

The COST of CLEAN WATER

*A Sewer User
Charge Rate Survey
and Guidance Manual*



STATE OF CONNECTICUT
Department of Environmental Protection

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Arthur J. Rocque, Jr., Commissioner

The COST of CLEAN WATER

A Sewer User Charge Rate Survey and Guidance Manual

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The Cost of Clean Water

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NOTE: All data presented in this document was gathered during the spring and summer of 1997 and represents fiscal and staffing information for that year.

Introduction:

What Is A User Charge System?

A User Charge System is a revenue generating system designed to recover the total cost of operating the wastewater collection and treatment system of a municipality. It should be designed to make the wastewater utility financially self-sufficient, place the costs of pollution abatement directly on the sources of pollution (in proportion to their contribution), and encourage the conservation of potable water. An adequate, approvable User Charge System is a prerequisite for any municipality receiving financial assistance for pollution abatement projects through the Clean Water Fund administered by the State of Connecticut Department of Environmental Protection (DEP).

Why Is Such A System Needed ?

There are many good reasons for implementing a structured User Charge system:

- To ensure that sufficient revenue is generated to operate the facilities.
- To ensure that the wastewater discharge receives sufficient treatment to meet the limits set by its federal (NPDES) or state (SPDES) discharge permit.
- To isolate the funding of the water pollution control facilities from the rest of the municipal budget.
- To insure that proper maintenance is performed to prevent failure of critical wastewater treatment processes and to prevent overflows of untreated sewage from the wastewater collection system.
- To insure that preventative maintenance is routinely performed, protecting the infrastructure investment already made by the municipality and extending the useful life of the treatment system.

Sufficient Revenue

The most important reason for establishing a user charge system is to provide a consistent level of funding for the operation and maintenance of the wastewater facilities. When we refer to wastewater facilities, we mean not only the wastewater treatment plant, but also the structures used to convey the wastewater such as the pumping stations, force mains, gravity sewers, and municipally owned grinder pumps. With consistent funding, the planning and execution of a proper operation and maintenance schedule becomes easier, and both the community and the environment benefit. Routine preventative maintenance is less expensive, in the long run, than conducting emergency repairs.

Sufficient Treatment

The municipality or municipalities that discharge to the sanitary sewer system are ultimately responsible for the proper operation of the wastewater conveyance and treatment facilities. This responsibility includes complying with the discharge limits contained in the facility's discharge permit. Violation of the permit limits in the facility's treated effluent discharge or hydraulic bypasses of critical treatment processes can result in:

- ✓ Damage to the environment
- ✓ Risks to public health, or
- ✓ Costly fines which will be passed on to the user in the form of higher rates.

It is therefore in everybody's best interest to make sure that the facility is funded sufficiently to allow it to operate without problems.

Isolation Of WPCF Funding

When budget cutting time comes, elected officials often need to look for places to cut the budget which will cause the least amount of controversy. In the past, this has made the water pollution control facilities an easy target. Very few people (except those living near the treatment facilities) would complain about reduced funding for water pollution control. As a result, many facilities suffered from chronic underfunding, leading to poor operation and maintenance of the facilities. To further compound the problem, extended periods of delayed maintenance often led to catastrophic failures of the mechanical processes, resulting in the need for wholesale replacement of those processes.

To address this problem, all wastewater treatment facilities which have received construction funding assistance from the State or Federal government since 1974 have been required to develop and implement user charge systems which isolate the operation and maintenance budget from the rest of the municipal budget. In this way, the water pollution control facilities become financially separate from the rest of town government, and are generally less subject to the uncertainties of year-to-year municipal budget setting. Note that the isolation of water pollution control money is not just a suggestion, it is mandated by Section 7-267 of the Connecticut General Statutes (CGS), a copy of which is included in Appendix 2.

Note that setting the annual budget for wastewater facilities and the establishment of user charge rates is the responsibility of the Water Pollution Control Authority (WPCA) (CGS Section 7-255). In most cases, this means that other municipal boards and commissions do not have any direct input or overview in the water pollution control budget process. In particular, neither the board of selectman nor the board of finance have rate-setting or review authority in this matter. However, an informational public hearing is required by that same statute to present the WPCA budget to the public and educate them regarding the details of the budget and rate structure for the coming year.

Basic Concepts: How Much Money To Budget

If you have previous records of operational costs, you have a fair idea of the day-to-day costs of operating the facility. To start, find a copy of last year's budget, and determine what your total cost was for treating wastewater. Be sure to include:

- All labor costs including operation, maintenance, management, administrative support, and personnel services. Remember to include not just the crew at the treatment facility, but also any field crews responsible for sewer system and pumping station maintenance.
- All indirect costs such as FICA, retirement, insurance, etc.

- All costs of energy, including electricity, gas, oil, etc
- All costs of chemicals (such as chlorine, lime, permanganate) and laboratory supplies
- The cost of tools, maintenance equipment, and replacement parts needed both for occasional repairs as well as for preventative maintenance.
- Vehicle costs, including sewer system maintenance vehicles
- Any contract operations such as sludge hauling and disposal, pipeline cleaning, legal or consulting services, billing services, etc.
- Special administrative costs such as permit fees, membership dues, and staff training (continuing education for personnel, conferences and seminars, etc.)
- Contributions to a sinking, or replacement, fund to allow for replacement of significant mechanical components which may be expected to wear out at least once during the design life of the facility.

Once you have compiled all of last year's information, ask yourself the following questions:

- Were all of last year's costs covered by income from the existing user charge system?
- Do you have a good preventative maintenance program ?
- Do you maintain a reasonable spare parts inventory ?
- Is sewer system maintenance planned for and performed on an annual basis?
- Has your water pollution control facility operated without permit violations in the past year ?
- Have you, within the past 3 to 5 years, done a budget analysis to determine the proper funding level for your sinking fund?
- Do you have sufficient personnel to perform normal maintenance and operations functions?
- Are your personnel properly trained to perform their jobs? Do you have a reasonable training budget to maintain and improve staff skills?
- Did your budget include all of the categories from the previous list above?

If the answer to any of these questions was "No," then you should probably be making changes in your budget (and increases in your user charges) to address these deficiencies.

Which Costs Must Be Covered?

Your user charge system must be designed to cover all the costs of operating and maintaining the wastewater collection and treatment system, including intermittent replacement of significant mechanical components, as well as major maintenance items. All labor costs (both direct and overhead), energy costs, chemical costs, fuel costs, transportation, contract costs and insurance must be reflected in the overall cost upon which your user charge system is based.

Can Debt Service Costs Be Included?

The user charge system may also be used as a vehicle for billing debt service costs. If this is done, however, all debt service costs must be clearly identified and kept separate on the bill from operation and maintenance costs, and funds collected must be kept separate from one another. Note that the discussion which follows is NOT related to the recovery of debt service costs.

Who Must Pay User Charges?

Everyone who uses the sewer system is responsible for paying their fair share of the cost of wastewater conveyance and treatment. No one is exempt. This means industrial, commercial, and institutional (i.e. churches, schools, town hall, etc.) users, as well as residential users, are responsible for the cost of insuring that their wastewater is properly treated and the environment is adequately protected from pollution. Please note that a User Charge system is not a tax, so any arguments from tax-exempt groups regarding relief from their billing on this basis is inappropriate. The only exemptions from paying user charges are those required by state statute (see Appendix 2). These exceptions come under the category of low income, moderate income, and elderly housing projects whose construction is funded by state and federal government, and whose operation is generally managed by a local housing authority. They are required to make payments to the municipality of only a fraction of their actual tax bills or other municipal charges; this is referred to as "Payment In-Lieu Of Taxes" or PILOT.

What To Base Your Billings On

The user charge of greatest concern to most people is the annual charge to the typical residence for wastewater treatment services for the year. It should represent the actual cost of services provided to the property owner, including operations, maintenance, administration, and reserve costs. Some communities also recover the costs of wastewater-related capital projects through the User Charge billing system. Note that if capital costs are recovered in this manner, rather than by benefit assessment, the portion of the total bill attributable to capital cost recovery should be clearly indicated on the bill, either as a separate line item or as a statement of percentage of total billing.

A few municipalities still utilize an Ad Valorem system; that is, all costs of wastewater treatment are recovered through general taxation. In general, this situation occurs in larger municipalities where a significant portion of the total population is served by sewers. Since the last survey in 1993, however, a number of these municipalities, including Waterbury and Bridgeport, have switched to a use-based method. Most municipalities rely on a direct user charge to the customer (see table 4) which generally reflects each user's proportional share of the total cost of operation and maintenance of the wastewater collection and treatment system.

The existence of a viable, self-sustaining User Charge system has been a major program requirement for municipalities receiving Federal or State funding assistance on water pollution control projects. In general, both DEP and USEPA have discouraged the creation of new Ad Valorem systems, and have carefully examined those few that have been approved since 1974. Over the past two decades, most municipalities in Connecticut have chosen to adopt or change to an independent User Charge system.

Ultimately, user charges are to be based on the proportional share of flow and strength of wastewater each user contributes to the total flow which is being treated at the wastewater treatment facility. In practice this can take one of several forms:

The Unit Charge Method

The simplest user charge system is the Unit Charge method. This is most commonly used where a significant percentage of the total flow is from areas without public water supplies. Since no method of metering water supplies is available, each residential unit is charged the same rate, called an Equivalent Dwelling Unit, or EDU. Commercial, industrial, and institutional properties are charged on a similar basis; the user charge system will specify how many EDUs a particular use will be charged. Large volume users (over 25,000 gallons per day) will generally prefer to have their water use metered so that they can be billed on actual, rather than estimated, water use. These large volume users include commercial and industrial facilities as well as large residential units, such as condominiums and health care facilities. In these cases, a meter is placed on all water sources leading into the facility, or on their wastewater discharge line. The municipality is generally responsible for taking readings of the water use.

While this system is certainly the easiest to implement (generally requiring only the information found in the assessor's office) it can lead to some inequities. It does not reward users who conserve water, and levies the same rate against all users regardless of lifestyle, number of occupants, or water usage.

The Actual Volume Method

The most equitable form of user charge is to base the billings on actual volume of water which the user discharges to the sewer line. Unfortunately, most structures don't have a meter on their sewer line. In areas with public water supply, however, the volume of water delivered to the structure is usually readily available. Using water consumption as a basis for sewer use charges is the most equitable billing method available. Those who conserve water are rewarded with lower sewer use bills, and those who use a greater volume are billed for that volume.

While this method has the advantage of being the most equitable form of cost apportionment, it also has its shortcomings. First, it requires a greater level of effort, since flow measurements must be collected from the appropriate water authority, then recoded and reentered into the water pollution control facility's billing system. Second, there will always be complaints about the percentage of water delivered to a property which makes its way into the sanitary sewer system. Filling swimming pools, watering large gardens, and frequent car washing are just some of the reasons people give for having their sewer bills reduced when the bills are based on metered water usage. Since most of these activities occur during the summer months, one method to address this issue is to ignore the water consumption during the summer months, and base the usage for those months on the average water consumption for the rest of the year. Ideally, a WPCA policy regarding such issues should be established before the user charge system is put into effect.

For sewer users who are not on public water, an approximation is generally made in order to generate their bills. Since they cannot be charged by actual volume used, the average water use of all residential customers within the sewer service area, or of similar residential customers, is calculated. That volume is then taken as the average residential water use for sewer customers with onsite water supplies.

Overall, this method is the one generally preferred by communities due to the inherent fairness of the billing system. In addition, it fosters a responsible stance toward water conservation by rewarding with lower utility bills those who take positive action to conserve water.

The Type And Size Method

Another method available, but seldom used, is to base the charge each building receives on the size and type of the building. While using this method provides a crude approximation of the expected flow, the number of variables (how many rooms, how many people to a room, etc.) make this a less preferred alternative for residential billing. It is more accurate for commercial and industrial facilities where the number of employees and the expected water use per employee can be better predicted by the building's square footage.

The Estimated Occupancy Method

This is a variation on the previous method. Using the estimated occupancy method seeks to estimate the flows from a property by estimating how many people customarily use the property. This method bases the residential estimates on the number of bedrooms, rather than the size of the house. The flow from commercial facilities, such as restaurants, is based on the number of customers expected.

The Total Fixture Method

A similar method of distributing the cost of wastewater services is the Total Fixture method. In this case, the user is billed based on the number and type of water fixtures in the house. Good coordination with the building inspector can help maintain a generally accurate database on which to base billings. This is slightly more difficult to manage, since the number and type of fixtures can be modified by home improvement projects. While this may lead to slightly more accurate billings (assuming houses with more fixtures generate more flow), it still leaves room for error and does not reward those who practice water conservation with conventional fixtures. It also does not reflect changes in water use from year to year as the number of occupants or lifestyle changes. Large volume commercial, industrial, and residential users must still be handled on a case-by-case basis.

Special Note Regarding The Actual Volume Method

Greater care must be taken when using the Actual Volume method to avoid a common and expensive mathematical error. Extraneous water entering the sewer system, known as infiltration and inflow (I/I) commonly makes up a small, but distinctive, portion of the total flow entering a water pollution control facility. If the billings to sewer users are based on the ratio of a property's flow to the total flow entering the water pollution control facility, then a cash shortfall will occur. This is because no one will wind up being billed for the I/I flow entering the treatment facility.

