45	1440	33768
4									
5	0.006	0.008	0.14	0.25	0.02	0.04	0.044	590	113387
6									
7	0.006	0.017	0.43	0.51	0.02	0.04	0.064	2000	52264
8									
9	0.006	0.009	0.35	0.1	0.06	0.04	0.283	2900	40050
10									
11	0.005	0.01	0.321	0.032	0.04	0.01	0.762	555	40148
12									
Permit	0.9	5.25	3.38	0.45	3.08	0.75	3.15	75	

Outfall #15/16 1990

Permitted Flow 201000 Combined: 14-17

Month	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc	O & G	Flow
1									
2	0.04	0.04	2	0.2	0.06	0.02	0.02	580	50780
3	0.003	0.006	0.714	1.5	0.012	0.015	0.341	1890	118170
4									
5	0.006	0.0125	0.605	1.04	0.02	0.04	0.064	3750	113387
6									
7	0.006	0.019	1.2	3	0.02	0.04	0.107	2100	36859
8									
9	0.01	0.01	0.23	1.9	0.03	0.04	0.22	4900	45450
10									
11	0.005	0.01	0.514	1.4	0.04	0.01	0.191	512	
12									
Permit	1.2	7	4.5	0.6	4.1	1	4.2	100	

Table A-6. Bureau of Engraving and Printing. Parameter Concentrations (mg/l) and Flows (gpd)

Outfall #17 1990

Permitted Flow 201000 Combined: 14-17

Month	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc	TTO	O & G	Flow
1										
2	0.04	0.04	0.5	0.2	0.06	0.02	0.08		1270	76014
3	0.003	0.005	0.25	0.05	0.15	0.014	0.34		1400	88965
4										
5	0.006	0.014	0.19	0.1	0.02	0.04	0.091		3300	86400
6										
7	0.024	0.021	1.3	0.1	0.03	0.02	161		2900	
8										
9	0.024	0.21	1.3	0.1	0.03	0.02	1.46		1000	
10										
11	0.006	0.016	0.2	0.1	0.03	0.04	0.075		563	
12										
Permit	1.2	7	4.5	0.6	4.1	1	4.2	1.6	100	

Table A-7. Solid Waste Reduction Center. Parameter Concentrations (mg/l)
1990

Month	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc	Mercury
1								
2			0.152	0.103			4.263	
3			0.353	0.105			21.433	
4			0.540	0.070			7.919	
5								
6								
7								
8								
9	0.041	n.d.	0.069	0.357	0.058	n.d.	0.691	0.001
10	0.066	n.d.	0.158	0.378	0.057	n.d.	1.006	0.001
11	0.070	0.064	0.097	0.515	n.d.	n.d.	2.002	0.001
12	0.082	n.d.	0.084	0.823	0.043	n.d.	3.383	0.000
Permit	1.200	7.000	4.500	0.600	4.100	1.000	4.200	

COMMONWEALTH of VIRGINIA

STATE WATER CONTROL BOARD
Northern Regional Office
1519 Davis Ford Road, Suite 14
Woodbridge, Virginia 22192
(703) 490-8922

Richard N. Burton
Executive Director

Post Office Box 11143
Richmond, Virginia 23230-1143
(804) 367-0056
TDD (804) 367-9763

June 4, 1991

Ms. Elaine Friebele
Environmental Scientist
Interstate Commission on the Potomac River Basin
6110 Executive Boulevard, Suite 300
Rockville, Maryland 20852-3903

RE: Pretreatment Programs in the Potomac River Basin
Local Limits

Dear Ms. Friebele:

Enclosed per your request are copies of the current local limits utilized by the Alexandria Sanitation Authority, Arlington County Pollution Control Plant, Lower Potomac Pollution Control Plant (Fairfax County), and the Upper Occoquan Sewage Authority. Although these jurisdictions have local limits in their ordinances, none of them have modified their respective pretreatment programs to officially incorporate technically-based local limits.

Each of these programs is consequently in the process of developing technically-based local limits for incorporation into their respective programs. Alexandria has already proposed such revisions to their local limits, and I have included a copy of them for your information.

If you have any questions, please feel free to call me at telephone number: (703) 490-8922.

Sincerely,

Jan Marie Pickrel
Senior Environmental Engineer

Enclosure

(7) any water or waste containing fats, wax, grease or oils of saponifiable nature in the excess of 100 mg/l or containing substances which may solidify or become viscous at temperatures between 32 degrees F. and 150 degrees F.;

(8) any radioactive substance of such half-life or concentration as may exceed safe limits as established by state or federal regulations;

(9) any odor- or color-producing substances exceeding concentrations which may be established by the authority for the purpose of meeting NPDES permit conditions;

(10) quantities of flow or concentrations, or both, which constitute a slug discharge, as defined in section 5-6-71, and any pollutant, including conventional pollutants, released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW;

(11) any substance from a septic tank, truck or any portable vessel or devise;

(12) used motor oil in any amount; or

(13) any product containing antifreeze; provided, that this subsubsection shall not apply to domestic users.

