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Assessment of Wastewater Treatment Facilities in Small Communities

Barry Ryan

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Abstract

This report examines the condition of wastewater treatment facilities in communities of 10,000 persons or fewer. Capital spending requirements for these systems in 1988 are estimated at $13.7 billion and are expected to grow by $4.4 billion over the next 20 years. Likewise, the number of persons receiving sewage treatment will grow from 32 million to 57 million by the year 2008. Analysis of the excess flow capacity of small-community systems shows the average system was operating at 80 percent of capacity, while 20 percent of existing systems were operating in excess of current design flows.

Keywords: Wastewater treatment, needs assessment, Clean Water Act, small communities, small towns, sewage treatment

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Contents

Summary

To bring wastewater treatment of communities of 10,000 persons or fewer up to the effluent standards of the Clean Water Act is estimated to cost $13.7 billion. For the United States as a whole, the backlog in capital spending is nearly $63 billion. By the year 2008, an additional $4.4 billion will be needed in small communities alone to keep up with the growing need for sewage treatment services.

While small-community systems make up one-quarter of the spending backlog, they account for three-quarters of all facilities reported in the Environmental Protection Agency's 1988 Wastewater Treatment Needs Assessment Survey. Half of the 18,437 small-community facilities anticipate no system changes over the next 20 years. Most small communities with spending needs, however, require construction of completely new treatment systems to replace existing methods of on-site disposal.

Small sewage treatment systems currently provide services to 32 million Americans. By the year 2008, the population served by these facilities is estimated to grow to 57 million persons, with most of the change occurring in the South and West. Over the same period, the total U.S. population served by a sewage treatment facility is expected to increase by 78 million persons, from the current 174 million.

An analysis of the excess flow capacity of small systems shows the average facility is operating at 80 percent of design capacity. On average, the more gallons per day the system is capable of treating, the closer it is to operating at full treatment capacity. Twenty percent of all small systems are currently operating in excess of their design flow. These problems appear to exist uniformly across the four U.S. census regions.

Assessment of Wastewater Treatment Facilities in Small Communities

Barry Ryan

Introduction

This report examines the condition of wastewater treatment facilities in small communities. For purposes of this analysis, a small community is any incorporated area, urban or rural, that has a population of 10,000 persons or fewer. A survey of Farmers Home Administration field agents was the basis for determining whether a community fit this definition. Information about individual sewage treatment facilities comes from the Environmental Protection Agency's (EPA) 1988 Wastewater Treatment Needs Assessment Survey. All publicly owned treatment facilities are reported in this biennial assessment, and it is the basis on which project funding is prioritized.

Facility Description

Two aspects of facility status are examined in this report. The present nature of a facility indicates whether the system is an on-site (septic tank) system or a consolidated system serving all or part of a community. In the latter case, the facility may be providing collection, treatment, or some other level of service. The second aspect of facility status is the proposed change, if any, that a system will undergo over the next 20 years. For example, a new facility may have to be built or an existing facility may need to be enlarged to accommodate larger flows, a facility may need to be upgraded to a higher level of treatment, or a facility may need to be both enlarged and upgraded.

Two timeframes are considered in the EPA assessment of wastewater treatment facilities: current conditions and what will be required 20 years from now. Backlogs represent the spending necessary to bring existing treatment facilities up to the water quality standards of the Clean Water Act of 1972 and subsequent

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The author is a research associate, Department of Agricultural and Applied Economics, University of Minnesota. This research was funded, in part, under a cooperative research agreement between the Economic Research Service and the University of Minnesota.

amendments (CWA), or the costs of building new facilities to accomplish the same clean water goals. Needs, on the other hand, represent the amount of spending required to satisfy a system's current backlog plus any additional spending necessary to provide adequate treatment services to the population that will be served in 2008.

EPA Assessment Category Descriptions

The seven EPA assessment categories for wastewater treatment and conveyance system components are defined below. State-level backlog and need estimates for each assessment category are included in appendix tables 1-4. All seven assessment categories are included in the reporting of total backlogs and needs. Also note that throughout this report, all totals include the eight U.S. territories. In the main report, the term "core system" refers to categories I, II, IIIa and IVb (treatment plants, new interceptors, and infiltration/inflow repairs). Up until the CWA amendments of 1987, these categories were eligible for direct Federal funding under the EPA wastewater treatment grants program.

I -- Secondary treatment. Costs for facilities to achieve the minimum level of treatment; reduction of discharge of conventional pollutants by 85 percent.

II -- Advanced treatment. Costs of facilities to achieve greater than secondary treatment level, and/or significantly reduce nonconventional pollutants.

IIIa -- Infiltration/inflow correction. Costs to control for nonsewage flows into the system from infiltration or inflows through failed or faulty system components.

IIIb -- Replacement/rehabilitation of sewers. Cost of reinforcing or reconstructing structurally unsound sewers.

IVa -- Collector sewers. Cost of constructing new pipelines and appurtenances to connect individual wastewater sources with interceptor sewers.

IVb -- Interceptor sewers. Cost of constructing new pipelines and pumping stations to connect collector sewers with treatment facility.

V -- Combined sewer overflows (CSO). Cost to correct combined stormwater and domestic waste discharges that may occur during excessive rainstorms.

Treatment and Service Area Populations

A facility's service area population refers to those persons within the design range of a system. Treatment population refers to those currently receiving service or projected to receive

service in the year 2008. State-level population estimates are included in appendix tables 5 and 6. In this report, residential and nonresidential populations are combined in the treatment or service area estimates. Residents are persons maintaining a permanent residence within the service area of the facility, while nonresidents include transient, seasonal, commuter workers, tourist populations, and others served by local systems even though no local residence is maintained. Estimates of future populations used by EPA in making the needs assessment are based on projections prepared by the Bureau of Economic Analysis, U.S. Department of Commerce.

Flow Rates

Two measures of facility flow rates are reported (tables 7 and 8) which give an indication of the current excess capacity of existing small treatment facilities. Total existing flows reflect the average daily flow of all domestic and industrial wastewater currently processed by a treatment facility. Total present design flow capacity is the average daily flow of domestic and industrial waste that a treatment plant is designed to accommodate.

Facility Description, 1988

Three-quarters of the Nation's 24,151 wastewater facilities are in small communities (places with 10,000 persons or fewer). In small and large communities alike, 80 percent of all facilities are reported to be currently operating, and in both cases, most systems provide at least a secondary level of sewage treatment. Small communities are currently more reliant on on-site disposal (individual septic tanks), while large communities have a proportionally higher number of collection facilities (fig. 1 and table 1).[1] These collection facilities may be collecting sewage and treating it at a less than secondary level, or they may be discharging the sewage without any treatment at all. The goal of the proposed facility changes, outlined in table 2, will be to replace on-site disposal in small communities and collection systems in large areas with sewage treatment facilities that meet CWA standards by the year 2008.

Facility Description, 2008 (Anticipated)

Half of all wastewater facilities currently anticipate no change in their status through the year 2008 (fig. 2, table 2, and app. table 4). The proportion of facilities that requires enlarging, upgrading, or both are about equal in small and large communities. Enlarging a facility increases its flow capacity but

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[1]According to EPA, there are currently 117 small and large facilities, serving over 1.3 million persons, which discharge raw sewage into receiving waters.

Figure 1. Current distribution of wastewater facilities, by type

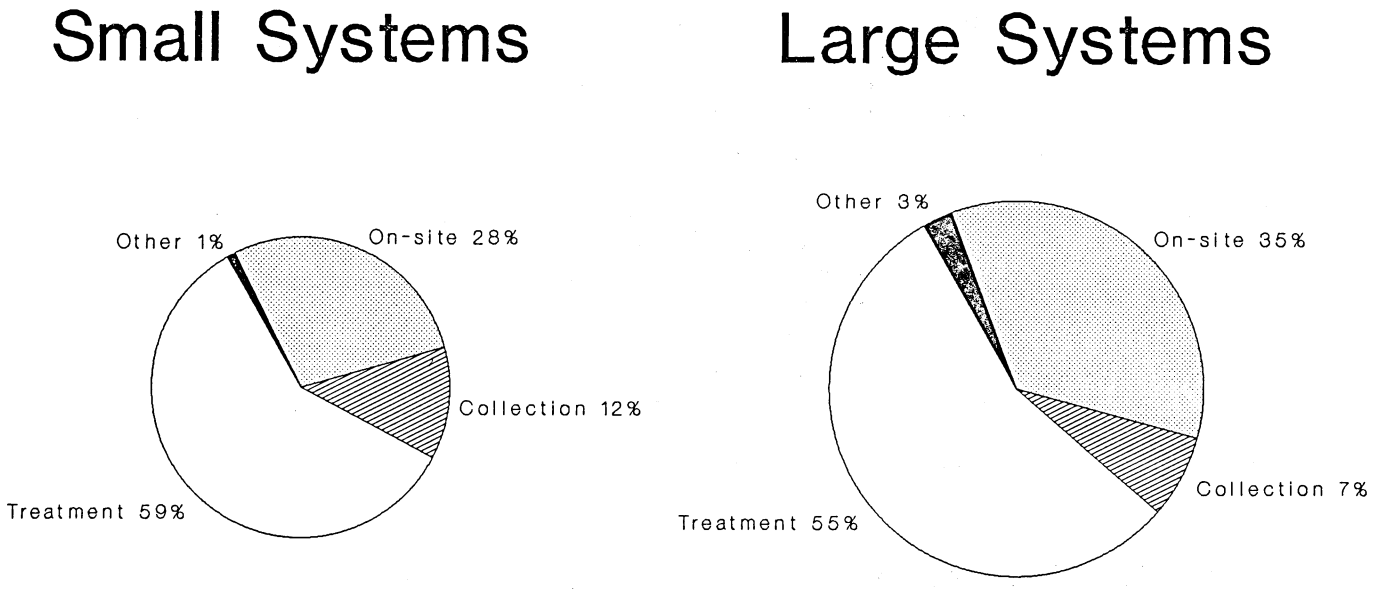

Table 1--Nature of wastewater facilities in 1988

Facility Type	Small	Large	Total 1/
		Number	
Treatment	10,876	3,163	14,039
On-site disposal	5,164	409	5,573
Collection	2,257	1,990	4,247
Other	140	152	292
Total	18,437	5,714	24,151