Each property's billing should be based on the ratio of its flow to the total of all discharges to the WPCF. The example below illustrates this potential problem:

EXAMPLE #1

Plainbury, Connecticut has an annual water pollution control budget of \$500,000, and measures incoming flow at 1,000,000 gallons per day (gpd) at the plant. All the users discharging to the sanitary sewer system are on a public water supply. The water company records, which are considered accurate, indicate that the total flow being sold to those on the sewer system is 800,000 gallons per day.

- a. The total annual flow to the plant is
 $1,000,000 \text{ gpd} \times 365 \text{ days} = 365,000,000 \text{ gallons}$

b. Now if the charges to the users are based on the flow entering the plant, the cost per 1,000 gallons will be

$$\$500,000 / (365,000,000/1,000) = \$1.36 \text{ per } 1,000 \text{ gallons}$$

c. The billings, based on water usage, would total

$$800,000 \text{ gpd} \times 365 \text{ days} \times \$1.36/1000 \text{ gal} = \$400,000$$

and a shortfall of \$100,000 would result. In order to avoid this problem, the actual amount of water sold to the users must be used to calculate the user charge rate

$$800,000 \text{ gallons per day} \times 365 \text{ days} = 292,000,000 \text{ gallons sold}$$

and the rate would be

$$\$500,000 / (292,000,000/1,000) = \$1.70 \text{ per } 1,000 \text{ gallons}$$

Notice the significant difference between the rates. This is the difference between the "billable rate" and the actual cost of treating incoming sewage.

Purpose Of The Survey

In 1997, the DEP conducted its third survey of Sewer User Charges statewide. The survey was designed to accumulate data regarding the cost of treatment, use and magnitude of replacement or "sinking" fund items, staffing, and other topics related to financial management of a wastewater facility. Of the 118 entities providing wastewater collection and treatment services to the public, 107 provided responses to the survey.

A number of communities in the following tables fund their wastewater facilities using an Ad Valorem system; that is, all funds for operating and maintaining the WPCF and sewer system are a part of the town budget and are recovered through general taxation. A separate, distinct User Charge system does not exist for these facilities; however, the operating and staffing data are still considered valuable to municipal officials trying to see where they "fit in" compared to other towns. Note that, while DEP has approved several existing Ad Valorem systems, the creation of a new Ad Valorem system in a municipality is not allowed.

A number of the respondents operate more than one water pollution control facility (WPCF), such as:

Bridgeport: 2 WPCFs

Metropolitan District (MDC): 4 WPCFs

(Hartford, East Hartford, Rocky Hill, Windsor)

Milford: 2 WPCFs

Plainfield: 2 WPCFs

Ridgefield: 2 WPCFs

Stonington: 3 WPCFs

Information for each jurisdiction with multiple facilities is summarized on a single line in the listings which follow. The following sections contain the summaries of the data collected, sorted by the topic in question. For reference, the key to the heading on the tables is listed below:

1997-98 Budget: The reported wastewater budget for fiscal year 1997-98

% Sinking Fund: Sinking Fund as a percentage of the 1997-98 Budget, after Capital Costs are deducted.

Admin / MG: Administrative staff per million gallons of wastewater treated on a daily basis.

Ave Flow 1997: The average daily flow at the facility (or facilities) in question during 1997, according to the information reported on their discharge monitoring records. For systems with sanitary sewers that discharge to another municipality, the flow listed is that reported on the survey form. Not all sewer systems reported their flows.

Billing Frequency: Number of times per year that a billing is sent out to the typical residential customer.

Capital Costs: The portion of the costs which are attributable to the retirement of capital debt and therefore not directly related to the cost of treatment.

Collection Rate: The percentage of customers who pay their bill within one year of the billing date.

Cost / 1000 gal: A calculated value: $(1997-98 \text{ Budget} - \text{Capital Costs}) / \text{Ave Flow 1997}$

Design Flow: The design capacity of the treatment facility. Where the jurisdiction has more than one facility, the design flow is the combined capacity of all the facilities. A zero in this column indicates that the community discharges its sanitary sewers to an adjoining jurisdiction.

Grinder pumps: The number of installed grinder pumps, which are generally sized to serve an individual residential unit.

Industrial Billing: The method of billing industries for their discharges

- N/A: Not applicable, no industrial discharges
- E: Estimated equivalent dwelling units
- M: Metered flow (discharge is metered)
- Mw: Metered flow based on water consumption
- S: Surcharges for high strength wastes
- O: Other methods

Industrial Flow: The estimated flow being discharged into the system from industrial sources.

Industrial % Flow: A calculated value: $\text{Industrial Flow} / \text{Ave Flow 1997}$

Large PS: The number of large (greater than 500,000 gallons per day) pumping stations in the collection system.

Load Type: The size of a "load" of septage for billing purposes. "N/A" indicates septage disposal is not available at that facility, "NC in town only" means no charge, but available to town residents only.

Maint cost per mile: A calculated value: Sewer Maint / Miles of Sewer

Miles of Sewer: The number of miles of publicly owned sanitary sewers in the jurisdiction.

O&M / MG: Operation and Maintenance staff per million gallons of wastewater treated on a daily basis.

Other Costs: Other costs which might not be included in the WPCF budget, but are related to the operation and maintenance of the facility, such as billing, clerical support, insurance, legal, etc. and are carried in the general town budget.

Percent Capacity: Average flow as a percentage of design flow.

Replacement (Sinking Fund): The portion of the costs which are dedicated to a separate fund for the replacement or repair of major mechanical components.

Residential Bill: Bill to typical residential customer in 1997 (if billing is based on water consumption, a base flow of 70,000 gallons per year was to be assumed for comparison purposes.)

Residential Billing Method: The method used to determine the bill to a typical residential customer:

Flow: Bill is based on water consumption records

Unit: Bill is based on equivalent dwelling units; that is, each residential unit receives the same bill.

Unit + Flow: Billing is a combination of a fixed rate per residential unit served, plus a component based on water consumption

Ad Val: Billing is based on property value, and is part of property tax bill

Residential Units: The estimated number of residential units being served by sanitary sewers within the jurisdiction.

Septage in-town Cost: The cost to residents for disposing of a load of septage at the WPCF.

Septage out-of-town: The cost to dispose of a load of septage at the WPCF.

Sewer Maint: The portion of the total budget allocated to the maintenance of the collection system, including pipe cleaning, pump station maintenance and repair, and other non-treatment costs. Many towns had a problem quantifying this number.

Small PS: The number of small (less than 500,000 gallons per day) pumping stations in the collection system, not including individual grinder pumps.

Staff: Admin: The number of administrative staff allocated to the operation of the facilities. Each part time person was counted as 0.5 for this column. Note that, since we weren't specific in the survey, this category may include the superintendent, as well as billing, clerical, and managerial staff.

Staff: O&M: The number of operation and maintenance staff allocated to the operation of the facilities. Each part time person was counted as 0.5 for this column.

Staff: Sewers: If the facility has a separate staff designated to the operation and maintenance of the collection system (pipelines and pumping stations), it's listed here.

Total Staff: Total staffing at the facility. Total = Admin + O&M + Sewer

Town: The name of the municipality or facility providing the information

Treatment: The type of treatment being provided by the facility in 1997:

Seco: Secondary Treatment (BOD/SS limits of 30/30 ppm)

Seco P: Secondary Treatment with Phosphorus removal

AWT: Advanced waste treatment (BOD/SS limits of 20/20 ppm or better)

Nitrif: Facility designed and operated to nitrify

Denitr: Facility designed and operated to denitrify

N/A: Sewers discharge to one or more other communities

The Magnitude Of The Problem: How Much Wastewater Do We Treat?

Table 1 is sorted in order of increasing average daily flows as reported from each facility during 1997. Note that this does not reflect the actual design capacity of the facility, and that some of these facilities may be at 90% of their design flow, while others may be at as little as 20%. This is an important consideration, as many of the tables and figures which follow calculate relationships between WPCFs based on the actual flow through the facility. Most treatment facilities operate the most efficiently at 60% to 95% of their rated capacity, so facilities with a significant underload may not be operating in their best cost range, although this can be compensated for through the flexibility of the facility design and the skill of the operator.

Figure 1: Level of Treatment of Sewage at Connecticut WPCFs

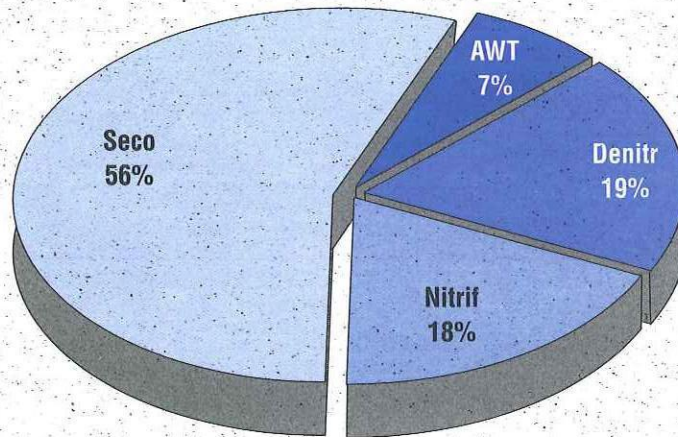


Figure 1 shows the percentage, by volume of wastewater treated, of each type of municipal treatment in Connecticut.

- Seco: Secondary Treatment (BOD/SS limits of 30/30 ppm)
- AWT: Advanced waste treatment (BOD/SS limits of 20/20 ppm or better)
- Nitrif: Facility designed and operated to nitrify
- Denitr: Facility designed and operated to denitrify

TABLE 1
How Much Wastewater Do We Treat?

Town	Design Flow	Ave Flow 1997	Per cent Capacity	Treatment	1997-98 Budget
Redding	17,000	6,000	35%	Denitr	\$60,000
Somers	65,000	39,000	60%	Seco	\$37,000
Coventry	200,000	59,000	30%	Seco	\$95,030
Deep River	165,000	84,000	51%	Seco	\$353,091
Kent	140,000	84,000	60%	Seco	\$177,140
Goshen	80,000	86,000	108%	AWT	\$466,100
Sprague	400,000	182,000	46%	Seco	\$127,896
Ledyard	240,000	183,000	76%	Seco	\$325,286
Thompson	1,359,000	226,000	17%	Seco	\$289,000
Norfolk	350,000	244,000	70%	AWT	\$203,169
Beacon Falls	500,000	248,000	50%	Seco	\$186,245
North Canaan	340,000	280,000	82%	Seco	\$255,350
Jewett City	500,000	313,000	63%	Seco	\$372,233
Southbury - Heritage Vil	780,000	425,000	54%	Seco	\$350,000
Canton	800,000	487,000	61%	AWT	\$430,822
Salisbury	670,000	491,000	73%	AWT	\$255,114
New Milford	1,000,000	517,000	52%	Seco P	\$1,089,679
Litchfield	770,000	544,000	71%	Seco	\$523,628
Portland	1,000,000	641,000	64%	Seco	\$490,000
Ridgefield	870,000	679,000	78%	Denitr	\$820,000
Suffield	1,500,000	805,000	54%	Seco	\$1,193,261
Watertown	1,000,000	831,000	83%	Seco	\$495,750
Thomaston	1,200,000	893,000	74%	Seco	\$562,759
Plymouth	1,750,000	928,000	53%	Denitr	\$700,064
East Hampton	3,900,000	1,080,000	28%	Seco	\$509,592
Putnam	2,910,000	1,105,000	38%	Seco	\$787,323
Plainfield	1,787,000	1,142,000	64%	Seco	\$650,000
Seymour	2,930,000	1,223,000	42%	Denitr	\$700,000
East Windsor	2,500,000	1,315,000	53%	Seco	\$840,000
Stafford	2,000,000	1,343,000	67%	Nitrif	\$694,315
Stonington	2,840,000	1,348,000	47%	Seco	\$1,730,000
Windsor Locks	2,120,000	1,368,000	65%	Seco	\$1,050,150
Winchester	3,500,000	1,419,000	41%	Nitrif	\$1,319,404
New Canaan	1,500,000	1,465,000	98%	Seco	\$740,433
Derby	3,030,000	1,493,000	49%	Seco	\$1,391,549
Westport	2,850,000	1,865,000	65%	Denitr	\$2,230,493
Cheshire	3,500,000	1,953,000	56%	Nitrif	\$1,249,375
Glastonbury	3,640,000	2,029,000	56%	Seco	\$1,100,200
Groton (City)	3,100,000	2,073,000	67%	Seco	\$1,400,885
Plainville	3,800,000	2,141,000	56%	Nitrif	\$1,661,315
South Windsor	3,750,000	2,151,000	57%	Seco	\$1,238,484
Ansonia	3,500,000	2,199,000	63%	Seco	\$835,494
Shelton	2,575,000	2,263,000	88%	Seco	\$1,307,380
Simsbury	2,850,000	2,291,000	80%	Seco	\$1,000,000