(b) No user shall discharge into the collection system or the POTW any wastewater containing pollutant levels above the following concentrations:

Pollutant	Maximum for any one day (mg/l)
Arsenic	0.10
Cadmium	1.20
Chromium, total	7.00
Copper	4.50
Cyanide, total	1.90
Lead	0.60
Mercury	0.01
Nickel	4.10
Phenols	1.00
Silver	1.20
Zinc	4.20

(c) No user shall discharge or cause to be discharged into the collection system or the POTW any substances, materials, waters or wastes which the engineer determines to be or to

Alexandria San. Authority — Proposed

authority to be in violation of its NPDES permit or any state permit issued to regulate the treatment of wastewater or the treatment or application of sludge, the authority may suspend wastewater treatment service, including collection and treatment services, to the user. In addition, the city and the authority may revoke any permits issued under the provisions of this article when the city or the authority determines that the user's continued discharge into the collection system or the POTW will be in violation of federal, state or city law, or a regulation, requirement or procedure issued pursuant to any such law. (Ord. No. 3334, 10/15/88, Sec. 2)

Sec. 5-6-77 Conflict.

In case of inconsistency or conflict between a provision in this division and a provision contained elsewhere in this code, as the same may be amended from time to time, the provision of this division shall control. (Ord. No. 3334, 10/15/88, Sec. 2)

Secs. 5-6-78, 5-6-79 reserved.

SUBDIVISION B

Prohibited Discharges

Sec. 5-6-80 Prohibited user discharges.

(a) No user shall discharge or cause to be discharged into the collection system or the POTW any of the following described substances, materials, waters or wastes:

(1) Any gasoline, benzene, naphtha, fuel oil or other flammable or explosive liquid, solid or gas.

(2) Any waters or wastes containing toxic or poisonous solids, liquids or gases in sufficient quantity, either singly or by interaction with other wastes, to injure or interfere with any sewage treatment process, to constitute a hazard to humans or animals, to create a public nuisance or to create any hazard in the receiving waters of the collection system or the POTW, including but not limited to cyanides, chromium, copper, zinc, silver, lead, nickel, arsenic, mercury, cadmium and phenols.

including but not limited to improperly shredded garbage, ashes, cinders, sand, mud, straw, wood or paunch manure.

(5) Any liquid or vapor having a temperature higher than 150 degrees F. (65 degrees C.) or, at the point of intake to the POTW, having a temperature higher than 104 degrees F. (40 degrees C.).

(6) Any water or waste containing fats, wax, grease or oils in excess of 100 mg/l or containing substances which may solidify or become viscous at temperatures between 32 degrees F. and 150 degrees F.

(7) Any radioactive substance of such half-life or concentration as may exceed safe limits as established by state or federal regulations.

(8) Any odor- or color-producing substances exceeding concentrations which may be established by the authority for the purpose of meeting NPDES permit conditions.

(9) Quantities of flow or concentrations, or both, which constitute a slug discharge, as defined in section 5-6-71.

(b) No user shall discharge into the collection system or the POTW any wastewater containing pollutant levels above the following concentrations:

Pollutant	*Maximum for any 1 day (mg/l)*	*Average of daily values for 4 consecutive days not to exceed (mg/l)*
Arsenic	0.10	0.06
Cadmium	1.20	0.70
Chromium, total	7.00	4.00
Copper	4.50	2.70
Cyanide, total	1.90	1.00
Lead	0.60	0.40
Mercury	0.01	0.006
Nickel	4.10	2.60
Phenols	1.00	0.60
Silver	1.20	0.70
Zinc	4.20	2.60

(c) No user shall discharge or cause to be discharged into the collection system or the POTW any substances, materials, waters or wastes which the engineer determines to be or to contain a pollutant which will pass through or cause inter-

Alexandria San. Authority

[redacted] [redacted]

II. EFFLUENT LIMITATIONS

A. Local Limits: This includes all requirements of the Arlington County Wastewater Pretreatment Ordinance (Chapter 26, Article II), and Sewage Regulations.

POLLUTANT	MAXIMUM VALUE (mg/l)
pH	6 - 10 (inclusive)
Iron, Total	15
Chromium, Total	5
Copper, Total	3
Zinc, Total	2
Oil & Grease	100
Phenolic Compounds	10

B. General Prohibitions

The permittee shall not discharge waterwater containing any of the following materials:

1. Any prohibited material included in the Arlington County Ordinance, Chapter 26, Article II, Section 41.

2. Any pollutant, including oxygen demanding pollutants (BOD etc.) at flow rate and/or concentration which will cause the pollutant to pass through to the receiving waters or interfere with the Arlington County Water Pollution Control Plant.