1/ All totals include the U.S. territories of Puerto Rico, Micronesia, North Marianas, Marshall Islands, Guam, Virgin Islands, Republic of Palau, and American Samoa. Group subtotals are shown in most tables. Individual values are shown in the appendix tables.

does not change the level of treatment, while upgrading accomplishes the reverse. New construction activity (building on a site where no facility currently exists) is left almost exclusively to small communities, while large-community systems have a proportionally greater share of "other" changes. These include replacing, abandoning, or making some capital expenditure to a facility without changing the basic nature or capacity of the system.

Dollar Backlogs, 1988

Twenty-two percent ($13.7 billion) of the Nation's total $62.9 billion wastewater treatment backlog is in small communities (app. table 2). As a percentage of the regional backlogs, small-system backlogs are the highest in the South and North Central regions, where most rural communities exist (fig. 3, table 3, and app. table 1). In total dollars, however, the backlog for small systems in the Northeast exceeds that of the North Central region. Several factors may contribute to the higher backlog in the Northeast, among them: the region's rocky soil, wider settlement patterns, and concentrated industrial base. Treatment plants, interceptors, and infiltration/inflow repairs are considered "core" components and were eligible for direct funding until the 1988 CWA amendments. These categories are generally

Figure 2. Wastewater facility changes over next 20 years

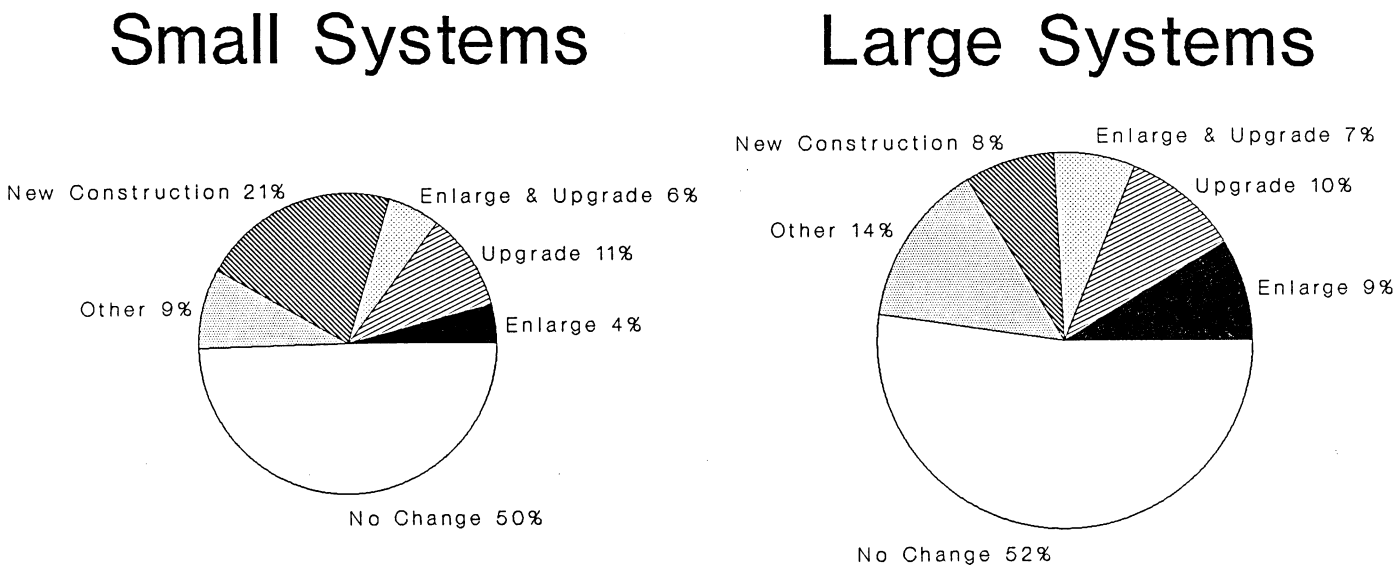

Table 2--Nature of facility changes by year 2008

Facility change	Small	Large	Total
	Number		
No change	9,128	2,988	12,116
New construction	3,933	443	4,376
Upgrade	1,944	573	2,517
Other	1,600	808	2,408
Enlarge and upgrade	1,063	401	1,464
Enlarge	769	501	1,270
Total	18,437	5,714	24,151

more important to small communities, where no treatment system may exist. All small-community projects combined require $8.4 billion in core treatment facilities and $5.3 billion in non-core spending to bring these facilities up to the CWA standards.

Figure 3. Total backlog, by region, small and large systems

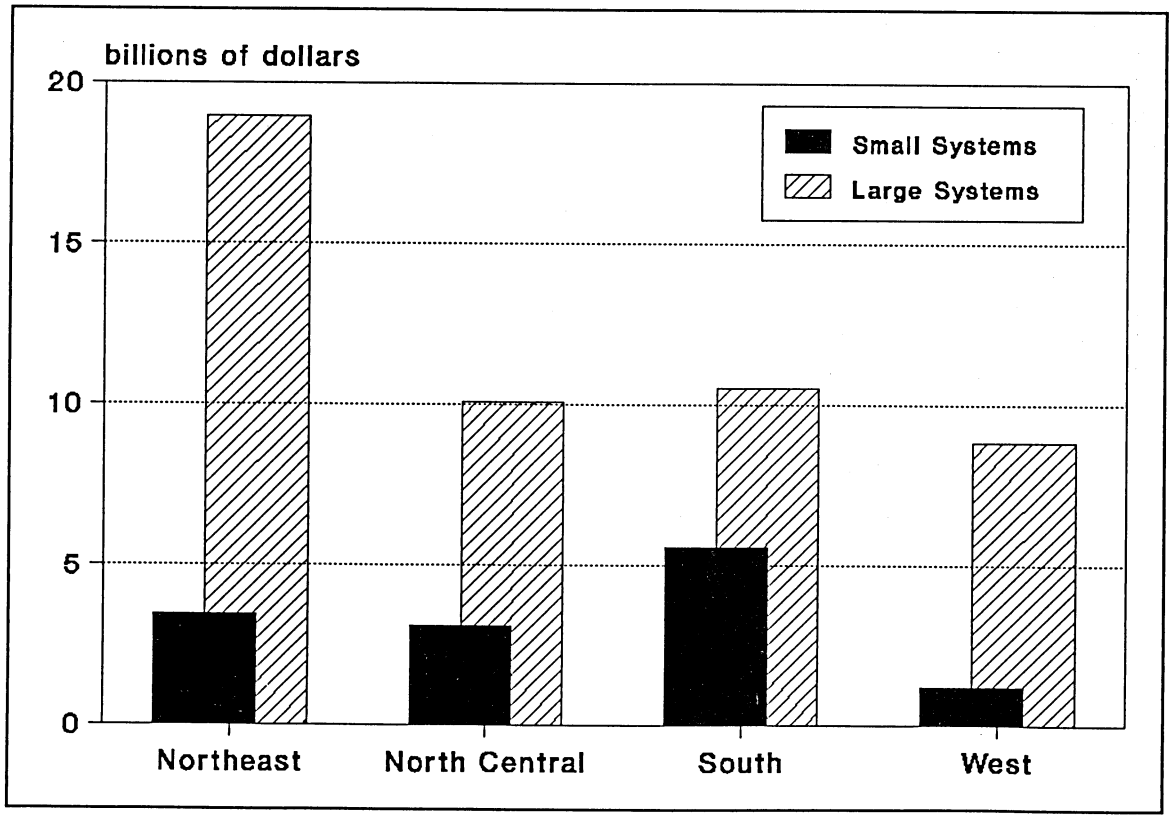

Table 3--Wastewater spending backlog, 1988

Backlog	Total	North-east	North Central	South	West	Terri-tories
			Million 1988 dollars			
Small:						
Core system 1/	8,390	2,011	1,983	3,294	822	280
Total backlog	13,673	3,435	3,094	5,557	1,190	397
Large:						
Core system 1/	26,408	7,683	4,986	7,651	5,495	593
Total backlog	49,249	18,956	10,046	10,509	8,813	923
National:						
Core system 1/	34,798	9,694	6,969	10,945	6,317	873
Total backlog	62,922	22,391	13,140	16,066	10,003	1,321

1/Costs associated with need categories I, II, IIIa, and IVb. (See appendix tables 1 and 2 for State-level detail.)