How Much Wastewater Do We Treat?, *continued*

Town	Design Flow	Ave Flow 1997	Per cent Capacity	Treatment	1997-98 Budget
Montville	3,400,000	2,357,000	69%	Seco	\$2,329,080
Windham	5,500,000	2,570,000	47%	Seco	\$1,710,135
Killingly	8,000,000	2,707,000	34%	Seco	\$1,860,304
Groton (Town)	5,000,000	3,157,000	63%	Seco	\$3,459,107
North Haven	4,570,000	3,453,000	76%	Nitrif	\$1,648,841
Farmington	5,650,000	3,678,000	65%	Nitrif	\$2,341,527
Branford	4,500,000	3,884,000	86%	Seco	\$1,076,018
Norwich	8,500,000	3,940,000	46%	Seco	\$3,208,690
Middletown	6,750,000	3,961,000	59%	Seco	\$2,746,781
Vernon	6,400,000	4,292,000	67%	Nitrif	\$3,292,906
Southington	7,400,000	4,330,000	59%	Nitrif	\$1,406,985
Wallingford	8,000,000	5,318,000	66%	AWT	\$4,707,547
Torrington	7,000,000	5,331,000	76%	Nitrif	\$2,733,064
Enfield	10,000,000	5,333,000	53%	Seco	\$2,089,000
Naugatuck	10,300,000	5,557,000	54%	Nitrif	\$5,000,000
Manchester	8,250,000	6,510,000	79%	Nitrif	\$4,828,074
New London	10,000,000	7,118,000	71%	Seco	\$3,618,530
West Haven	12,500,000	7,422,000	59%	Denitr	\$3,353,350
Milford	11,400,000	7,975,000	70%	Denitr	\$2,925,500
Stratford	11,500,000	8,470,000	74%	Denitr	\$3,800,000
Fairfield	9,000,000	8,861,000	98%	Seco	\$2,609,883
Meriden	11,600,000	8,951,000	77%	Nitrif	\$4,720,000
Danbury	15,500,000	9,258,000	60%	Nitrif	\$7,054,373
Bristol	10,500,000	10,657,000	101%	Nitrif	\$3,727,090
Greenwich	12,000,000	11,307,000	94%	Seco	\$5,800,000
Norwalk	15,000,000	15,070,000	100%	Denitr	\$7,995,772
Mattabassett Dist	20,000,000	17,633,000	88%	Seco	\$4,071,670
Waterbury	25,000,000	19,645,000	79%	Seco	\$12,850,403
Stamford	20,000,000	21,232,000	106%	AWT	\$9,241,000
Bridgeport	41,000,000	30,544,000	74%	Seco	\$22,937,439
New Haven	40,000,000	32,717,000	82%	Denitr	\$14,970,100
Hartford MDC	93,000,000	67,272,000	72%	Seco	\$37,700,000

TOTAL **393,051,000** gallons per day

The Municipal Budget Line: How Much Does It Cost?

Table 2 is sorted in order of increasing total wastewater budgets for communities with a WPCF. The costs reflected in this column may include capital costs for debt retirement and contributions to a sinking fund. These line items are shown in the next section, so that some idea of the proportion and frequency of such costs can be seen.

Figure 2: Comparison of Average Daily Flow to 1997 Budget

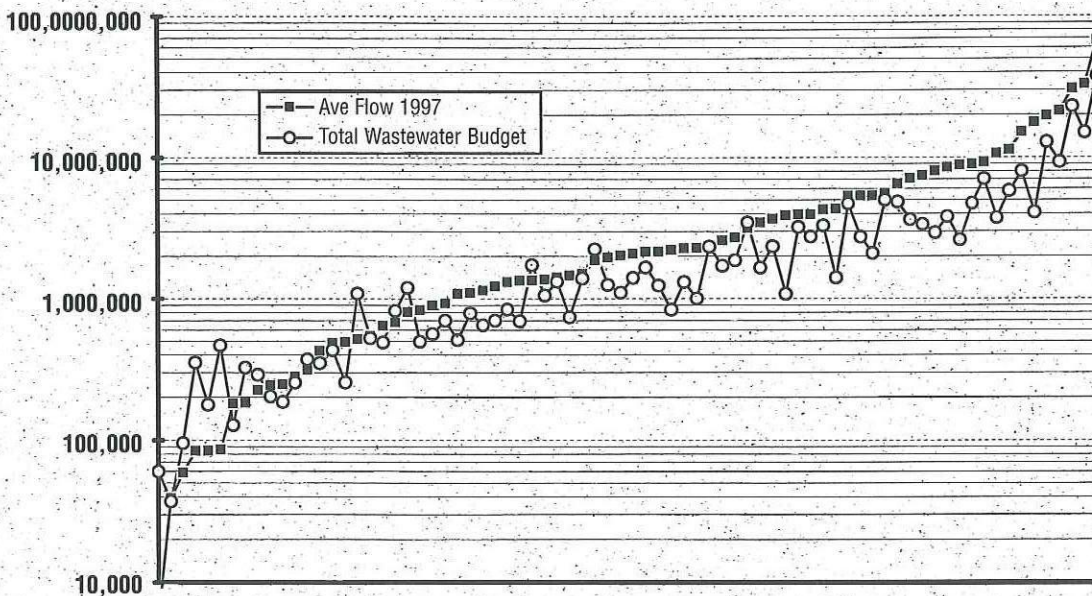


Figure 2, above, shows average daily flow and annual budget from table 2 on the same axis. As you can see, the cost of treating wastewater is generally greater than the average daily flow for facilities under 100,000 gpd, and approximately equal to the actual flow up to 1,000,000 gallons per day. For larger facilities, this ratio gradually drops to where cost is within an order of magnitude less than the treated flow. In general, the unit cost of treating wastewater is inversely proportional to the size of the facility; that is, there is an obvious economy of scale which is demonstrated by these numbers.

There are several special factors which may cause occasional divergences from the expected. The size and age of the sewer system are factors, as is the amount of maintenance actually performed by the WPCF staff. In many towns, some or all of the collection system maintenance is performed by public works staff whose cost is not reflected in these numbers. Note also that for data from communities that discharge to another jurisdiction, the capital and replacement costs carried in the user charge may be "invisible."

TABLE 2
How Much Does it Cost?

Town	1997-98 Budget	Ave Flow 1997	Design Flow	Per cent Capacity	Treatment
Somers	\$37,000	39,000	65,000	60%	Seco
Redding	\$60,000	6,000	17,000	35%	Denitr
Coventry	\$95,030	59,000	200,000	30%	Seco
Sprague	\$127,896	182,000	400,000	46%	Seco
Kent	\$177,140	84,000	140,000	60%	Seco
Beacon Falls	\$186,245	248,000	500,000	50%	Seco
Norfolk	\$203,169	244,000	350,000	70%	AWT
Salisbury	\$255,114	491,000	670,000	73%	AWT
North Canaan	\$255,350	280,000	340,000	82%	Seco
Thompson	\$289,000	226,000	1,359,000	17%	Seco
Ledyard	\$325,286	183,000	240,000	76%	Seco
Southbury - Heritage Vil	\$350,000	425,000	780,000	54%	Seco
Deep River	\$353,091	84,000	165,000	51%	Seco
Jewett City	\$372,233	313,000	500,000	63%	Seco
Canton	\$430,822	487,000	800,000	61%	AWT
Goshen	\$466,100	86,000	80,000	108%	AWT
Portland	\$490,000	641,000	1,000,000	64%	Seco
Watertown	\$495,750	831,000	1,000,000	83%	Seco
East Hampton	\$509,592	1,080,000	3,900,000	28%	Seco
Litchfield	\$523,628	544,000	770,000	71%	Seco
Thomaston	\$562,759	893,000	1,200,000	74%	Seco
Plainfield	\$650,000	1,142,000	1,787,000	64%	Seco
Stafford	\$694,315	1,343,000	2,000,000	67%	Nitrif
Seymour	\$700,000	1,223,000	2,930,000	42%	Denitr
Plymouth	\$700,064	928,000	1,750,000	53%	Denitr
New Canaan	\$740,433	1,465,000	1,500,000	98%	Seco
Putnam	\$787,323	1,105,000	2,910,000	38%	Seco
Ridgefield	\$820,000	679,000	870,000	78%	Denitr
Ansonia	\$835,494	2,199,000	3,500,000	63%	Seco
East Windsor	\$840,000	1,315,000	2,500,000	53%	Seco
Simsbury	\$1,000,000	2,291,000	2,850,000	80%	Seco
Windsor Locks	\$1,050,150	1,368,000	2,120,000	65%	Seco
Branford	\$1,076,018	3,884,000	4,500,000	86%	Seco
New Milford	\$1,089,679	517,000	1,000,000	52%	Seco P
Glastonbury	\$1,100,200	2,029,000	3,640,000	56%	Seco
Suffield	\$1,193,261	805,000	1,500,000	54%	Seco
South Windsor	\$1,238,484	2,151,000	3,750,000	57%	Seco
Cheshire	\$1,249,375	1,953,000	3,500,000	56%	Nitrif
Shelton	\$1,307,380	2,263,000	2,575,000	88%	Seco
Winchester	\$1,319,404	1,419,000	3,500,000	41%	Nitrif
Derby	\$1,391,549	1,493,000	3,030,000	49%	Seco
Groton (City)	\$1,400,885	2,073,000	3,100,000	67%	Seco
Southington	\$1,406,985	4,330,000	7,400,000	59%	Nitrif
North Haven	\$1,648,841	3,453,000	4,570,000	76%	Nitrif
Plainville	\$1,661,315	2,141,000	3,800,000	56%	Nitrif

How Much Does it Cost?, continued

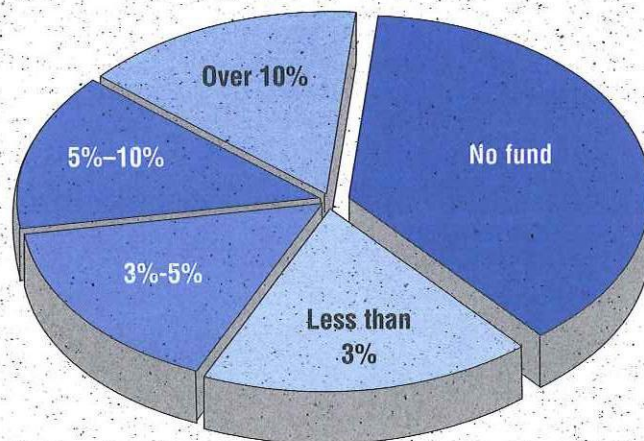
Town	1997-98 Budget	Ave Flow 1997	Design Flow	Per cent Capacity	Treatment
Windham	\$1,710,135	2,570,000	5,500,000	47%	Seco
Stonington	\$1,730,000	1,348,000	2,840,000	47%	Seco
Killingly	\$1,860,304	2,707,000	8,000,000	34%	Seco
Enfield	\$2,089,000	5,333,000	10,000,000	53%	Seco
Westport	\$2,230,493	1,865,000	2,850,000	65%	Denitr
Montville	\$2,329,080	2,357,000	3,400,000	69%	Seco
Farmington	\$2,341,527	3,678,000	5,650,000	65%	Nitrif
Fairfield	\$2,609,883	8,861,000	9,000,000	98%	Seco
Torrington	\$2,733,064	5,331,000	7,000,000	76%	Nitrif
Middletown	\$2,746,781	3,961,000	6,750,000	59%	Seco
Milford	\$2,925,500	7,975,000	11,400,000	70%	Denitr
Norwich	\$3,208,690	3,940,000	8,500,000	46%	Seco
Vernon	\$3,292,906	4,292,000	6,400,000	67%	Nitrif
West Haven	\$3,353,350	7,422,000	12,500,000	59%	Denitr
Groton (Town)	\$3,459,107	3,157,000	5,000,000	63%	Seco
New London	\$3,618,530	7,118,000	10,000,000	71%	Seco
Bristol	\$3,727,090	10,657,000	10,500,000	101%	Nitrif
Stratford	\$3,800,000	8,470,000	11,500,000	74%	Denitr
Mattabassett Dist	\$4,071,670	17,633,000	20,000,000	88%	Seco
Wallingford	\$4,707,547	5,318,000	8,000,000	66%	AWT
Meriden	\$4,720,000	8,951,000	11,600,000	77%	Nitrif
Manchester	\$4,828,074	6,510,000	8,250,000	79%	Nitrif
Naugatuck	\$5,000,000	5,557,000	10,300,000	54%	Nitrif
Greenwich	\$5,800,000	11,307,000	12,000,000	94%	Seco
Danbury	\$7,054,373	9,258,000	15,500,000	60%	Nitrif
Norwalk	\$7,995,772	15,070,000	15,000,000	100%	Denitr
Stamford	\$9,241,000	21,232,000	20,000,000	106%	AWT
Waterbury	\$12,850,403	19,645,000	25,000,000	79%	Seco
New Haven	\$14,970,100	32,717,000	40,000,000	82%	Denitr
Bridgeport	\$22,937,439	30,544,000	41,000,000	74%	Seco
Hartford MDC	\$37,700,000	67,272,000	93,000,000	72%	Seco

Sinking Funds And Fiscal Reserves

During the design life of a wastewater treatment facility, there are a number of major mechanical components which can be expected to wear out and require replacement. For many facilities, the need to make immediate repairs involves overcoming a number of hurdles within municipal government: A reserve/replacement fund, or sinking fund, is a special account out of which major repairs may be accomplished without resorting to requesting emergency funding, or leaving the failed component out of service until the next budget year. Of the 101 facilities which responded to the survey:

- 38 maintain no replacement fund
- 18 allocate 3% of their budget or less
- 16 allocate from 3% to 5%
- 14 allocate from 5% to 10%
- 15 allocate 10% or more of their budget.

Figure 3: Sinking Fund as a Percentage of Budget



When using a sinking fund, a municipality places a certain amount of money aside each year to accommodate costs which are anticipated to occur once every few years. To determine what that amount should be in your town, evaluate the various mechanical components of your facility. Previous experience or the advice of a consultant will give you an estimate of the design life of the major components. Another source of this information is your municipality's **Fixed Asset Inventory**. This document is prepared and updated by an assessor to aid in determining the appropriate level of insurance coverage needed by your municipality. It lists every piece of equipment, furniture, etc. owned by the town, along with its date of purchase, purchase cost, remaining useful life, etc. Once you know how long a piece of equipment is expected to last, you can prepare a cash flow projection which will allow you to have sufficient funds to replace it when the need arises.

TABLE 3
Sinking Funds

Town	Ave Flow 1997	Treatment	1997-98 Budget	Capital Costs	Replacement (Sinking Fund)	Other Costs	% Sinking Fund
Ansonia	2,199,000	Seco	\$835,494	\$0	\$0	\$6,000	0.00%
Avon	670,000	N/A	\$537,789	\$0	\$0	\$0	0.00%
Berlin	not reported	N/A	\$300,000	\$73,500	\$0	\$0	0.00%
Bethel	1,200,000	N/A	\$500,000	\$0	\$0	\$0	0.00%
Branford	3,884,000	Seco	\$1,076,018	\$0	\$0	\$20,000	0.00%
Bridgeport	30,544,000	Seco	\$22,937,439	\$3,989,000	\$0	\$0	0.00%
Burlington	24,000	N/A	\$26,000	\$0	\$0	\$1,000	0.00%
Coventry	59,000	Seco	\$95,030	\$0	\$0	\$0	0.00%
Danbury	9,258,000	Nitrif	\$7,054,373	\$3,800,000	\$0	\$0	0.00%
Enfield	5,333,000	Seco	\$2,089,000	\$0	\$0	\$0	0.00%
Glastonbury	2,029,000	Seco	\$1,100,200	\$0	\$0	\$0	0.00%
Goshen	86,000	AWT	\$466,100	\$0	\$0	\$0	0.00%
Greenwich	11,307,000	Seco	\$5,800,000	\$2,100,000	\$0	\$0	0.00%
Hamden	8,158,000	N/A	\$2,400,000	\$450,850	\$0	\$0	0.00%
Hartford MDC	67,272,000	Seco	\$37,700,000	\$7,100,000	\$0	\$0	0.00%
Jewett City	313,000	Seco	\$372,233	\$22,800	\$0	\$0	0.00%
Kent	84,000	Seco	\$177,140	\$0	\$0	\$0	0.00%
Meriden	8,951,000	Nitrif	\$4,720,000	\$890,000	\$0	\$0	0.00%
Middlebury	800,000	N/A	\$695,000	\$250,000	\$0	\$0	0.00%
Naugatuck	5,557,000	Nitrif	\$5,000,000	\$0	\$0	\$0	0.00%
New Canaan	1,465,000	Seco	\$740,433	\$11,000	\$0	\$0	0.00%
North Branford	675,000	N/A	\$497,261	\$60,000	\$0	\$0	0.00%
Norwalk	15,070,000	Denitr	\$7,995,772	\$2,373,076	\$0	\$0	0.00%
Norwich	3,940,000	Seco	\$3,208,690	\$423,430	\$0	\$0	0.00%
Oxford	44,000	N/A	\$336,279	\$0	\$0	\$47,990	0.00%
Plainfield	1,142,000	Seco	\$650,000	\$0	\$0	\$0	0.00%
Portland	641,000	Seco	\$490,000	\$38,000	\$0	\$0	0.00%
Putnam	1,105,000	Seco	\$787,323	\$0	\$0	\$0	0.00%
Redding	6,000	Denitr	\$60,000	\$0	\$0	\$8,000	0.00%
Somers	39,000	Seco	\$37,000	\$0	\$0	\$0	0.00%
South Windsor	2,151,000	Seco	\$1,238,484	\$628,552	\$0	\$2,554	0.00%
Southbury -	425,000	Seco	\$350,000	\$100,000	\$0	\$0	0.00%
Southington	4,330,000	Nitrif	\$1,406,985	\$0	\$0	\$80,482	0.00%
Sprague	182,000	Seco	\$127,896	\$0	\$0	\$0	0.00%
Thompson	226,000	Seco	\$289,000	\$0	\$0	\$0	0.00%
Wilton	410,000	N/A	\$0	\$0	\$0	\$0	0.00%
Wolcott	750,000	N/A	\$500,000	\$9,000	\$0	\$0	0.00%
Woodbridge	568,000	N/A	\$101,000	\$0	\$0	\$0	0.00%
New Britain	12,600,000	N/A	\$3,476,132	\$0	\$3,000	\$0	0.09%
Derby	1,493,000	Seco	\$1,391,549	\$339,072	\$10,000	\$0	0.95%
East Hampton	1,080,000	Seco	\$509,592	\$0	\$5,000	\$0	0.98%
Litchfield	544,000	Seco	\$523,628	\$100,000	\$5,000	\$0	1.18%
Stafford	1,343,000	Nitrif	\$694,315	\$0	\$9,855	\$0	1.42%
Montville	2,357,000	Seco	\$2,329,080	\$0	\$40,000	\$0	1.72%
Stratford	8,470,000	Denitr	\$3,800,000	\$815,000	\$52,000	\$100,000	1.74%
East Windsor	1,315,000	Seco	\$840,000	\$0	\$15,000	\$0	1.79%
North Canaan	280,000	Seco	\$255,350	\$91,000	\$3,000	\$0	1.83%
Colchester	500,000	N/A	\$543,359	\$0	\$10,000	\$0	1.84%
Canton	487,000	AWT	\$430,822	\$0	\$10,000	\$0	2.32%
Brooklyn	90,000	N/A	\$205,000	\$0	\$5,000	\$0	2.44%
Ridgefield	679,000	Denitr	\$820,000	\$412,250	\$10,000	\$0	2.45%

Sinking Funds, continued

Town	Ave Flow 1997	Treatment	1997-98 Budget	Capital Costs	Replacement (Sinking Fund)	Other Costs	% Sinking Fund
Norfolk	244,000	AWT	\$203,169	\$0	\$5,000	\$0	2.46%
Watertown	831,000	Seco	\$495,750	\$0	\$12,400	\$0	2.50%
Morris	60,000	N/A	\$58,000	\$0	\$1,500	\$0	2.59%
Thomaston	893,000	Seco	\$562,759	\$0	\$15,000	\$0	2.67%
Windham	2,570,000	Seco	\$1,710,135	\$14,000	\$50,000	\$0	2.95%
Torrington	5,331,000	Nitrif	\$2,733,064	\$1,073,225	\$50,000	\$50,000	3.01%
Killingly	2,707,000	Seco	\$1,860,304	\$0	\$56,600	\$0	3.04%
Vernon	4,292,000	Nitrif	\$3,292,906	\$0	\$104,000	\$0	3.16%
Milford	7,975,000	Denitr	\$2,925,500	\$0	\$96,000	\$0	3.28%
Trumbull	3,100,000	N/A	\$3,205,812	\$0	\$110,000	\$0	3.43%
North Haven	3,453,000	Nitrif	\$1,648,841	\$0	\$58,000	\$0	3.52%
Seymour	1,223,000	Denitr	\$700,000	\$0	\$25,000	\$0	3.57%
Harwinton	55,000	N/A	\$39,880	\$0	\$1,500	\$0	3.76%
Cheshire	1,953,000	Nitrif	\$1,249,375	\$200,000	\$40,000	\$0	3.81%
Mattabassett	17,633,000	Seco	\$4,071,670	\$522,700	\$136,700	\$0	3.85%
Sterling	not reported	N/A	\$62,966	\$0	\$2,500	\$0	3.97%
Simsbury	2,291,000	Seco	\$1,000,000	\$0	\$40,000	\$0	4.00%
New London	7,118,000	Seco	\$3,618,530	\$680,755	\$125,000	\$0	4.25%
New Haven	32,717,000	Denitr	\$14,970,100	\$2,500,000	\$600,000	\$0	4.81%
Bristol	10,657,000	Nitrif	\$3,727,090	\$171,000	\$171,260	\$0	4.82%
Stamford	21,232,000	AT	\$9,241,000	\$4,100,000	\$250,000	\$0	4.86%
Shelton	2,263,000	Seco	\$1,307,380	\$0	\$75,000	\$0	5.74%
Stonington	1,348,000	Seco	\$1,730,000	\$0	\$100,000	\$345,600	5.78%
Plymouth	928,000	Denitr	\$700,064	\$0	\$43,700	\$0	6.24%
East Haven	4,000,000	N/A	\$1,790,815	\$0	\$115,000	\$0	6.42%
West Haven	7,422,000	Denitr	\$3,353,350	\$0	\$225,000	\$0	6.71%
Beacon Falls	248,000	Seco	\$186,245	\$0	\$12,500	\$3,000	6.71%
Middletown	3,961,000	Seco	\$2,746,781	\$0	\$200,000	\$0	7.28%
Hebron	120,000	N/A	\$287,000	\$15,000	\$20,000	\$0	7.35%
Darien	2,000,000	N/A	\$1,844,304	\$299,282	\$128,000	\$0	8.28%
Suffield	805,000	Seco	\$1,193,261	\$0	\$100,000	\$0	8.38%
Deep River	84,000	Seco	\$353,091	\$0	\$33,000	\$0	9.35%
Windsor Locks	1,368,000	Seco	\$1,050,150	\$0	\$100,000	\$0	9.52%
East Lyme	700,000	N/A	\$1,049,250	\$0	\$100,000	\$0	9.53%
Salisbury	491,000	Advan	\$255,114	\$0	\$25,000	\$0	9.80%
Fairfield	8,861,000	Seco	\$2,609,883	\$0	\$300,000	\$0	11.49%
Groton (Town)	3,157,000	Seco	\$3,459,107	\$0	\$400,500	\$0	11.58%
Groton (City)	2,073,000	Seco	\$1,400,885	\$0	\$206,250	\$0	14.72%
Ellington	317,000	N/A	\$936,621	\$0	\$139,000	\$0	14.84%
Manchester	6,510,000	Nitrif	\$4,828,074	\$956,305	\$590,500	\$0	15.25%
Ledyard	183,000	Seco	\$325,286	\$0	\$50,000	\$0	15.37%
Waterbury	19,645,000	Seco	\$12,850,403	\$429,735	\$2,000,000	\$0	16.10%
Mansfield	260,000	N/A	\$140,800	\$0	\$23,000	\$0	16.34%
Westport	1,865,000	Denitr	\$2,230,493	\$1,218,189	\$205,000	\$0	20.25%
Waterford	1,600,000	N/A	\$1,632,060	\$0	\$333,940	\$0	20.46%
Wallingford	5,318,000	AT	\$4,707,547	\$2,087,153	\$564,950	\$0	21.56%
Farmington	3,678,000	Nitrif	\$2,341,527	\$121,112	\$485,000	\$0	21.84%
New Milford	517,000	Seco P	\$1,089,679	\$0	\$265,000	\$0	24.32%
Plainville	2,141,000	Nitrif	\$1,661,315	\$379,676	\$320,000	\$0	24.97%
Winchester	1,419,000	Nitrif	\$1,319,404	\$480,454	\$221,689	\$0	26.42%

The size or type of the facility has no apparent relationship to the percentage set aside. Table 3 lists the municipalities in order of increasing sinking funds as a percent of the operation and maintenance budget.

There is serious concern here at DEP that, with the number of aging facilities which we have in the state, needed replacements of critical treatment components are being delayed due to the reluctance to make a significant increase in the municipal wastewater budget. A properly structured replacement fund would alleviate this concern by making a fixed annual payment into a special account set up specifically for these major repairs. In the absence of a detailed life-cycle analysis of the mechanical components of a wastewater collection and treatment facility, a general rule in the literature has been to establish an annual payment of between 5% and 10% of the total operations and maintenance budget to such a fund. DO NOT draw off this account to pay your normal operating expenses. If the fund grows too large, you may need to re-evaluate your replacement schedule or your estimated cost of replacement.

Special Considerations: Surplus & Deficit Management

No matter how good your financial planning is, there may be times when your operating costs will exceed your budget. When this occurs, funds are often transferred from other sources to meet the obligations until the end of the fiscal year. All such transfers must be repaid at the beginning of the next fiscal year (even if the transfer was from another water pollution control account, such as the sinking fund), and the user charges must be increased accordingly to reflect the repayment of these transfers.