Dollar Needs, 2008 (Anticipated)

To bring about the system changes outlined in table 2, a total of $77.8 billion in capital spending is needed for the Nation as a whole (app. table 2). Over the next 20 years, total spending needs in small communities will increase 32 percent, from $13.7 billion to $18.1 billion (app. table 3). During this same period, large-community needs will grow 21 percent, from $49.2 billion in 1988 to $59.7 billion in 2008 (fig. 4 and table 4). Small-system needs in the South and West will grow at the fastest rates, 43 percent and 50 percent, respectively. Core treatment spending is the major source of these increases for small and large systems alike.

Note: The national backlog and need estimates in figure 4 and table 4 differ from those reported by EPA in their 1988 Needs Survey Report to Congress. By including costs for facilities not approved by EPA headquarters, the needs survey report writers mistakenly overestimated national backlogs by $5 billion for 1988 and nearly $6 billion in 2008 needs.

Figure 4. Total needs by census region, small and large system

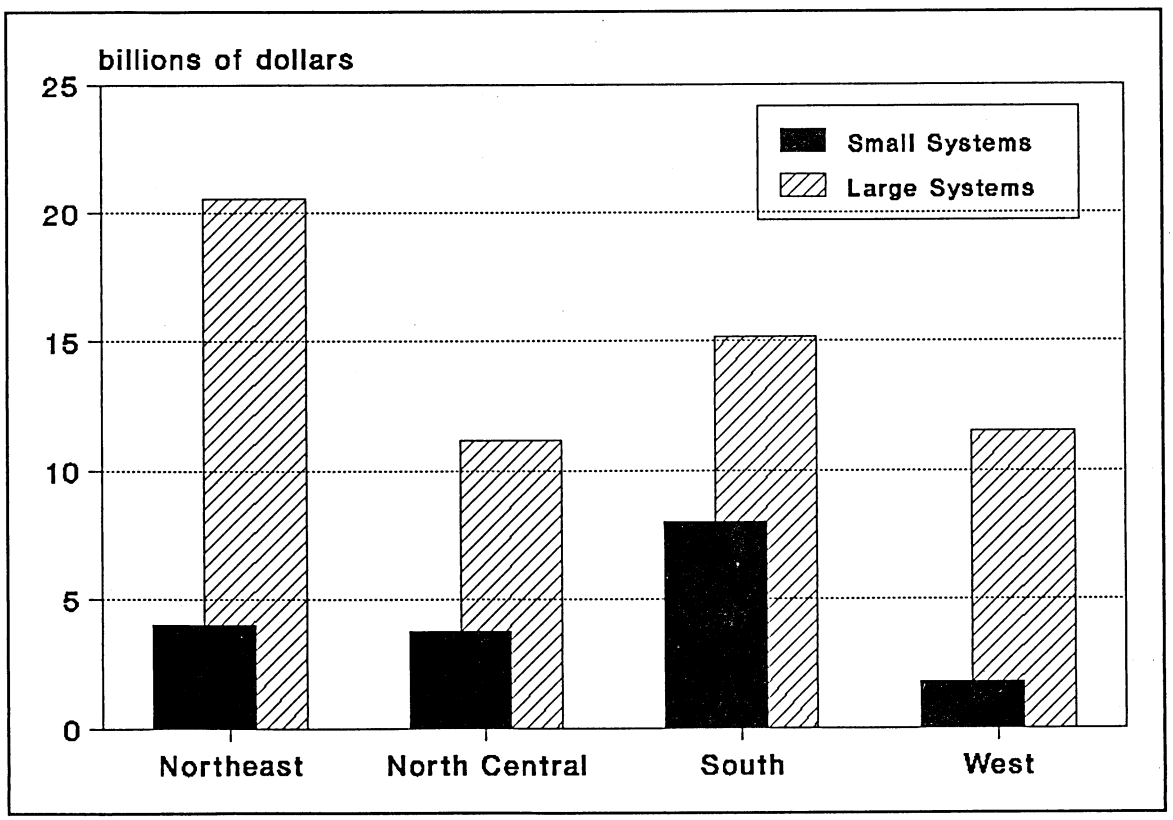

Table 4--Wastewater spending needs for 2008

Needs	Total	North-east	North Central	South	West	Terri-tories
			Million 1988 dollars			
Small:						
Core system 1/	11,699	2,320	2,501	5,207	1,314	356
Total backlog	18,058	4,007	3,757	7,983	1,787	524
Large:						
Core system 1/	35,286	8,370	6,023	11,904	8,049	941
Total backlog	59,746	20,540	11,193	15,153	11,526	1,335
National:						
Core system 1/	46,985	10,690	8,524	17,111	9,363	1,297
Total backlog	77,804	24,547	14,950	23,136	13,313	1,859

1/Costs associated with needs categories I, II, IIIa, IVb. (See appendix tables 3 and 4 for State-level detail.)

Populations Served, 1988

Sewage treatment services were provided to more than 174 million Americans in 1988. Eighteen percent (32 million) of these were users of small systems. Not everyone within the service area of a wastewater treatment facility is served by the facility. Among small facilities, only 67 percent of the total service area population was treated versus 86 percent in large communities (fig. 5, table 5, and app. table 5). The highest rate among small-community systems is in the North Central region where three-quarters of the potential users were served; the lowest rate is in the Northeast where the figure is just over half. The South currently accounts for 36 percent of the population served by small systems, and 32 percent of the total U.S. population served by a treatment facility.

Populations Served, 2008 (Anticipated)

By the year 2008, the total U.S. population within the service area of a sewage treatment facility is projected to increase by 23 percent to 264 million persons, while the population actually receiving treatment will have increased by 45 percent to 253 million (table 6 and app. table 6). For small-community facilities, the total population growth will top 29 percent, with a projected 77-percent increase in treatment services (app. table 5). The South alone will add 11 million new users to small-community systems. These estimates translate into dramatic increases in service rates for small communities and the Nation as a whole by the year 2008. Over the next 20 years, the percentage of all Americans who live within the service area of a sewage treatment plant and receive wastewater treatment will climb from 82 percent of potential to 96 percent. In small communities, the service rate will grow from 67 percent of all potential users to 92 percent. These increases, of course, assume that the spending needs outlined in table 4, in fact, take place.

Table 5--Facility populations, 1988

Population	Total	North-east	North Central	South	West	Terri-tories
			1,000 persons			
Small:						
Treatment 1/	32,074	6,208	8,593	11,404	5,624	245
Service area	48,014	11,183	11,280	17,228	7,577	746
Large:						
Treatment 1/	142,793	30,341	33,253	42,059	35,570	1,571
Service area	166,751	37,664	36,640	50,987	38,822	2,641
National:						
Treatment 1/	174,867	36,549	41,846	53,463	41,194	1,816
Service area	214,765	48,847	47,920	68,215	46,399	3,387

1/Includes current residential and nonresidential populations. (See appendix tables 5 and 6 for State-level detail.)