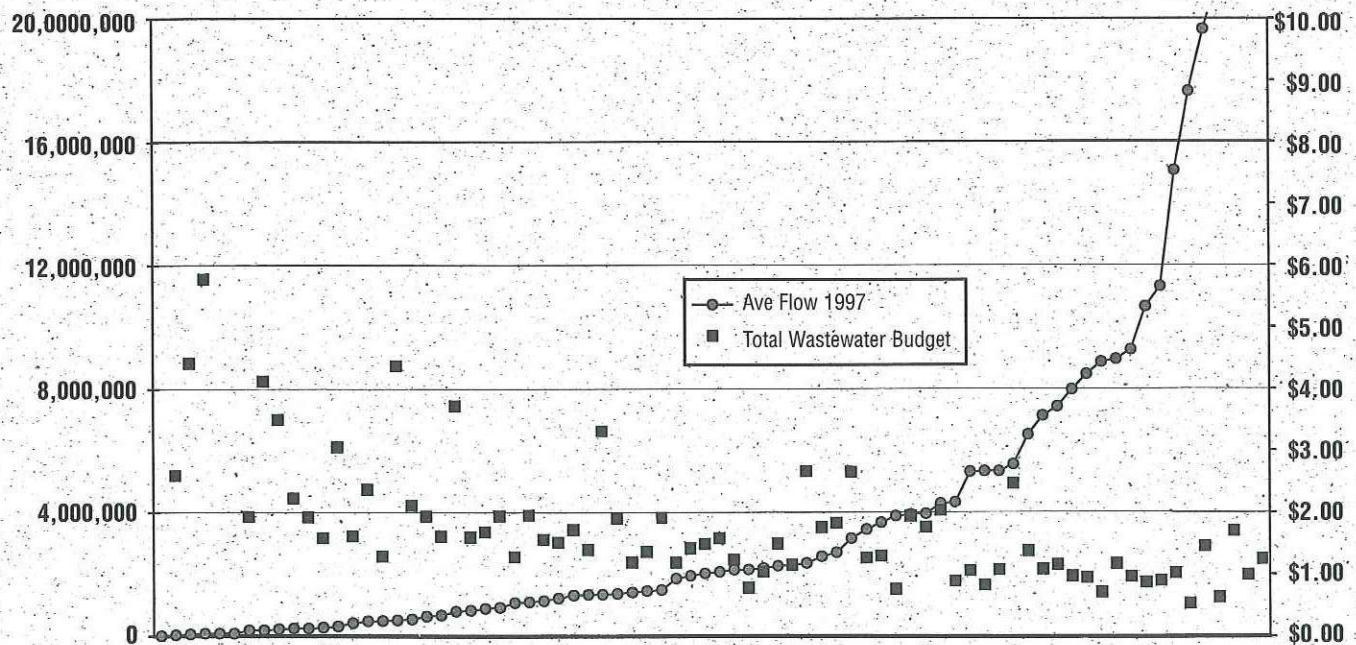
If, by some good fortune, you should have a surplus at the end of the fiscal year, don't launch into a spending spree. Surpluses must be used to defray the following year's costs and, as such, serve to reduce the future user charges or minimize a potential future rate increase. Alternately, your regulations could allow surpluses to be added to the sinking fund reserve, which would also serve to indirectly reduce future user charges.

Under **NO** circumstances should surplus funds originating from the User Charge system be transferred to a municipal general fund or otherwise appropriated. Transfers of this nature are expressly forbidden by Section 7-267 of the Connecticut General Statutes.

Making It Happen: The Cost Of Treating Wastewater

The costs represented in table 4 are derived from the budget numbers and flows in the previous tables. In figure 4, below, you can see that the average cost per thousand gallons to treat wastewater decreases with increasing volumes of flow. Please note that the average cost shown below does not include capital costs or sinking funds, so that a more accurate representation of the cost of treatment can be seen, and the costs at different facilities can be more fairly compared. As demonstrated in previous figures and tables, this graph shows that the larger facilities are capable of providing treatment at a lower cost per 1000 gallons than the smaller facilities. This is due to the fact that the chief cost in the smaller facilities budgets is personnel, which cannot be easily matched to flow as changes occur. Other costs, such as power, chemicals, and replacement parts are geared more directly to the actual flows being treated. Minor variations in personnel at larger facilities do not greatly alter the total cost of operating the facility, where at a smaller facility, the addition of a single person may change the total budget by 20% to 40% without a corresponding increase in flows or revenues.

Figure 4: The Cost of Treating Wastewater



Please recognize that the numbers shown are for the cost of treating *all* of the flow which reaches the treatment facility, including infiltration and inflow. Unless a sewer system has no extraneous flows, it will *not* be possible to calculate a property's user charge based solely on the data from table 4.

TABLE 4
The Cost of Treating Wastewater

Town	Design Flow	Ave Flow 1997	Treatment	1997-98 Budget	Capital Costs	Replacement	Cost / 1000 gal	Residential Bill	Residential Units	Residential Billing Method
Mattabassett	20,000,000	17,633,000	Seco	\$4,071,670	\$522,700	\$136,700	\$0.53	\$0.00	0	N/A
Stamford	20,000,000	21,232,000	AT	\$9,241,000	\$4,100,000	\$250,000	\$0.63	\$147.70	26,000	Flow
Fairfield	9,000,000	8,861,000	Seco	\$2,609,883	\$0	\$300,000	\$0.71	\$146.00	15,000	Flow
Branford	4,500,000	3,884,000	Seco	\$1,076,018	\$0	\$0	\$0.76	\$0.00	9,500	Ad Val
South Windsor	3,750,000	2,151,000	Seco	\$1,238,484	\$628,552	\$0	\$0.78	\$195.00	6,935	Unit
Torrington	7,000,000	5,331,000	Nitrif	\$2,733,064	\$1,073,225	\$50,000	\$0.83	\$147.00	13,320	Unit
Bristol	10,500,000	10,657,000	Nitrif	\$3,727,090	\$171,000	\$171,260	\$0.87	\$152.00	15,500	Flow
Southington	7,400,000	4,330,000	Nitrif	\$1,406,985	\$0	\$0	\$0.89	\$159.00	8,500	Flow
Greenwich	12,000,000	11,307,000	Seco	\$5,800,000	\$2,100,000	\$0	\$0.90	\$350.00	16,000	Ad Val
Stratford	11,500,000	8,470,000	Denitr	\$3,800,000	\$815,000	\$52,000	\$0.95	\$147.25	20,000	Unit
Danbury	15,500,000	9,258,000	Nitrif	\$7,054,373	\$3,800,000	\$0	\$0.96	\$80.00	10,000	Flow
Milford	11,400,000	7,975,000	Denitr	\$2,925,500	\$0	\$96,000	\$0.97	\$143.00	20,000	Unit
New Haven	40,000,000	32,717,000	Denitr	\$14,970,100	\$2,500,000	\$600,000	\$0.99	\$157.00	23,000	Flow
Norwalk	15,000,000	15,070,000	Denitr	\$7,995,772	\$2,373,076	\$0	\$1.02	\$0.00	20,966	Ad Val
Ansonia	3,500,000	2,199,000	Seco	\$835,494	\$0	\$0	\$1.04	\$98.26	7,500	Flow
Wallingford	8,000,000	5,318,000	AT	\$4,707,547	\$2,087,153	\$564,950	\$1.06	\$296.00	12,000	Flow
Enfield	10,000,000	5,333,000	Seco	\$2,089,000	\$0	\$0	\$1.07	\$0.00	18,800	Ad Val
New London	10,000,000	7,118,000	Seco	\$3,618,530	\$680,755	\$125,000	\$1.08	\$243.50	12,000	Flow
Simsbury	2,850,000	2,291,000	Seco	\$1,000,000	\$0	\$40,000	\$1.15	\$100.00	5,000	Unit
West Haven	12,500,000	7,422,000	Denitr	\$3,353,350	\$0	\$225,000	\$1.15	\$134.00	27,500	Unit
Meriden	11,600,000	8,951,000	Nitrif	\$4,720,000	\$890,000	\$0	\$1.17	\$162.00	15,365	Flow
Westport	2,850,000	1,865,000	Denitr	\$2,230,493	\$1,218,189	\$205,000	\$1.19	\$189.00	2,700	Unit
Winchester	3,500,000	1,419,000	Nitrif	\$1,319,404	\$480,454	\$221,689	\$1.19	\$467.00	2,788	Unit or Flow
Plainville	3,800,000	2,141,000	Nitrif	\$1,661,315	\$379,676	\$320,000	\$1.23	\$225.00	5,336	Flow
Hartford MDC	93,000,000	67,272,000	Seco	\$37,700,000	\$7,100,000	\$0	\$1.25	\$0.00	104,000	Ad Val
North Haven	4,570,000	3,453,000	Nitrif	\$1,648,841	\$0	\$58,000	\$1.26	\$142.00	6,000	Unit or Flow
East Hampton	3,900,000	1,080,000	Seco	\$509,592	\$0	\$5,000	\$1.28	\$165.00	2,000	Unit
Salisbury	670,000	491,000	Advan	\$255,114	\$0	\$25,000	\$1.28	\$159.60	560	Unit + Flow
Farmington	5,650,000	3,678,000	Nitrif	\$2,341,527	\$121,112	\$485,000	\$1.29	\$141.00	6,800	Unit
New Canaan	1,500,000	1,465,000	Seco	\$740,433	\$11,000	\$0	\$1.36	\$0.00	3,000	Ad Val
Manchester	8,250,000	6,510,000	Nitrif	\$4,828,074	\$956,305	\$590,500	\$1.38	\$211.00	20,000	Flow, Ad Val
Stafford	2,000,000	1,343,000	Nitrif	\$694,315	\$0	\$9,855	\$1.40	\$186.00	1,923	Unit
Cheshire	3,500,000	1,953,000	Nitrif	\$1,249,375	\$200,000	\$40,000	\$1.42	\$185.00	4,000	Unit
Waterbury	25,000,000	19,645,000	Seco	\$12,850,403	\$429,735	\$2,000,000	\$1.45	\$180.00	23,500	Flow
Glastonbury	3,640,000	2,029,000	Seco	\$1,100,200	\$0	\$0	\$1.49	\$168.00	4,676	Flow
Shelton	2,575,000	2,263,000	Seco	\$1,307,380	\$0	\$75,000	\$1.49	\$120.00	9,000	Unit
Seymour	2,930,000	1,223,000	Denitr	\$700,000	\$0	\$25,000	\$1.51	\$120.00	3,000	Flow
Plainfield	1,787,000	1,142,000	Seco	\$650,000	\$0	\$0	\$1.56	\$130.00	4,742	Unit
North Canaan	340,000	280,000	Seco	\$255,350	\$91,000	\$3,000	\$1.58	\$215.00	650	Unit
Groton (City)	3,100,000	2,073,000	Seco	\$1,400,885	\$0	\$206,250	\$1.58	\$0.00	3,500	Ad Val

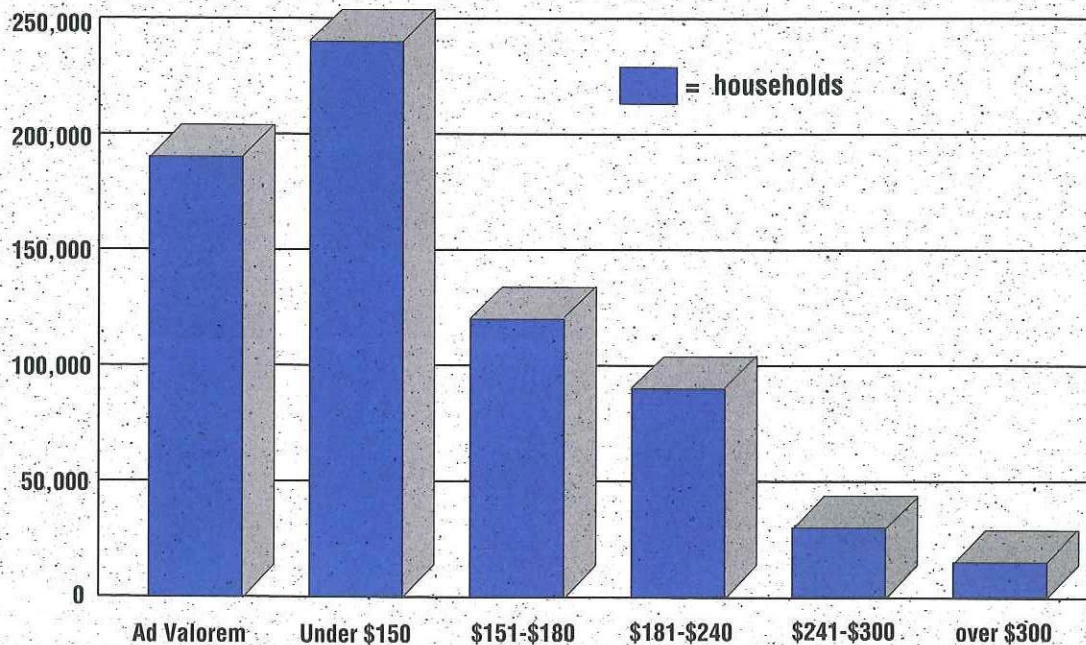
The Cost of Treating Wastewater, *continued*