Figure 5. Population served, small and large systems, 1988

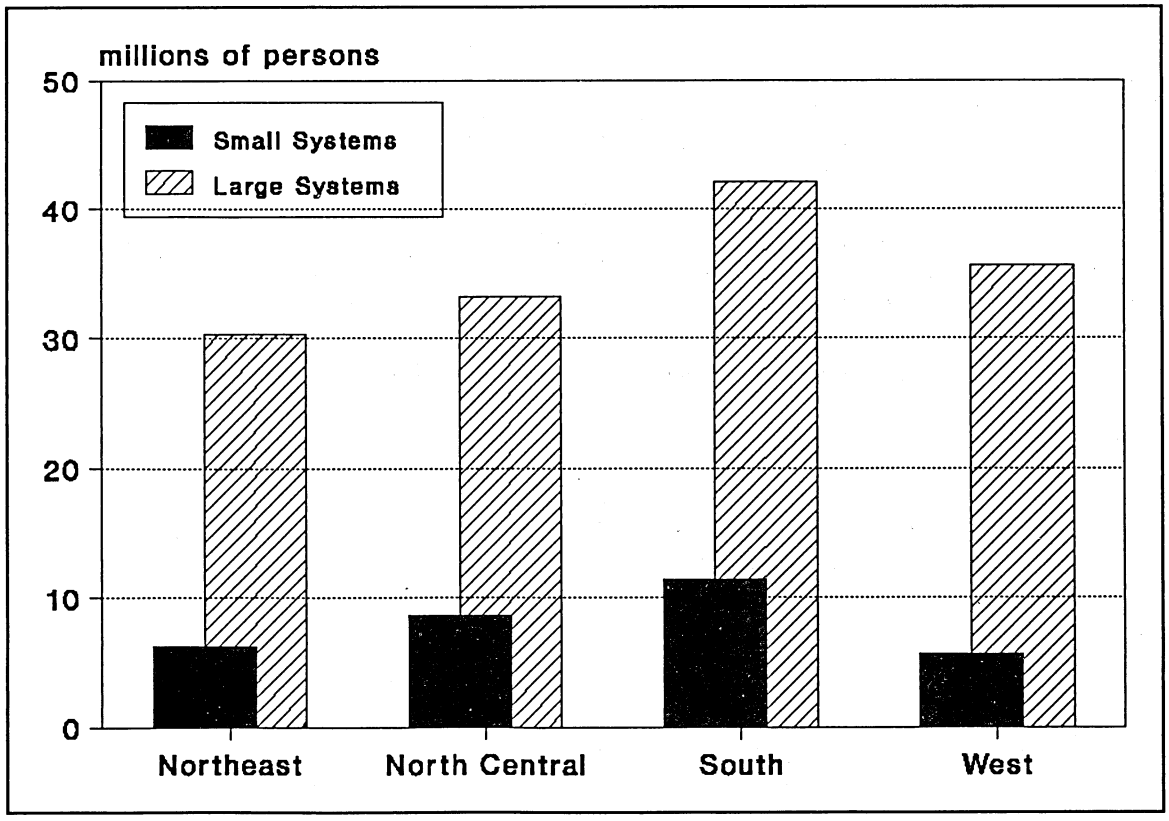

Figure 6. Population served, small and large systems, 2008

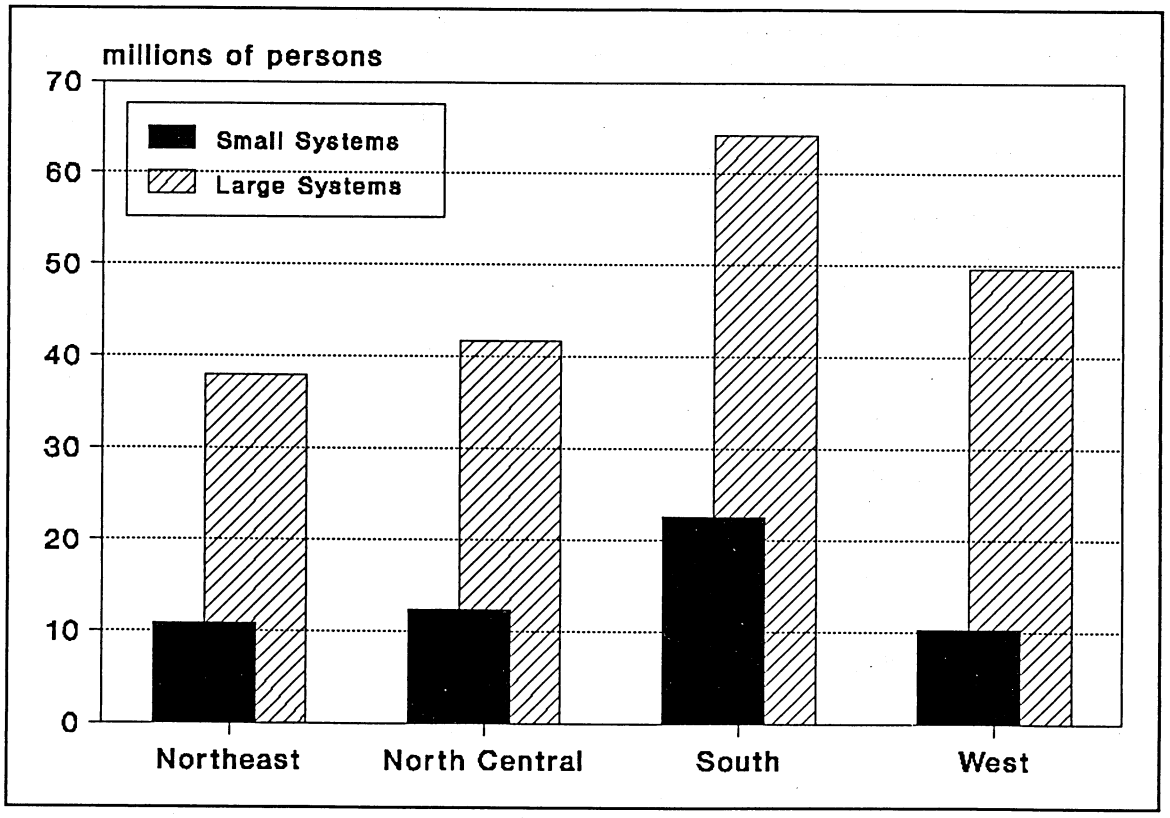

Table 6--Facility populations, 2008

Population	Total	North-east	North Central	South	West	Terri-tories
			1,000 persons			
Small:						
Treatment 1/	56,869	10,874	12,376	22,496	10,322	801
Service area	61,910	13,598	13,045	23,731	10,477	1,059
Large:						
Treatment 1/	196,572	37,911	41,664	64,230	49,545	3,221
Service area	202,378	40,399	41,934	66,212	50,027	3,806
National:						
Treatment 1/	253,441	48,785	54,040	86,726	59,867	4,022
Service area	264,288	53,997	54,979	89,943	60,504	4,865

1/Includes projected residential and nonresidential populations. (See appendix tables 5 and 6 for State-level detail.)

Flow Rate and Facility Capacity

One measure of the adequacy of existing wastewater treatment facilities is the rate of existing flows to the current design capacity of the system (table 7). For all 10,253 small systems that reported existing and design flows, the average is operating at 80 percent of current capacity.

Almost without exception, as the total size of a facility increases, the percentage of excess capacity decreases. This result might be expected since the smallest facilities are likely to be the most recently built, and therefore still have greater excess capacity. In terms of gallons per day (GPD) treated, however, the smallest facilities appear to have the least room for community expansion and economic development. For example, a system that is currently processing 25,000 GPD and operating at 75 percent of its design capacity can treat only an additional 8,000 GPD before it is at 100 percent of capacity. Whereas, a facility currently at 500,000 GPD and 75 percent of design capacity can increase its flow by 134,000 GPD. Regionally, the least opportunity to expand current flows, without building new facilities, exists in the North Central region, particularly among very small facilities.

Building an affordable sewage treatment system and operating it efficiently requires a proper sizing of the facility's flow-through. Systems designed to provide more capacity than is necessary cost more to build, while facilities designed with too little capacity may not provide the level of treatment necessary to ensure community health. Both are more expensive to operate than a properly sized facility.

Twenty percent of all small facilities that reported existing and design flows are operating in excess of their design capacity. This average is slightly below the number of facilities reported to be out of compliance with discharge standards as set under the Clean Water Act. This study makes no attempt to measure the environmental effects of excessive flows, but if effluent standards represent safe levels of contamination, then facilities discharging in excess of their design rate appear to risk community health. The problem of excessive flows exists uniformly across the regions but is perhaps worst in the South (table 8).

Just as some facilities are operating beyond their design flow, others are operating at well below their capacity. Twenty-two percent of all small facilities are operating at less than half of their design flow. This may be the result of prudent planning in fast-growing communities, or it may stem from population decline. In the West, nearly a third of the small facilities are operating at this low flow level.

Table 7--Existing flow as a percentage of design capacity, by facility size

Facility size	Total	North-east	North Central	South	West	Terri-tories
<25,000 GPD:						
Number of facilities	1,441	69	828	312	231	1
Percent of design capacity	69	61	75	62	62	10
25,000 to 50,000 GPD:						
Number of facilities	1,513	63	842	379	227	2
Percent of design capacity	73	69	76	70	71	28
50,000 to 100,000 GPD:						
Number of facilities	1,745	106	882	510	243	4
Percent of design capacity	76	71	81	71	74	34
100,000 to 200,000 GPD:						
Number of facilities	1,883	153	834	644	251	1
Percent of design capacity	80	75	84	78	72	16
200,000 to 500,000 GPD:						
Number of facilities	1,995	257	711	720	301	6
Percent of design capacity	89	76	92	92	87	171
>500,000 GPD:						
Number of facilities	1,676	343	500	569	255	9
Percent of design capacity	90	84	91	93	86	115
Small systems:						
Number of facilities	10,253	991	4,597	3,134	1,508	23
Percent of design capacity	80	76	82	80	76	99

Table 8--Number of small facilities, by existing flow as a percentage of design capacity

Percent	Total	North-east	North Central	South	West	Territories
			Number of small facilities			
<50	2,275	225	829	773	440	8
50 to 75	3,034	314	1,435	842	441	2
75 to 100	2,874	278	1,435	799	357	5
100 to 125	1,189	103	505	411	168	2
125 to 150	380	29	174	141	35	1
>150	501	42	219	168	67	5
Total	10,253	991	4,597	3,134	1,508	23

Appendix table 1--Small-facility wastewater treatment backlogs, by EPA need category, 1988

REGION	STATE	TOTAL	Need category						
			I	II	IIIa	IIIb	IVa	IVb	V
			Thousands of 1988 dollars						
NE	PENNSYLVANIA	987,210	341,516	75,569	6,274	4,469	385,716	109,776	63,890
	NEW YORK	682,298	183,918	28,677	40,385	7,741	251,737	126,433	43,407
	NEW JERSEY	517,159	223,213	40,573	39,278	8,980	133,938	64,513	6,664
	MASSACHUSETTS	391,185	129,369	4,047	13,948	1,106	164,013	78,702	0
	CONNECTICUT	274,833	60,535	7,704	3,456	781	112,732	88,762	863
	NEW HAMPSHIRE	219,188	50,404	1,126	2,986	1,766	94,874	68,032	0
	MAINE	207,619	82,699	538	20,684	5,913	40,639	37,383	19,763
	VERMONT	110,348	38,365	7,534	1,308	1,614	15,372	13,132	33,023
	RHODE ISLAND	45,585	0	0	10	0	25,806	19,769	0
NE Subtotal		3,435,425	1,110,019	165,768	128,329	32,370	1,224,827	606,502	167,610
NC	OHIO	975,503	293,976	118,905	25,720	13,376	298,370	121,623	103,533
	MICHIGAN	514,587	136,332	2,326	23,773	4,771	184,201	78,131	85,053
	ILLINOIS	342,071	148,929	23,917	17,817	9,222	72,660	52,519	17,007
	INDIANA	329,999	115,473	40,874	21,388	8,501	85,797	36,179	21,787
	WISCONSIN	261,314	89,482	5,553	2,528	2,486	114,468	46,797	0
	MINNESOTA	255,613	162,219	26,187	10,998	372	21,505	32,326	2,006
	IOWA	196,539	101,604	12,774	27,363	1,693	16,684	31,170	5,251
	MISSOURI	77,207	29,130	0	2,051	133	20,687	25,206	0
	KANSAS	64,574	28,090	198	7,663	8,210	7,958	10,978	1,477
	SOUTH DAKOTA	52,046	43,479	166	506	173	620	4,934	2,168
	NEBRASKA	14,763	10,718	1,903	617	55	306	1,164	0
	NORTH DAKOTA	9,813	8,937	0	0	468	0	408	0
NC Subtotal		3,094,029	1,168,369	232,803	140,424	49,460	823,256	441,435	238,282
SO.	FLORIDA	1,108,524	224,374	61,878	18,062	2,397	680,465	121,348	0
	WEST VIRGINIA	829,220	273,445	20,447	19,426	12,748	323,861	166,959	12,334
	TEXAS	644,327	275,622	48,184	19,474	827	136,990	163,230	0
	NORTH CAROLINA	462,331	95,844	29,728	24,453	20,661	180,496	111,149	0
	VIRGINIA	435,172	137,756	16,778	15,217	2,799	106,568	77,346	78,708
	LOUISIANA	374,728	125,470	2,667	6,267	2,834	167,244	70,246	0
	KENTUCKY	311,672	58,192	14,955	35,864	6,833	113,238	75,495	7,095
	TENNESSEE	311,505	112,212	29,259	35,761	10,286	93,374	30,613	0
	ALABAMA	263,596	66,275	19,923	19,267	2,356	102,473	53,302	0
	GEORGIA	179,829	62,928	14,344	14,616	13,607	21,710	52,624	0
	MISSISSIPPI	157,328	53,912	11,420	32,355	1,504	25,700	32,437	0
	ARKANSAS	137,017	71,866	14,158	6,960	3,296	26,503	14,234	0
	SOUTH CAROLINA	136,236	43,096	1,196	8,502	0	37,070	46,372	0
	MARYLAND	91,480	30,617	10,083	3,984	164	31,173	12,343	3,116
	OKLAHOMA	59,458	19,186	9,151	5,883	892	9,951	14,395	0
	DELAWARE	54,254	18,894	1,742	0	288	22,045	10,425	860
	Dist. Of Columbia	0	0	0	0	0	0	0	0
So Subtotal		5,556,677	1,669,689	305,913	266,091	81,492	2,078,861	1,052,518	102,113
W.	CALIFORNIA	387,280	166,609	1,988	8,413	8,188	139,306	62,776	0
	ARIZONA	173,520	102,167	20,294	2,039	736	26,279	22,005	0
	HAWAII	131,574	47,370	3,351	0	0	60,302	20,551	0
	OREGON	111,512	56,433	3,576	13,957	3,037	24,233	10,276	0
	WASHINGTON	111,391	48,448	1,321	12,407	103	34,470	13,326	1,316
	UTAH	52,931	17,733	554	5,313	795	19,539	8,997	0
	ALASKA	43,358	16,611	0	0	0	18,831	7,916	0
	IDAHO	39,953	15,917	2,274	2,038	2,342	8,865	8,517	0
	COLORADO	37,459	22,460	3,529	1,463	644	2,634	6,729	0
	NEW MEXICO	34,306	26,833	117	1,029	99	2,742	3,486	0
	NEVADA	30,631	20,958	1,150	977	1,599	2,268	3,679	0
	MONTANA	25,006	15,508	152	253	3,557	3,798	1,493	245
	WYOMING	10,792	7,450	0	1,020	468	1,223	631	0
W. Subtotal		1,189,713	564,497	38,306	48,909	21,568	344,490	170,382	1,561
Terr.	Puerto Rico	224,088	48,806	783	8,149	165	84,956	81,229	0
	Micronesia	66,957	53,155	0	0	114	9,902	3,786	0
	Northern Marianas	24,627	10,519	0	0	198	3,390	10,520	0
	Marshall Islands	23,675	17,589	0	0	0	2,110	3,976	0
	Guam	20,563	15,657	0	73	0	3,265	1,568	0
	Virgin Islands	16,761	5,624	0	179	0	8,145	2,813	0
	Republic of Palau	10,493	9,807	0	0	0	0	686	0
	American Samoa	10,162	3,368	0	0	0	4,825	1,969	0
Terr. Subtotal		397,326	164,525	783	8,401	477	116,593	106,547	0
	TOTAL BACKLOG	13,673,170	4,677,099	743,573	592,154	185,367	4,588,027	2,377,384	509,566

Appendix table 2--Wastewater treatment facility backlogs, by EPA need category, 1988

REGION	STATE	TOTAL	Need category						
			I	II	IIIa	IIIb	IVa	IVb	V
			Thousands of 1988 dollars						
NE	NEW YORK	10,126,819	1,707,386	144,546	146,907	1,480,217	749,769	904,530	4,993,464
	MASSACHUSETTS	5,402,316	2,461,306	14,623	39,161	18,443	545,736	608,607	1,714,440
	NEW JERSEY	2,978,034	1,205,984	164,804	221,667	316,705	273,675	145,957	649,242
	PENNSYLVANIA	1,315,307	523,775	93,088	15,032	7,998	447,161	117,338	110,915
	CONNECTICUT	1,267,133	269,561	101,875	25,055	16,173	287,491	175,257	391,721
	NEW HAMPSHIRE	680,769	100,722	3,443	7,468	4,151	202,485	131,061	231,439
	MAINE	260,027	115,552	538	24,656	10,739	47,278	41,501	19,763
	VERMONT	202,696	62,946	27,739	1,308	4,186	16,195	16,116	74,206
	RHODE ISLAND	158,214	16,153	3,944	10	0	75,738	54,492	7,877
NE Subtotal		22,391,315	6,463,385	554,600	481,264	1,858,612	2,645,528	2,194,859	8,193,067
NC	MICHIGAN	2,809,016	707,924	7,227	64,709	21,043	330,130	593,390	1,084,593
	ILLINOIS	2,721,597	346,466	256,729	77,231	38,752	83,503	234,628	1,684,288
	OHIO	2,558,524	518,293	303,005	269,116	60,828	522,690	497,096	387,496
	WISCONSIN	1,204,388	512,816	141,089	55,664	2,486	131,463	138,986	221,884
	INDIANA	1,133,689	165,055	80,225	39,490	10,010	151,454	97,365	590,090
	MISSOURI	900,885	394,373	0	7,891	70,039	43,149	242,436	142,997
	MINNESOTA	871,698	302,397	48,764	18,376	166,276	21,505	95,825	218,555
	KANSAS	467,245	117,693	2,096	72,968	53,514	42,502	163,773	14,699
	IOWA	287,189	147,313	19,772	39,238	1,693	20,785	53,137	5,251
	NEBRASKA	95,918	47,459	1,903	617	8,041	7,754	9,914	20,230
	SOUTH DAKOTA	68,478	45,725	3,060	2,430	1,713	2,840	10,542	2,168
	NORTH DAKOTA	21,866	11,542	0	0	7,390	0	2,934	0
NC Subtotal		13,140,493	3,317,056	863,870	647,730	441,785	1,357,775	2,140,026	4,372,251
So.	FLORIDA	3,984,462	906,785	251,847	42,389	24,025	2,150,336	606,837	2,243
	TEXAS	3,087,146	1,166,404	377,380	243,292	78,013	245,466	976,591	0
	KENTUCKY	989,429	126,041	48,716	70,007	10,738	490,473	220,716	22,738
	NORTH CAROLINA	965,005	223,381	104,556	68,896	42,425	260,593	264,386	768
	TENNESSEE	862,962	332,058	65,541	149,252	13,930	203,431	89,511	9,239
	MARYLAND	857,245	167,027	394,887	39,714	164	44,163	202,266	9,024
	WEST VIRGINIA	852,261	276,098	20,854	22,517	17,078	333,919	168,385	13,410
	LOUISIANA	824,836	304,587	21,903	57,177	33,330	237,645	170,194	0
	VIRGINIA	755,598	225,883	45,113	29,813	10,001	120,496	118,065	206,227
	GEORGIA	615,428	168,842	89,056	44,325	26,313	56,419	150,605	79,868
	ALABAMA	547,924	168,421	66,319	92,726	18,366	116,424	85,668	0
	SOUTH CAROLINA	450,140	174,006	22,120	20,224	0	83,328	150,462	0
	MISSISSIPPI	386,676	146,522	48,633	62,605	1,504	56,160	71,252	0
	Dist. Of Columbia	273,619	94,878	178,741	0	0	0	0	0
	OKLAHOMA	273,030	71,241	70,392	11,158	11,851	28,830	79,558	0
	ARKANSAS	257,588	117,953	20,136	56,019	3,452	30,929	29,099	0
	DELAWARE	82,314	39,032	2,144	0	288	26,339	13,651	860
So Subtotal		16,065,663	4,709,159	1,828,338	1,010,114	291,478	4,484,951	3,397,246	344,377
W.	CALIFORNIA	5,257,753	2,472,426	25,638	358,289	652,498	340,837	367,330	1,040,735
	WASHINGTON	2,143,763	865,404	18,064	129,764	79,445	206,582	287,343	557,161
	OREGON	951,382	206,277	121,906	39,786	146,986	278,137	56,368	101,922
	ARIZONA	542,500	297,250	81,309	2,039	2,490	46,734	112,678	0
	UTAH	290,543	172,618	32,183	38,876	3,527	23,580	19,759	0
	HAWAII	235,861	96,550	3,351	0	0	92,118	43,842	0
	COLORADO	162,771	56,145	66,014	2,106	6,682	3,768	28,056	0
	ALASKA	107,237	46,287	0	4,632	0	18,831	37,487	0
	NEW MEXICO	106,491	67,107	117	1,029	15,418	7,092	15,728	0
	NEVADA	72,628	28,126	21,860	977	2,850	11,614	7,201	0
	IDAHO	64,933	28,103	2,828	5,050	2,872	14,924	10,037	1,119
	MONTANA	50,795	15,508	1,657	253	9,137	15,182	8,679	379
	WYOMING	16,782	7,839	0	1,061	2,155	1,223	4,504	0
W. Subtotal		10,003,439	4,359,640	374,927	583,862	924,060	1,060,622	999,012	1,701,316
Terr.	Puerto Rico	1,146,256	339,589	4,837	37,238	14,632	380,265	348,432	21,263
	Micronesia	66,957	53,155	0	0	114	9,902	3,786	0
	Northern Marianas	24,627	10,519	0	0	198	3,390	10,520	0
	Marshall Islands	23,675	17,589	0	0	0	2,110	3,976	0
	Guam	20,563	15,657	0	73	0	3,265	1,568	0
	Virgin Islands	18,047	6,409	0	179	0	8,145	3,314	0
	Republic of Palau	10,493	9,807	0	0	0	0	686	0
	American Samoa	10,162	3,368	0	0	0	4,825	1,969	0
Terr. Subtotal		1,320,780	456,093	4,837	37,490	14,944	411,902	374,251	21,263
	TOTAL BACKLOG	62,921,690	19,305,333	3,626,572	2,760,460	3,530,879	9,960,778	9,105,394	14,632,274