Town	Design Flow	Ave Flow 1997	Treatment	1997-98 Budget	Capital Costs	Replacement	Cost / 1000 gal	Residential Bill	Residential Units	Residential Billing Method
Watertown	1,000,000	831,000	Seco	\$495,750	\$0	\$12,400	\$1.59	\$0.00	2,050	Ad Val
Ridgefield	870,000	679,000	Denitr	\$820,000	\$412,250	\$10,000	\$1.60	\$290.00	1,648	Unit
Southbury	780,000	425,000	Seco	\$350,000	\$100,000	\$0	\$1.61	\$282.00	2,840	Unit & Flow
Thomaston	1,200,000	893,000	Seco	\$562,759	\$0	\$15,000	\$1.68	\$185.00	2,313	Unit
Bridgeport	41,000,000	30,544,000	Seco	\$22,937,439	\$3,989,000	\$0	\$1.70	\$220.00	28,000	Flow
East Windsor	2,500,000	1,315,000	Seco	\$840,000	\$0	\$15,000	\$1.72	\$144.00	1,440	Unit
Windham	5,500,000	2,570,000	Seco	\$1,710,135	\$14,000	\$50,000	\$1.75	\$168.48	4,500	Flow
Middletown	6,750,000	3,961,000	Seco	\$2,746,781	\$0	\$200,000	\$1.76	\$127.40	7,200	Flow
Killingly	8,000,000	2,707,000	Seco	\$1,860,304	\$0	\$56,600	\$1.83	\$165.00	3,458	Unit
Windsor Locks	2,120,000	1,368,000	Seco	\$1,050,150	\$0	\$100,000	\$1.90	\$136.00	4,900	Flow
Derby	3,030,000	1,493,000	Seco	\$1,391,549	\$339,072	\$10,000	\$1.91	\$157.53	4,299	Unit + Flow
Beacon Falls	500,000	248,000	Seco	\$186,245	\$0	\$12,500	\$1.92	\$0.00	1,200	Ad Val
Sprague	400,000	182,000	Seco	\$127,896	\$0	\$0	\$1.93	\$222.00	512	Unit
Portland	1,000,000	641,000	Seco	\$490,000	\$38,000	\$0	\$1.93	\$220.00	1,150	Flow
Norwich	8,500,000	3,940,000	Seco	\$3,208,690	\$423,430	\$0	\$1.94	\$225.00	9,000	Flow
Plymouth	1,750,000	928,000	Denitr	\$700,064	\$0	\$43,700	\$1.94	\$150.00	3,953	Unit
Putnam	2,910,000	1,105,000	Seco	\$787,323	\$0	\$0	\$1.95	\$143.44	2,600	Unit
Vernon	6,400,000	4,292,000	Nitrif	\$3,292,906	\$0	\$104,000	\$2.04	\$150.00	13,808	Flow
Litchfield	770,000	544,000	Seco	\$523,628	\$100,000	\$5,000	\$2.11	\$220.00	2,010	Unit
Norfolk	350,000	244,000	AWT	\$203,169	\$0	\$5,000	\$2.23	\$498.20	377	Unit + Flow
Canton	800,000	487,000	AWT	\$430,822	\$0	\$10,000	\$2.37	\$195.00	1,400	Unit + Flow
Naugatuck	10,300,000	5,557,000	Nitrif	\$5,000,000	\$0	\$0	\$2.47	\$0.00	7,787	
Somers	65,000	39,000	Seco	\$37,000	\$0	\$0	\$2.60	\$135.00	260	Unit
Groton (Town)	5,000,000	3,157,000	Seco	\$3,459,107	\$0	\$400,500	\$2.65	\$156.00	9,600	Unit
Montville	3,400,000	2,357,000	Seco	\$2,329,080	\$0	\$40,000	\$2.66	\$232.00	3,900	Unit
Jewett City	500,000	313,000	Seco	\$372,233	\$22,800	\$0	\$3.06	\$290.46	750	Flow
Stonington	2,840,000	1,348,000	Seco	\$1,730,000	\$0	\$100,000	\$3.31	\$190.00	3,800	Flow
Thompson	1,359,000	226,000	Seco	\$289,000	\$0	\$0	\$3.50	\$197.10	529	Unit
Suffield	1,500,000	805,000	Seco	\$1,193,261	\$0	\$100,000	\$3.72	\$195.00	2,462	Unit
Ledyard	240,000	183,000	Seco	\$325,286	\$0	\$50,000	\$4.12	\$396.00	750	Flow
New Milford	1,000,000	517,000	Seco P	\$1,089,679	\$0	\$265,000	\$4.37	\$347.30	2,202	Unit + Flow
Coventry	200,000	59,000	Seco	\$95,030	\$0	\$0	\$4.41	\$225.00	265	Unit
Kent	140,000	84,000	Seco	\$177,140	\$0	\$0	\$5.78	\$220.00	260	Unit or Flow
Deep River	165,000	84,000	Seco	\$353,091	\$0	\$33,000	\$10.44	\$330.00	630	Unit
Goshen	80,000	86,000	AWT	\$466,100	\$0	\$0	\$14.85	\$772.00	468	Ad Val
Redding	17,000	6,000	Denitr	\$60,000	\$0	\$0	\$27.40	\$1,120.00	10	Flow

Paying For The Result: The Cost To The Consumer

The user charge of greatest concern to most people is the annual charge to the typical residence for wastewater treatment services. It should represent the actual cost of services provided to the property owner. Some communities also recover their capital costs through the User Charge billing system; these costs have not been separated from the values shown in table 5. Note that if capital costs are recovered in this manner, rather than by benefit assessment, the portion of the total bill attributable to capital recovery must be clearly indicated on the bill, either as a separate line item or as a statement of percentage of total billing.

Figure 5: Range of Annual User Charges in Connecticut



Eleven municipal systems still utilize an Ad Valorem system; that is, all costs of wastewater treatment are recovered through general taxation. In general, this situation occurs in larger municipalities where a significant portion of the total population is served by sewers. The rest of the municipalities rely on separate bills to the customer which generally reflect their proportional share of the total cost of operation and maintenance of the wastewater collection and treatment system.

The existence of a viable, self-sustaining User Charge system has been a major program requirement for municipalities receiving Federal or State funding assistance on water pollution control projects. In general, both DEP and USEPA have discouraged the creation of new Ad Valorem systems, and have carefully examined those few that have been approved. Over the past two decades, most municipalities in Connecticut have chosen to adopt or change to an independent User Charge system.

TABLE 5
The Cost to the Consumer

Town	Ave Flow 1997	Treatment	Residential Bill	Residential Billing Method	Residential Units
Naugatuck	5,557,000	Nitrif	\$0.00	N/A, see note	7,787
Danbury	9,258,000	Nitrif	\$80.00	Flow	10,000
Wolcott	750,000	N/A	\$90.00	Unit	2,200
Ansonia	2,199,000	Seco	\$98.26	Flow	7,500
New Britain	12,600,000	N/A	\$100.00	Flow	17,000
Middlebury	800,000	N/A	\$100.00	Unit	1,200
Simsbury	2,291,000	Seco	\$100.00	Unit	5,000
Seymour	1,223,000	Denitr	\$120.00	Flow	3,000
Shelton	2,263,000	Seco	\$120.00	Unit	9,000
Middletown	3,961,000	Seco	\$127.40	Flow	7,200
East Haven	4,000,000	N/A	\$130.00	Unit	9,000
Plainfield	1,142,000	Seco	\$130.00	Unit	4,742
West Haven	7,422,000	Denitr	\$134.00	Unit	27,500
Somers	39,000	Seco	\$135.00	Unit	260
Windsor Locks	1,368,000	Seco	\$136.00	Flow	4,900
Farmington	3,678,000	Nitrif	\$141.00	Unit	6,800
North Haven	3,453,000	Nitrif	\$142.00	Unit or Flow	6,000
Milford	7,975,000	Denitr	\$143.00	Unit	20,000
Putnam	1,105,000	Seco	\$143.44	Unit	2,600
East Windsor	1,315,000	Seco	\$144.00	Unit	1,440
Wilton	410,000	N/A	\$145.00	Unit	1,600
Fairfield	8,861,000	Seco	\$146.00	Flow	15,000
Torrington	5,331,000	Nitrif	\$147.00	Unit	13,320
Stratford	8,470,000	Denitr	\$147.25	Unit	20,000
Stamford	21,232,000	AWT	\$147.70	Flow	26,000
Berlin	not reported	N/A	\$148.00	Flow	1,361
Vernon	4,292,000	Nitrif	\$150.00	Flow	13,808
Woodbridge	568,000	N/A	\$150.00	Flow	300
Plymouth	928,000	Denitr	\$150.00	Unit	3,953
Bristol	10,657,000	Nitrif	\$152.00	Flow	15,500
Groton (Town)	3,157,000	Seco	\$156.00	Unit	9,600
New Haven	32,717,000	Denitr	\$157.00	Flow	23,000
Derby	1,493,000	Seco	\$157.53	Unit + Flow	4,299
Southington	4,330,000	Nitrif	\$159.00	Flow	8,500
Salisbury	491,000	AWT	\$159.60	Unit + Flow	560
Mansfield	260,000	N/A	\$160.00	Flow	500
Avon	670,000	N/A	\$160.00	Unit	2,300
Harwinton	55,000	N/A	\$160.00	Unit	200
Meriden	8,951,000	Nitrif	\$162.00	Flow	15,365
Oxford	44,000	N/A	\$164.00	Flow	41
North Branford	675,000	N/A	\$164.00	Unit	1,900
East Hampton	1,080,000	Seco	\$165.00	Unit	2,000
Killingly	2,707,000	Seco	\$165.00	Unit	3,458
Glastonbury	2,029,000	Seco	\$168.00	Flow	4,676
Windham	2,570,000	Seco	\$168.48	Flow	4,500
Brooklyn	90,000	N/A	\$172.00	Unit	400
Waterbury	19,645,000	Seco	\$180.00	Flow	23,500
Waterford	1,600,000	N/A	\$180.00	Unit	5,610
Cheshire	1,953,000	Nitrif	\$185.00	Unit	4,000

The Cost to the Consumer, continued

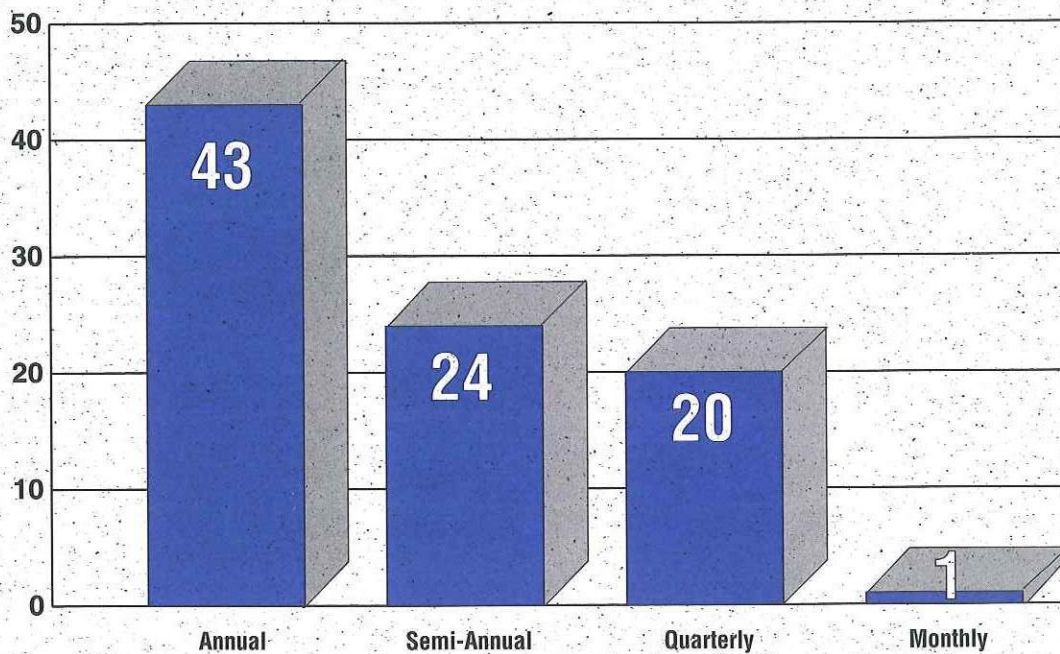
Town	Ave Flow 1997	Treatment	Residential Bill	Residential Billing Method	Residential Units
Thomaston	893,000	Seco	\$185.00	Unit	2,313
Stafford	1,343,000	Nitrif	\$186.00	Unit	1,923
Westport	1,865,000	Denitr	\$189.00	Unit	2,700
Stonington	1,348,000	Seco	\$190.00	Flow	3,800
Morris	60,000	N/A	\$190.00	Unit	230
South Windsor	2,151,000	Seco	\$195.00	Unit	6,935
Suffield	805,000	Seco	\$195.00	Unit	2,462
Canton	487,000	AWT	\$195.00	Unit + Flow	1,400
Thompson	226,000	Seco	\$197.10	Unit	529
Manchester	6,510,000	Nitrif	\$211.00	Flow, Ad Val	20,000
North Canaan	280,000	Seco	\$215.00	Unit	650
Colchester	500,000	N/A	\$218.00	Flow	1,260
Bridgeport	30,544,000	Seco	\$220.00	Flow	28,000
Portland	641,000	Seco	\$220.00	Flow	1,150
Litchfield	544,000	Seco	\$220.00	Unit	2,010
Kent	84,000	Seco	\$220.00	Unit or Flow	260
Sprague	182,000	Seco	\$222.00	Unit	512
Norwich	3,940,000	Seco	\$225.00	Flow	9,000
Plainville	2,141,000	Nitrif	\$225.00	Flow	5,336
Coventry	59,000	Seco	\$225.00	Unit	265
Montville	2,357,000	Seco	\$232.00	Unit	3,900
New London	7,118,000	Seco	\$243.50	Flow	12,000
Burlington	24,000	N/A	\$264.00	Unit	100
East Lyme	700,000	N/A	\$280.00	Flow	2,250
Southbury -	425,000	Seco	\$282.00	Unit + Flow	2,840
Ridgefield	679,000	Denitr	\$290.00	Unit	1,648
Jewett City	313,000	Seco	\$290.46	Flow	750
Trumbull	3,100,000	N/A	\$292.00	Unit	6,000
Wallingford	5,318,000	AWT	\$296.00	Flow	12,000
Hebron	120,000	N/A	\$300.00	Unit or Flow	700
Deep River	84,000	Seco	\$330.00	Unit	630
New Milford	517,000	Seco P	\$347.30	Unit + Flow	2,202
Darien	2,000,000	N/A	\$350.00	Flow	4,414
Sterling	not reported	N/A	\$350.00	Unit	153
Ellington	317,000	N/A	\$350.00	Unit or Flow	1,908
Bethel	1,200,000	N/A	\$360.00	Flow	3,000
Ledyard	183,000	Seco	\$396.00	Flow	750
Winchester	1,419,000	Nitrif	\$467.00	Unit or Flow	2,788
Norfolk	244,000	AWT	\$498.20	Unit + Flow	377
Redding	6,000	Denitr	\$1,120.00	Flow	10

NOTE: Because all its costs are offset by income from the sludge handling process, Naugatuck currently does not charge its users for sewer service

Getting The Money (Part I): How Often To Bill

How often should a bill be sent out to your customers? The frequency with which bills are sent is not as simple as it might first appear: Each time a different billing is generated, additional printing, mailing, and accounting costs are incurred. On the other hand, spreading out the billings may make it easier for the average household or business to make the proper payment, in full and on time. In general, slightly less than half of all Connecticut municipalities bill once per year, as shown graphically below in figure 6. The number of municipalities using each method are shown on the appropriate section of the figure.