Appendix table 3--Small-facility wastewater treatment needs, by EPA need category, 2008

REGION	STATE	TOTAL	Need category						
			I	II	IIIa	IIIb	IVa	IVb	V
			Thousands of 1988 dollars						
NE	PENNSYLVANIA	1,137,271	388,540	90,128	6,274	4,469	459,844	124,126	63,890
	NEW YORK	777,508	195,035	32,379	40,385	7,741	293,633	164,928	43,407
	NEW JERSEY	650,270	271,467	51,648	39,278	8,980	186,009	86,224	6,664
	MASSACHUSETTS	475,872	148,364	4,390	13,948	1,106	209,111	98,953	0
	CONNECTICUT	302,520	68,223	9,626	3,456	781	123,034	96,537	863
	NEW HAMPSHIRE	251,874	57,977	1,550	2,986	1,766	108,517	79,078	0
	MAINE	249,194	100,984	584	20,684	5,913	61,981	39,285	19,763
	VERMONT	116,709	40,076	8,708	1,308	1,614	18,678	13,302	33,023
	RHODE ISLAND	45,646	0	0	10	0	25,867	19,769	0
NE Subtotal	----------	4,006,864	1,270,666	199,013	128,329	32,370	1,486,674	722,202	167,610
NC	OHIO	1,173,735	386,820	143,514	25,720	13,376	347,597	153,175	103,533
	MICHIGAN	596,543	163,106	3,155	23,773	4,771	217,034	99,651	85,053
	ILLINOIS	423,537	197,280	31,991	17,817	9,222	84,697	65,523	17,007
	INDIANA	390,366	149,973	48,313	21,388	8,501	97,707	42,697	21,787
	WISCONSIN	331,420	116,169	7,005	2,528	2,486	144,649	58,583	0
	MINNESOTA	319,164	204,634	33,486	10,998	372	23,146	44,522	2,006
	IOWA	263,680	118,187	14,276	27,363	1,693	17,349	79,561	5,251
	MISSOURI	98,860	35,921	0	2,051	133	25,830	34,925	0
	KANSAS	77,194	35,806	465	7,663	8,210	9,525	14,048	1,477
	SOUTH DAKOTA	55,405	46,523	287	506	173	711	5,037	2,168
	NEBRASKA	15,651	11,438	2,014	617	55	317	1,210	0
	NORTH DAKOTA	11,463	10,513	0	0	468	0	482	0
NC Subtotal	----------	3,757,018	1,476,370	284,506	140,424	49,460	968,562	599,414	238,282
So.	FLORIDA	1,825,055	583,196	119,705	18,062	2,397	804,342	297,353	0
	TEXAS	1,011,478	463,838	99,985	19,474	827	179,437	247,917	0
	WEST VIRGINIA	949,651	311,312	22,379	19,426	12,748	374,368	197,084	12,334
	NORTH CAROLINA	647,857	127,009	43,090	24,453	20,661	244,630	188,014	0
	VIRGINIA	552,621	185,473	24,800	15,217	2,799	131,801	113,823	78,708
	LOUISIANA	519,228	175,346	5,176	6,267	2,834	221,332	108,273	0
	TENNESSEE	472,462	167,799	39,040	35,761	10,286	122,486	97,090	0
	KENTUCKY	448,213	73,999	19,010	35,864	6,833	149,011	156,401	7,095
	ALABAMA	378,214	94,973	31,027	19,267	2,356	134,516	96,075	0
	GEORGIA	333,531	137,415	29,718	14,616	13,607	30,265	107,910	0
	MISSISSIPPI	202,475	69,343	12,516	32,355	1,504	36,145	50,612	0
	ARKANSAS	197,793	105,899	18,764	6,960	3,296	36,667	26,207	0
	SOUTH CAROLINA	176,595	54,581	1,626	8,502	0	41,485	70,401	0
	MARYLAND	101,615	33,166	11,413	3,984	164	36,218	13,554	3,116
	DELAWARE	87,222	23,411	1,906	0	288	38,865	21,892	860
	OKLAHOMA	78,778	26,105	9,991	5,883	892	10,202	25,705	0
	Dist. Of Columbia	0	0	0	0	0	0	0	0
So Subtotal	----------	7,982,788	2,632,865	490,146	266,091	81,492	2,591,770	1,818,311	102,113
W.	CALIFORNIA	543,165	251,731	2,870	8,413	8,188	173,211	98,752	0
	ARIZONA	284,422	180,196	20,294	2,039	736	34,294	46,863	0
	HAWAII	254,623	107,634	3,576	0	0	92,808	50,605	0
	WASHINGTON	184,297	78,896	1,839	12,407	103	50,913	38,823	1,316
	OREGON	138,885	74,518	4,725	13,957	3,037	27,519	15,129	0
	UTAH	70,440	24,853	846	5,313	795	25,164	13,469	0
	IDAHO	70,018	33,753	5,621	2,038	2,342	12,216	14,048	0
	ALASKA	65,817	21,654	0	0	0	19,218	24,945	0
	NEVADA	52,131	35,713	2,935	977	1,599	3,041	7,866	0
	COLORADO	46,433	28,712	4,273	1,463	644	2,634	8,707	0
	NEW MEXICO	36,303	27,799	271	1,029	99	2,805	4,300	0
	MONTANA	28,925	18,295	152	253	3,557	4,542	1,881	245
	WYOMING	11,950	8,356	0	1,020	468	1,453	653	0
W. Subtotal	----------	1,787,409	892,110	47,402	48,909	21,568	449,818	326,041	1,561
Terr.	Puerto Rico	261,850	49,990	783	8,149	165	118,623	84,140	0
	Micronesia	78,394	58,139	0	0	114	14,702	5,439	0
	Northern Marianas	50,011	20,485	0	0	198	5,476	23,852	0
	Guam	42,053	30,167	0	73	0	8,134	3,679	0
	Marshall Islands	32,939	24,291	0	0	0	2,164	6,484	0
	Virgin Islands	23,216	9,081	0	179	0	8,145	5,811	0
	American Samoa	19,727	5,972	0	0	0	10,615	3,140	0
	Republic of Palau	15,924	14,493	0	0	0	0	1,431	0
Terr. Subtotal	----------	524,114	212,618	783	8,401	477	167,859	133,976	0
	TOTAL NEEDS	18,058,193	6,484,629	1,021,850	592,154	185,367	5,664,683	3,599,944	509,566

Appendix table 4--Wastewater treatment facility needs, by EPA need category, 2008

REGION	STATE	TOTAL	Need category						
			I	II	IIIa	IIIb	IVa	IVb	V
			Thousands of 1988 dollars						
NE	NEW YORK	11,009,528	1,757,073	161,809	146,907	1,480,217	1,458,528	1,011,530	4,993,464
	MASSACHUSETTS	5,768,938	2,518,489	33,786	39,161	18,443	698,276	746,343	1,714,440
	NEW JERSEY	3,358,197	1,443,521	196,084	221,667	316,705	352,266	178,712	649,242
	PENNSYLVANIA	1,489,883	580,550	108,694	15,032	7,998	532,057	134,637	110,915
	CONNECTICUT	1,392,175	293,503	127,417	25,055	16,173	332,978	205,328	391,721
	NEW HAMPSHIRE	819,629	126,618	4,283	7,468	4,151	251,340	194,330	231,439
	MAINE	308,168	138,037	584	24,656	10,739	69,891	44,498	19,763
	VERMONT	209,057	64,657	28,913	1,308	4,186	19,501	16,286	74,206
	RHODE ISLAND	191,196	26,016	4,155	10	0	90,695	62,443	7,877
NE Subtotal		24,546,771	6,948,464	665,725	481,264	1,858,612	3,805,532	2,594,107	8,193,067
NC	MICHIGAN	2,951,249	736,181	8,056	64,709	21,043	384,347	652,320	1,084,593
	OHIO	2,934,975	656,557	344,488	269,116	60,828	616,492	599,998	387,496
	ILLINOIS	2,909,358	455,397	277,468	77,231	38,752	98,811	277,411	1,684,288
	WISCONSIN	1,398,645	581,504	197,972	55,664	2,486	179,783	159,352	221,884
	INDIANA	1,222,826	202,489	90,615	39,490	10,010	176,109	114,023	590,090
	MISSOURI	1,155,733	476,959	0	7,891	70,039	53,882	403,965	142,997
	MINNESOTA	1,067,081	462,968	59,821	18,376	166,276	23,146	117,939	218,555
	KANSAS	703,095	185,070	2,882	72,968	53,514	46,182	327,780	14,699
	IOWA	397,550	173,517	22,811	39,238	1,693	22,026	133,014	5,251
	NEBRASKA	112,221	61,888	2,014	617	8,041	8,228	11,203	20,230
	SOUTH DAKOTA	73,945	48,769	3,340	2,430	1,713	2,931	12,594	2,168
	NORTH DAKOTA	23,516	13,118	0	0	7,390	0	3,008	0
NC Subtotal		14,950,194	4,054,417	1,009,467	647,730	441,785	1,611,937	2,812,607	4,372,251
So.	FLORIDA	6,186,057	1,960,536	465,866	42,389	24,025	2,397,230	1,293,768	2,243
	TEXAS	4,585,806	1,876,721	591,880	243,292	78,013	315,627	1,480,273	0
	NORTH CAROLINA	1,453,303	342,123	130,452	68,896	42,425	371,511	497,128	768
	TENNESSEE	1,392,686	456,525	91,675	149,252	13,930	267,200	404,865	9,239
	KENTUCKY	1,306,050	171,110	57,261	70,007	10,738	604,964	369,232	22,738
	LOUISIANA	1,154,815	454,850	31,192	57,177	33,330	314,051	264,215	0
	GEORGIA	1,007,128	306,566	129,207	44,325	26,313	82,201	338,648	79,868
	WEST VIRGINIA	975,714	314,437	22,786	22,517	17,078	386,834	198,652	13,410
	VIRGINIA	956,857	315,723	83,421	29,813	10,001	145,991	165,681	206,227
	MARYLAND	910,907	182,466	407,937	39,714	164	51,020	220,582	9,024
	ALABAMA	782,045	232,345	92,269	92,726	18,366	152,099	194,240	0
	SOUTH CAROLINA	689,766	267,552	31,682	20,224	0	108,055	262,253	0
	MISSISSIPPI	496,348	187,318	58,389	62,605	1,504	73,662	112,870	0
	OKLAHOMA	461,133	180,161	102,064	11,158	11,851	29,081	126,818	0
	ARKANSAS	371,546	189,389	25,967	56,019	3,452	46,302	50,417	0
	Dist. Of Columbia	277,768	99,027	178,741	0	0	0	0	0
	DELAWARE	127,687	48,138	2,308	0	288	43,159	32,934	860
So Subtotal		23,135,616	7,584,987	2,503,097	1,010,114	291,478	5,388,987	6,012,576	344,377
W.	CALIFORNIA	6,539,715	3,306,133	79,135	358,289	652,498	397,324	705,601	1,040,735
	WASHINGTON	2,685,104	1,054,255	22,785	129,764	79,445	298,930	542,764	557,161
	OREGON	1,221,022	381,254	130,025	39,786	146,986	294,197	126,852	101,922
	ARIZONA	978,848	610,572	81,309	2,039	2,490	54,799	227,639	0
	UTAH	581,943	396,804	64,763	38,876	3,527	30,600	47,373	0
	HAWAII	412,956	170,033	3,576	0	0	137,848	101,499	0
	ALASKA	221,721	94,381	0	4,632	0	19,218	103,490	0
	COLORADO	196,067	75,239	69,230	2,106	6,682	3,768	39,042	0
	NEW MEXICO	143,137	68,135	271	1,029	15,418	30,226	28,058	0
	NEVADA	129,303	52,509	41,465	977	2,850	17,059	14,443	0
	IDAHO	124,596	64,767	8,411	5,050	2,872	22,036	20,341	1,119
	MONTANA	60,697	18,295	4,351	253	9,137	17,221	11,061	379
	WYOMING	17,982	8,761	0	1,061	2,155	1,453	4,552	0
W. Subtotal		13,313,091	6,301,138	505,321	583,862	924,060	1,324,679	1,972,712	1,701,316
Terr.	Puerto Rico	1,592,367	586,286	4,837	37,238	14,632	476,106	452,005	21,263
	Micronesia	78,394	58,139	0	0	114	14,702	5,439	0
	Northern Marianas	50,011	20,485	0	0	198	5,476	23,852	0
	Guam	42,053	30,167	0	73	0	8,134	3,679	0
	Marshall Islands	32,939	24,291	0	0	0	2,164	6,484	0
	Virgin Islands	27,137	9,909	0	179	0	8,145	8,904	0
	American Samoa	19,727	5,972	0	0	0	10,615	3,140	0
	Republic of Palau	15,924	14,493	0	0	0	0	1,431	0
Terr. Subtotal		1,858,552	749,742	4,837	37,490	14,944	525,342	504,934	21,263
	TOTAL NEED	77,804,224	25,638,748	4,688,447	2,760,460	3,530,879	12,656,477	13,896,939	14,632,274

Appendix table 5--Small-facility treatment and service area populations, by State, 1988 and 2008

REGION	STATE	1988 TREATMENT POPULATION	1988 SERVICE AREA	REGION	STATE	2008 TREATMENT POPULATION	2008 SERVICE AREA
		Persons				Persons	
NE	PENNSYLVANIA	2,624,065	3,981,468	NE	PENNSYLVANIA	3,949,418	4,399,951
	NEW YORK	1,289,220	2,583,599		NEW YORK	2,538,474	3,337,774
	NEW JERSEY	1,013,875	2,022,105		NEW JERSEY	1,981,662	2,517,958
	MAINE	426,500	706,347		MAINE	646,489	829,118
	VERMONT	246,872	413,648		MASSACHUSETTS	554,566	802,376
	CONNECTICUT	227,249	482,146		CONNECTICUT	444,598	606,907
	MASSACHUSETTS	206,821	569,987		VERMONT	361,253	545,312
	NEW HAMPSHIRE	152,029	367,811		NEW HAMPSHIRE	347,647	493,412
	RHODE ISLAND	21,564	56,144		RHODE ISLAND	50,335	65,163
NE Subtotal	----------	6,208,195	11,183,255	NE Subtotal	----------	10 874,442	13,597,971
NC	OHIO	1,935,156	2,610,567	NC	OHIO	2,668,134	2,750,005
	ILLINOIS	1,119,584	1,457,691		ILLINOIS	1,607,313	1,647,112
	WISCONSIN	983,931	1,087,310		WISCONSIN	1,438,207	1,440,404
	IOWA	876,699	1,061,303		IOWA	1,191,395	1,215,850
	MICHIGAN	775,263	1,346,437		MICHIGAN	1,158,617	1,567,583
	MINNESOTA	722,074	881,166		INDIANA	1,047,263	1,068,832
	INDIANA	636,979	908,225		MINNESOTA	1,039,763	1,100,567
	KANSAS	577,092	658,043		KANSAS	738,252	745,855
	NEBRASKA	342,609	408,753		NEBRASKA	450,850	457,253
	SOUTH DAKOTA	243,419	293,397		MISSOURI	386,382	397,979
	MISSOURI	228,367	323,900		NORTH DAKOTA	365,087	367,119
	NORTH DAKOTA	151,694	243,352		SOUTH DAKOTA	284,674	286,833
NC Subtotal	----------	8,592,867	11,280,144	NC Subtotal	----------	12,375,937	13,045,392
So.	TEXAS	2,661,519	3,246,218	So.	TEXAS	4,557,079	4,582,801
	FLORIDA	1,282,556	2,035,419		FLORIDA	3,331,211	3,548,477
	VIRGINIA	839,529	1,384,854		VIRGINIA	1,910,439	1,958,081
	LOUISIANA	784,413	1,220,522		GEORGIA	1,761,877	1,882,145
	GEORGIA	781,483	1,205,357		LOUISIANA	1,479,558	1,489,362
	NORTH CAROLINA	616,425	1,317,971		NORTH CAROLINA	1,333,289	1,700,811
	SOUTH CAROLINA	539,120	786,474		WEST VIRGINIA	1,072,544	1,081,139
	ARKANSAS	530,329	753,358		ALABAMA	1,017,843	1,060,590
	WEST VIRGINIA	527,500	845,354		SOUTH CAROLINA	996,912	1,057,180
	OKLAHOMA	519,677	641,066		ARKANSAS	958,220	962,717
	ALABAMA	490,369	775,436		MARYLAND	824,000	853,483
	MISSISSIPPI	440,718	629,256		TENNESSEE	781,925	856,103
	KENTUCKY	431,048	723,541		KENTUCKY	779,469	934,265
	MARYLAND	423,812	758,297		OKLAHOMA	749,102	769,712
	TENNESSEE	423,716	695,779		MISSISSIPPI	688,160	722,508
	DELAWARE	111,826	209,388		DELAWARE	253,926	271,837
	Dist. Of Columbia	0	0		Dist. Of Columbia	0	0
So Subtotal	----------	11,404,040	17,228,290	So Subtotal	----------	22,495,554	23,731,211
W.	CALIFORNIA	2,089,969	2,817,293	W.	CALIFORNIA	3,725,091	3,768,326
	ARIZONA	747,449	946,505		ARIZONA	1,409,249	1,425,257
	COLORADO	607,611	770,838		COLORADO	1,184,944	1,185,309
	WASHINGTON	569,374	816,460		WASHINGTON	1,007,966	1,038,674
	OREGON	332,221	398,690		OREGON	506,377	520,248
	IDAHO	239,234	290,745		IDAHO	437,245	444,633
	MONTANA	210,759	254,661		NEVADA	406,824	410,454
	UTAH	203,905	247,914		HAWAII	367,734	367,734
	NEW MEXICO	188,352	223,931		UTAH	363,322	363,535
	NEVADA	182,182	338,683		MONTANA	280,889	282,716
	WYOMING	152,499	199,648		NEW MEXICO	262,701	298,526
	HAWAII	67,187	216,270		WYOMING	261,570	261,621
	ALASKA	33,398	55,160		ALASKA	107,737	109,646
W. Subtotal	----------	5,624,140	7,576,798	W. Subtotal	----------	10,321,649	10,476,679
Terr.	Puerto Rico	86,162	395,580	Terr.	Puerto Rico	323,051	462,639
	Guam	85,274	114,943		Guam	212,405	227,945
	Virgin Islands	48,594	65,814		Virgin Islands	81,668	88,297
	Micronesia	8,500	72,714		Micronesia	56,624	121,083
	Marshall Islands	8,000	21,023		Northern Marianas	40,700	42,200
	American Samoa	5,911	30,288		American Samoa	39,850	43,850
	Northern Marianas	1,583	29,712		Marshall Islands	28,202	40,646
	Republic of Palau	1,057	15,769		Republic of Palau	18,920	32,046
Terr. Subtotal	----------	245,081	745,843	Terr. Subtotal	----------	801,420	1,058,706
	TOTAL POPULATION	32,074,323	48,014,330		TOTAL POPULATION	56,869,002	61,909,959