Figure 6: Municipal Billing Frequency for User Charges



Note that municipalities using Ad Valorem systems are not reflected in figure 6. The municipalities are also listed in Table 6 in order of increasing frequency of billing.

TABLE 6
Billing Frequency

Town	Ave Flow 1997	Residential Billing Method	Residential Bill	Billing Frequency	Collection Rate
Ansonia	2,199,000	Flow	\$98.26	Annual	93.00%
Avon	670,000	Unit	\$160.00	Annual	98.80%
Brooklyn	90,000	Unit	\$172.00	Annual	88.00%
Burlington	24,000	Unit	\$264.00	Annual	90.00%
Canton	487,000	Unit + Flow	\$195.00	Annual	80.00%
Cheshire	1,953,000	Unit	\$185.00	Annual	95.30%
Darien	2,000,000	Flow	\$350.00	Annual	98.00%
Derby	1,493,000	Unit + Flow	\$157.53	Annual	92.00%
East Hampton	1,080,000	Unit	\$165.00	Annual	92.00%
East Haven	4,000,000	Unit	\$130.00	Annual	95.00%
Farmington	3,678,000	Unit	\$141.00	Annual	98.90%
Glastonbury	2,029,000	Flow	\$168.00	Annual	96.00%
Groton (Town)	3,157,000	Unit	\$156.00	Annual	97.00%
Harwinton	55,000	Unit	\$160.00	Annual	98.00%
Killingly	2,707,000	Unit	\$165.00	Annual	98.80%
Litchfield	544,000	Unit	\$220.00	Annual	91.00%
Middlebury	800,000	Unit	\$100.00	Annual	95.00%
Milford	7,975,000	Unit	\$143.00	Annual	90.00%
Morris	60,000	Unit	\$190.00	Annual	95.00%
New Milford	517,000	Unit + Flow	\$347.30	Annual	80.00%
Norfolk	244,000	Unit + Flow	\$498.20	Annual	95.00%
North Branford	675,000	Unit	\$164.00	Annual	93.00%
North Canaan	280,000	Unit	\$215.00	Annual	98.00%
North Haven	3,453,000	Unit or Flow	\$142.00	Annual	95.00%
Plainville	2,141,000	Flow	\$225.00	Annual	94.70%
Plymouth	928,000	Unit	\$150.00	Annual	92.00%
Ridgefield	679,000	Unit	\$290.00	Annual	96.40%
Salisbury	491,000	Unit + Flow	\$159.60	Annual	90.00%
Shelton	2,263,000	Unit	\$120.00	Annual	97.00%
Simsbury	2,291,000	Unit	\$100.00	Annual	97.00%
Somers	39,000	Unit	\$135.00	Annual	88.00%
South Windsor	2,151,000	Unit	\$195.00	Annual	97.50%
Southington	4,330,000	Flow	\$159.00	Annual	96.50%
Stafford	1,343,000	Unit	\$186.00	Annual	96.00%
Sterling	not reported	Unit	\$350.00	Annual	85.00%
Suffield	805,000	Unit	\$195.00	Annual	96.65%
Thomaston	893,000	Unit	\$185.00	Annual	98.00%
Thompson	226,000	Unit	\$197.10	Annual	85.00%
Westport	1,865,000	Unit	\$189.00	Annual	95.00%
Wilton	410,000	Unit	\$145.00	Annual	99.00%
Windsor Locks	1,368,000	Flow	\$136.00	Annual	96.50%
Wolcott	750,000	Unit	\$90.00	Annual	93.00%
Woodbridge	568,000	Flow	\$150.00	Annual	95.00%
Berlin	not reported	Flow	\$148.00	Semi	100.00%
Coventry	59,000	Unit	\$225.00	Semi	64.00%
Deep River	84,000	Unit	\$330.00	Semi	96.00%
East Lyme	700,000	Flow	\$280.00	Semi	100.00%
East Windsor	1,315,000	Unit	\$144.00	Semi	97.00%
Ellington	317,000	Unit or Flow	\$350.00	Semi	95.80%

Billing Frequency, continued

Town	Ave Flow 1997	Residential Billing Method	Residential Bill	Billing Frequency	Collection Rate
Fairfield	8,861,000	Flow	\$146.00	Semi	97.00%
Hebron	120,000	Unit or Flow	\$300.00	Semi	95.00%
Mansfield	260,000	Flow	\$160.00	Semi	99.00%
Meriden	8,951,000	Flow	\$162.00	Semi	72.00%
Middletown	3,961,000	Flow	\$127.40	Semi	99.00%
New Britain	12,600,000	Flow	\$100.00	Semi	96.00%
New London	7,118,000	Flow	\$243.50	Semi	104.00%
Oxford	44,000	Flow	\$164.00	Semi	98.00%
Plainfield	1,142,000	Unit	\$130.00	Semi	98.00%
Portland	641,000	Flow	\$220.00	Semi	96.00%
Seymour	1,223,000	Flow	\$120.00	Semi	75.00%
Stamford	21,232,000	Flow	\$147.70	Semi	0.00%
Stonington	1,348,000	Flow	\$190.00	Semi	92.50%
Stratford	8,470,000	Unit	\$147.25	Semi	95.00%
Torrington	5,331,000	Unit	\$147.00	Semi	100.00%
Waterford	1,600,000	Unit	\$180.00	Semi	95.00%
West Haven	7,422,000	Unit	\$134.00	Semi	92.00%
Winchester	1,419,000	Unit or Flow	\$467.00	Semi	94.00%
Bethel	1,200,000	Flow	\$360.00	Quarterly	0.00%
Bridgeport	30,544,000	Flow	\$220.00	Quarterly	87.00%
Bristol	10,657,000	Flow	\$152.00	Quarterly	98.00%
Colchester	500,000	Flow	\$218.00	Quarterly	98.00%
Danbury	9,258,000	Flow	\$80.00	Quarterly	95.00%
Jewett City	313,000	Flow	\$290.46	Quarterly	90.00%
Kent	84,000	Unit or Flow	\$220.00	Quarterly	96.00%
Ledyard	183,000	Flow	\$396.00	Quarterly	86.00%
Manchester	6,510,000	Flow, Ad Val	\$211.00	Quarterly	96.00%
Montville	2,357,000	Unit	\$232.00	Quarterly	0.00%
New Haven	32,717,000	Flow	\$157.00	Quarterly	87.00%
Putnam	1,105,000	Unit	\$143.44	Quarterly	88.00%
Redding	6,000	Flow	\$1,120.00	Quarterly	0.00%
Southbury -	425,000	Unit + Flow	\$282.00	Quarterly	99.50%
Sprague	182,000	Unit	\$222.00	Quarterly	94.00%
Trumbull	3,100,000	Unit	\$292.00	Quarterly	85.00%
Vernon	4,292,000	Flow	\$150.00	Quarterly	90.00%
Wallingford	5,318,000	Flow	\$296.00	Quarterly	96.00%
Waterbury	19,645,000	Flow	\$180.00	Quarterly	84.00%
Windham	2,570,000	Flow	\$168.48	Quarterly	0.00%
Norwich	3,940,000	Flow	\$225.00	Monthly	98.00%

Getting The Money (Part II): Collecting What You Bill

Simply setting up a budget and sending out bills is only part of the job...if you don't collect a reasonable percentage of what you've billed out, you'll always wind up short of funds at the end of the year. On top of that, you'll have done a disservice to all those customers who paid their bills on time.

Remember, in order to account for delinquent bills and avoid a shortfall in your cashflow, increase your bills by a factor equal to the anticipated delinquency rate.

From the survey data and the figure below, it can be seen that there has been significant improvement in this category since the last survey. Of the 85 communities reporting, 21 indicate collection rates of 98% or more, and another 32 indicate rates of between 95% and 98%. Unfortunately, there are still a number of communities whose collection rates are significantly less than what we would hope to see.

Many municipalities accept non-payment of bills as a necessary evil, without realizing that alternatives exist. Section 7-258 of the Connecticut General Statutes allows municipalities to lien properties whose owners are delinquent in paying their user charges. In many cases, making the users realize that the user charge is a real bill with definite enforcement power behind it is all that is necessary to get a better percentage of bills being paid. Other communities have actually hired collection agencies who, for a fee, guarantee the town a fixed return on the billed amounts.

As before, the municipalities utilizing an Ad Valorem system have been excluded from figure 7, below, and from table 7 on the following pages.

Figure 7: Percentage of Billings Collected within 12 Months

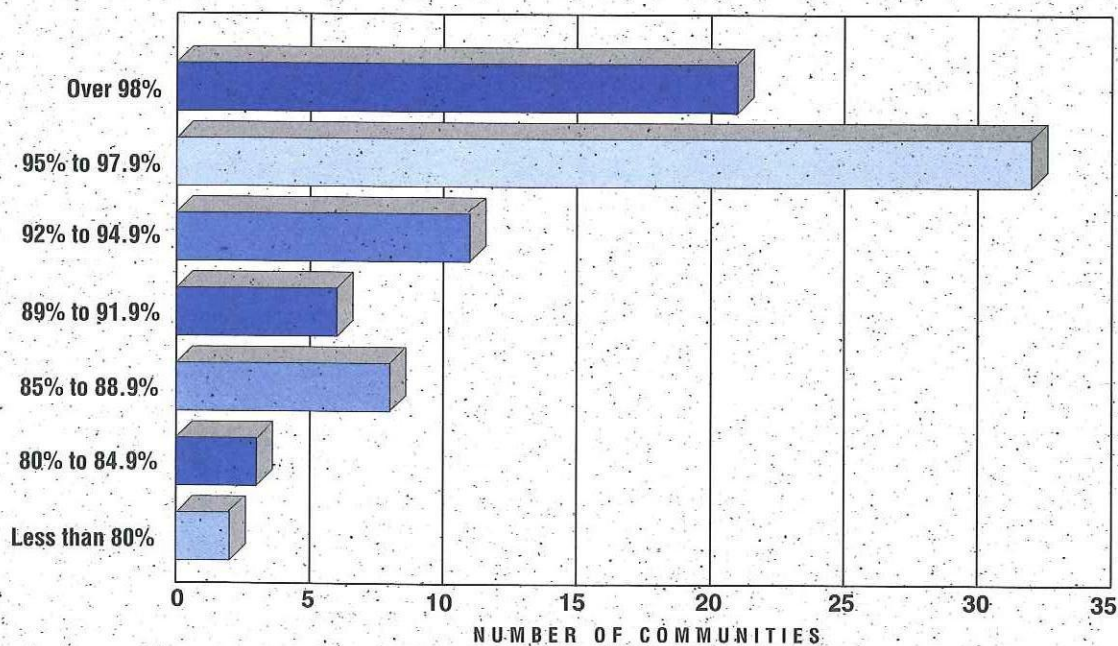


TABLE 7
Collecting What You Bill

Town	Ave Flow 1997	Residential Billing Method	Collection Rate	Billing Frequency	Residential Bill
New London	7,118,000	Flow	104.00%	Semi	\$243.50
Torrington	5,331,000	Unit	100.00%	Semi	\$147.00
Berlin	not reported	Flow	100.00%	Semi	\$148.00
East Lyme	700,000	Flow	100.00%	Semi	\$280.00
Southbury	425,000	Unit + Flow	99.50%	Quarterly	\$282.00
Wilton	410,000	Unit	99.00%	Annual	\$145.00
Mansfield	260,000	Flow	99.00%	Semi	\$160.00
Middletown	3,961,000	Flow	99.00%	Semi	\$127.40
Farmington	3,678,000	Unit	98.90%	Annual	\$141.00
Avon	670,000	Unit	98.80%	Annual	\$160.00
Killingly	2,707,000	Unit	98.80%	Annual	\$165.00
Harwinton	55,000	Unit	98.00%	Annual	\$160.00
North Canaan	280,000	Unit	98.00%	Annual	\$215.00
Plainfield	1,142,000	Unit	98.00%	Semi	\$130.00
Thomaston	893,000	Unit	98.00%	Annual	\$185.00
Bristol	10,657,000	Flow	98.00%	Quarterly	\$152.00
Colchester	500,000	Flow	98.00%	Quarterly	\$218.00
Darien	2,000,000	Flow	98.00%	Annual	\$350.00
Norwich	3,940,000	Flow	98.00%	Monthly	\$225.00
Oxford	44,000	Flow	98.00%	Semi	\$164.00
South Windsor	2,151,000	Unit	97.50%	Annual	\$195.00
East Windsor	1,315,000	Unit	97.00%	Semi	\$144.00
Groton (Town)	3,157,000	Unit	97.00%	Annual	\$156.00
Shelton	2,263,000	Unit	97.00%	Annual	\$120.00
Simsbury	2,291,000	Unit	97.00%	Annual	\$100.00
Fairfield	8,861,000	Flow	97.00%	Semi	\$146.00
Suffield	805,000	Unit	96.65%	Annual	\$195.00
Southington	4,330,000	Flow	96.50%	Annual	\$159.00
Windsor Locks	1,368,000	Flow	96.50%	Annual	\$136.00
Ridgefield	679,000	Unit	96.40%	Annual	\$290.00
Kent	84,000	Unit or Flow	96.00%	Quarterly	\$220.00
Deep River	84,000	Unit	96.00%	Semi	\$330.00
Stafford	1,343,000	Unit	96.00%	Annual	\$186.00
Manchester	6,510,000	Flow, Ad Val	96.00%	Quarterly	\$211.00
Glastonbury	2,029,000	Flow	96.00%	Annual	\$168.00
New Britain	12,600,000	Flow	96.00%	Semi	\$100.00
Portland	641,000	Flow	96.00%	Semi	\$220.00
Wallingford	5,318,000	Flow	96.00%	Quarterly	\$296.00
Ellington	317,000	Unit or Flow	95.80%	Semi	\$350.00
Cheshire	1,953,000	Unit	95.30%	Annual	\$185.00
Hebron	120,000	Unit or Flow	95.00%	Semi	\$300.00
North Haven	3,453,000	Unit or Flow	95.00%	Annual	\$142.00
Norfolk	244,000	Unit + Flow	95.00%	Annual	\$498.20
East Haven	4,000,000	Unit	95.00%	Annual	\$130.00
Middlebury	800,000	Unit	95.00%	Annual	\$100.00