Appendix table 6--Treatment and service area populations, by State, 1988 and 2008

Appendix table 6--Treatment and service area populations, by State, 1988 and 2008

REGION	STATE	1988 TREATMENT POPULATION	1988 SERVICE AREA	REGION	STATE	2008 TREATMENT POPULATION	2008 SERVICE AREA
		Persons				Persons	
NE	NEW YORK	12,454,682	17,362,932	NE	NEW YORK	16,594,305	18,085,250
	PENNSYLVANIA	9,507,619	11,326,101		PENNSYLVANIA	10,847,519	11,439,135
	NEW JERSEY	6,319,804	8,086,099		NEW JERSEY	8,787,971	9,664,138
	MASSACHUSETTS	4,142,992	5,758,420		MASSACHUSETTS	6,157,108	7,085,237
	CONNECTICUT	1,993,750	2,975,031		CONNECTICUT	3,178,440	3,656,588
	MAINE	675,899	1,010,580		NEW HAMPSHIRE	995,965	1,204,250
	NEW HAMPSHIRE	555,417	879,804		MAINE	959,129	1,182,788
	RHODE ISLAND	481,963	793,674		RHODE ISLAND	706,400	860,383
	VERMONT	416,854	654,615		VERMONT	558,521	819,172
NE Subtotal		36,548,980	48,847,256	NE Subtotal		48,785,358	53,996,941
NC	ILLINOIS	9,876,119	10,886,543	NC	ILLINOIS	11,392,839	11,444,184
	OHIO	7,018,725	8,493,143		OHIO	9,040,054	9,174,676
	MICHIGAN	6,391,391	7,433,315		MICHIGAN	6,975,484	7,513,469
	MISSOURI	4,006,878	4,434,544		MISSOURI	6,266,932	6,313,849
	WISCONSIN	3,540,921	3,742,006		WISCONSIN	4,544,573	4,547,325
	MINNESOTA	3,066,501	3,380,428		MINNESOTA	3,817,748	3,906,010
	INDIANA	2,661,972	3,276,356		INDIANA	3,806,138	3,839,144
	KANSAS	1,843,898	2,135,929		KANSAS	3,441,294	3,449,894
	IOWA	1,479,666	1,713,374		IOWA	1,876,709	1,901,164
	NEBRASKA	1,123,675	1,267,067		NEBRASKA	1,515,698	1,522,101
	SOUTH DAKOTA	466,609	656,107		SOUTH DAKOTA	695,453	697,612
	NORTH DAKOTA	369,205	500,919		NORTH DAKOTA	667,466	669,498
NC Subtotal		41,845,560	47,919,731	NC Subtotal		54,040,388	54,978,926
So.	TEXAS	12,857,174	14,317,362	So.	TEXAS	19,206,726	19,236,998
	FLORIDA	8,210,220	11,522,442		FLORIDA	16,613,362	17,449,502
	VIRGINIA	4,055,421	4,986,714		GEORGIA	6,617,812	6,882,869
	GEORGIA	3,706,799	4,934,479		VIRGINIA	6,243,183	6,306,710
	LOUISIANA	3,137,056	4,050,460		LOUISIANA	4,652,707	4,872,343
	MARYLAND	2,731,195	3,388,137		NORTH CAROLINA	4,125,952	4,891,048
	ALABAMA	2,397,248	3,073,698		TENNESSEE	4,034,882	4,281,205
	TENNESSEE	2,370,360	3,413,524		ALABAMA	3,698,282	3,759,459
	OKLAHOMA	2,343,756	2,599,246		SOUTH CAROLINA	3,447,400	3,571,281
	NORTH CAROLINA	2,334,124	3,775,204		OKLAHOMA	3,207,376	3,249,824
	SOUTH CAROLINA	1,843,568	2,720,597		MARYLAND	3,170,185	3,265,874
	KENTUCKY	1,692,822	2,372,854		KENTUCKY	2,949,280	3,198,316
	ARKANSAS	1,464,178	1,807,604		ARKANSAS	2,593,033	2,599,821
	MISSISSIPPI	1,390,123	1,791,736		MISSISSIPPI	1,891,503	1,987,045
	Dist. Of Columbia	1,299,989	1,311,447		WEST VIRGINIA	1,780,027	1,791,403
	WEST VIRGINIA	1,062,470	1,400,626		Dist. Of Columbia	1,683,122	1,683,122
	DELAWARE	566,647	749,081		DELAWARE	811,207	916,080
So Subtotal		53,463,150	68,215,211	So Subtotal		86,726,039	89,942,900
W.	CALIFORNIA	24,088,239	26,029,898	W.	CALIFORNIA	32,810,093	32,984,968
	WASHINGTON	3,288,335	4,127,156		WASHINGTON	5,181,880	5,496,557
	COLORADO	3,247,323	3,618,450		COLORADO	5,034,407	5,034,772
	ARIZONA	2,813,112	3,258,558		ARIZONA	4,669,714	4,706,699
	OREGON	1,738,029	2,039,020		OREGON	2,689,218	2,705,420
	UTAH	1,411,840	1,640,023		UTAH	2,323,250	2,323,463
	IDAHO	1,008,252	1,125,622		NEW MEXICO	1,509,551	1,548,437
	NEW MEXICO	940,708	1,053,061		HAWAII	1,453,032	1,453,968
	HAWAII	811,300	1,107,576		NEVADA	1,110,219	1,123,377
	NEVADA	685,182	885,657		IDAHO	1,083,213	1,095,571
	MONTANA	450,754	523,613		WYOMING	716,326	716,377
	WYOMING	380,927	532,526		ALASKA	656,475	682,078
	ALASKA	329,659	458,183		MONTANA	629,756	632,777
W. Subtotal		41,193,660	46,399,343	W. Subtotal		59,867,134	60,504,464
Terr.	Puerto Rico	1,634,015	3,007,020	Terr.	Puerto Rico	3,517,091	4,242,914
	Guam	85,274	114,943		Guam	212,405	227,945
	Virgin Islands	71,425	92,467		Virgin Islands	107,880	114,509
	Micronesia	8,500	72,714		Micronesia	56,624	121,083
	Marshall Islands	8,000	21,023		Northern Marianas	40,700	42,200
	American Samoa	5,911	30,288		American Samoa	39,850	43,850
	Northern Marianas	1,583	29,712		Marshall Islands	28,202	40,646
	Republic of Palau	1,057	15,769		Republic of Palau	18,920	32,046
Terr. Subtotal		1,815,765	3,383,936	Terr. Subtotal		4,021,672	4,865,193
	TOTAL POPULATION	174,867,115	214,765,477		TOTAL POPULATION	253,440,591	264,288,424

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