Collecting What You Bill, continued

Town	Ave Flow 1997	Residential Billing Method	Collection Rate	Billing Frequency	Residential Bill
Montville	2,357,000	Unit	95.00%	Quarterly	\$232.00
Morris	60,000	Unit	95.00%	Annual	\$190.00
Stratford	8,470,000	Unit	95.00%	Semi	\$147.25
Waterford	1,600,000	Unit	95.00%	Semi	\$180.00
Westport	1,865,000	Unit	95.00%	Annual	\$189.00
Danbury	9,258,000	Flow	95.00%	Quarterly	\$80.00
Woodbridge	568,000	Flow	95.00%	Annual	\$150.00
Plainville	2,141,000	Flow	94.70%	Annual	\$225.00
Winchester	1,419,000	Unit or Flow	94.00%	Semi	\$467.00
Sprague	182,000	Unit	94.00%	Quarterly	\$222.00
North Branford	675,000	Unit	93.00%	Annual	\$164.00
Wolcott	750,000	Unit	93.00%	Annual	\$90.00
Ansonia	2,199,000	Flow	93.00%	Annual	\$98.26
Stonington	1,348,000	Flow	92.50%	Semi	\$190.00
Derby	1,493,000	Unit + Flow	92.00%	Annual	\$157.53
East Hampton	1,080,000	Unit	92.00%	Annual	\$165.00
Plymouth	928,000	Unit	92.00%	Annual	\$150.00
West Haven	7,422,000	Unit	92.00%	Semi	\$134.00
Litchfield	544,000	Unit	91.00%	Annual	\$220.00
Salisbury	491,000	Unit + Flow	90.00%	Annual	\$159.60
Burlington	24,000	Unit	90.00%	Annual	\$264.00
Milford	7,975,000	Unit	90.00%	Annual	\$143.00
Jewett City	313,000	Flow	90.00%	Quarterly	\$290.46
Vernon	4,292,000	Flow	90.00%	Quarterly	\$150.00
Brooklyn	90,000	Unit	88.00%	Annual	\$172.00
Putnam	1,105,000	Unit	88.00%	Quarterly	\$143.44
Somers	39,000	Unit	88.00%	Annual	\$135.00
Bridgeport	30,544,000	Flow	87.00%	Quarterly	\$220.00
New Haven	32,717,000	Flow	87.00%	Quarterly	\$157.00
Ledyard	183,000	Flow	86.00%	Quarterly	\$396.00
Sterling	not reported	Unit	85.00%	Annual	\$350.00
Thompson	226,000	Unit	85.00%	Annual	\$197.10
Trumbull	3,100,000	Unit	85.00%	Quarterly	\$292.00
Waterbury	19,645,000	Flow	84.00%	Quarterly	\$180.00
Canton	487,000	Unit + Flow	80.00%	Annual	\$195.00
New Milford	517,000	Unit + Flow	80.00%	Annual	\$347.30
Seymour	1,223,000	Flow	75.00%	Semi	\$120.00
Meriden	8,951,000	Flow	72.00%	Semi	\$162.00
Coventry	59,000	Unit	64.00%	Semi	\$225.00

Getting The Work Done: How Many Hands Does It Take?

Our survey asked how many people the town employs to operate, maintain, and manage the wastewater collection and treatment facilities. The responses were to be broken down into three categories:

1. Administrative Staff
2. Operation and Maintenance Staff, Total
3. Operation and Maintenance Staff, Collection System

Plant size, processes, age of facilities, and size of collection system each play a part in determining how many people a given facility needs to operate within its permit limits, so any conclusions about these facilities must take this into consideration. In addition, only a few of the facilities have a separate collection system staff, or were able to segregate O&M costs for the collection system from the rest of the budget.

One confusing factor we discovered was the category in which to include the chief operator. At many facilities, the chief operator also performs a number of administrative functions, and was listed, either in whole or in part, on the administrative side of the staffing chart. Budgeting, record-keeping, and general correspondence, as well as public relations, often fall under the chief operator's responsibilities. The numbers shown on table 8a, therefore, should be reviewed with this in mind.

In general, the weighted average seems to indicate that the typical wastewater treatment facility in Connecticut employs slightly more than 1 administrator for each million gallons of flow it treats. Obviously, this ratio is going to be higher for small plants (even the smallest plants require at least one part-time administrator) and lower for large facilities (economy of scale reduces the total administrators necessary). Similarly, for each million gallons of flow, the typical Connecticut facility employs about 4 operations staff.

So how do we judge the "right" number of people to staff a wastewater treatment facility? The best method seems to be to look at facilities of similar size, and ask questions such as:

- Are the treatment processes similar? Are both of the same level of complexity?
- Are the treatment systems roughly the same age?
- Have the facilities been properly maintained in the past? Copying an improperly maintained facility will only lead you down the same path.
- Are the collection systems roughly the same size? (within 20-30%)
- Do the collection systems have roughly the same number of pumping stations?
- Are all maintenance and administrative functions being carried out by the WPCF staff, or is some done by the public works department or town hall?
- Do the facilities handle similar wastes? (i.e. percentage of industrial flow, food preparation or processing waste, etc.)

- How experienced is the staff?
- And most importantly, is the facility operating in compliance with its NPDES permit?

There will seldom be a precise match, but each of the above criteria could be justification to adjust the total staffing up or down. Discuss staffing needs with other facilities' staff as well as your own to get a feel for what is actually needed.

Not all towns were able to segregate out the operational costs of the collection system. For those who did, however, we show an average annual maintenance cost per mile of sewer line of about \$3,400. Note that this cost doesn't separate out the cost of the pumping stations in the collection system; if a cost per mile seems high, it is possible that the O&M of the pumping stations may be influencing the numbers. Also, in some cases, the annual O&M cost includes the cost of a sewer rehabilitation project. This non-recurring cost drives up several of the estimated per-mile maintenance costs. After making an allowance for pumping stations, the actual cost per mile of maintaining sewers systems may vary substantially. Please bear in mind that these are *very* approximate numbers, and need much more refining than some of the other data in this survey.

TABLE 8A
Staffing and System Maintenance (WPCFs with Sewer Systems)

Town	Ave Flow 1997	Treatment	Staff: Admin	Staff: O&M	Staff: Sewers	Total Staff	Admin / MG	O&M / MG	Miles of Sewer	Sewer Maint	Maint Cost per mile	Large PS	Small PS	Grinder Pumps
Redding	6,000	Denitr	0	0.5	0	0.5	0.0	83.3	1.0	\$800	\$800	0	1	0
Somers	39,000	Seco	1	0.5	0	1.5	25.6	12.8	3.0	\$3,000	\$1,000	0	1	0
Coventry	59,000	Seco	0.5	0.5	0	1	8.5	8.5	6.9	\$4,500	\$652	0	0	0
Deep River	84,000	Seco	0.5	2	0	2.5	6.0	23.8	5.5	\$2,750	\$500	0	2	4
Kent	84,000	Seco	1	2	0	3	11.9	23.8	3.0	\$0	\$0	0	1	0
Goshen	86,000	AWT	1	3	0	4	11.6	34.9	20.0	\$354,500	\$17,725	0	8	16
Sprague	182,000	Seco	0.5	2.5	0	3	2.7	13.7	8.0	\$94,000	\$11,750	0	4	0
Ledyard	183,000	Seco	1.5	3.5	0	5	8.2	19.1	7.5	\$275,286	\$36,705	0	3	1
Thompson	226,000	Seco	2	2.5	0	4.5	8.8	11.1	11.0	\$0	\$0	0	1	0
Norfolk	244,000	AWT	1	2	0	3	4.1	8.2	8.8	\$0	\$0	0	0	0
Beacon Falls	248,000	Seco	0	2	0	2	0.0	8.1	12.0	\$20,000	\$1,667	0	3	0
North Canaan	280,000	Seco	0	3	0	3	0.0	10.7	40.0	\$90,000	\$2,250	0	2	0
Jewett City	313,000	Seco	0	2	0	2	0.0	6.4	8.0	\$9,893	\$1,237	0	5	0
Southbury - Canton	425,000	Seco	0	4	0	4	0.0	9.4	30.0	\$153,000	\$5,100	0	5	0
Salisbury	491,000	AWT	0	2	0	2	0.0	6.2	15.0	\$20,000	\$1,333	0	2	0
New Milford	517,000	Seco P	3	5	0	8	5.8	9.7	21.0	\$25,000	\$1,471	0	4	0
Litchfield	544,000	Seco	1.5	3	0	4.5	2.8	5.5	21.0	\$30,676	\$1,461	0	5	0
Portland	641,000	Seco	0.5	3	0	3.5	0.8	4.7	20.0	\$30,000	\$1,429	0	1	0
Portland	641,000	Seco	0.5	3	0	3.5	0.8	4.7	20.0	\$100,000	\$5,000	0	2	0
Ridgefield	679,000	Denitr	1.5	4	0	5.5	2.2	5.9	12.0	\$20,200	\$1,683	0	3	0
Suffield	805,000	Seco	2	8	0	10	2.5	9.9	125.0	\$121,000	\$968	0	11	0
Watertown	831,000	Seco	1	4	0	5	1.2	4.8	27.5	\$12,000	\$436	0	0	4
Thomaston	893,000	Seco	1	5	0	6	1.1	5.6	35.0	\$10,000	\$286	0	4	0
Plymouth	928,000	Denitr	2	4	0	6	-2.2	4.3	43.0	\$20,000	\$465	0	8	0
East Hampton	1,080,000	Seco	2	5.5	2	9.5	1.9	5.1	50.0	\$214,704	\$4,294	0	14	110
Putnam	1,105,000	Seco	1.5	2	1.5	5	1.4	1.8	35.0	\$250,000	\$7,143	0	10	0
Plainfield	1,142,000	Seco	1	6	0	7	0.9	5.3	60.0	\$150,000	\$2,500	0	9	0
Seymour	1,223,000	Denitr	1	5	0	6	0.8	4.1	58.7	\$105,000	\$1,789	4	1	0
East Windsor	1,315,000	Seco	2	5	0	7	1.5	3.8	29.0	\$84,000	\$2,897	1	6	0
Stafford	1,343,000	Nitrif	1	3	0	4	0.7	2.2	21.0	\$6,000	\$286	0	4	0
Stonington	1,348,000	Seco	2	18	0	20	1.5	13.4	65.0	\$425,000	\$6,538	1	16	0
Windsor Locks	1,368,000	Seco	1.5	7	0	8.5	1.1	5.1	55.0	\$78,500	\$1,427	1	7	0
Winchester	1,419,000	Nitrif	2	4	6	12	1.4	2.8	40.0	\$59,280	\$1,482	2	7	313
New Canaan	1,465,000	Seco	1	4	0	5	0.7	2.7	25.0	\$0	\$0	0	3	0
Derby	1,493,000	Seco	1.5	8	0	9.5	1.0	5.4	35.0	\$25,000	\$714	0	5	0
Westport	1,865,000	Denitr	0	7	0	7	0.0	3.8	46.0	\$384,117	\$8,350	2	14	0
Cheshire	1,953,000	Nitrif	1	9.5	0	10.5	0.5	4.9	110.0	\$300,000	\$2,727	3	5	0
Glastonbury	2,029,000	Seco	2	8	0	10	1.0	3.9	92.0	\$165,000	\$1,793	1	7	0
Groton (City)	2,073,000	Seco	2	6	0	8	1.0	2.9	53.0	\$560,354	\$10,573	2	7	11

Note that Maintenance Cost Per Mile also includes cost of pumping stations

Staffing and System Maintenance (WPCFs with Sewer Systems), continued

Town	Ave Flow 1997	Treatment	Staff: Admin	Staff: O&M	Staff: Sewers	Total Staff	Admin / MG	O&M / MG	Miles of Sewer	Sewer Maint.	Maint Cost per mile	Large PS	Small PS	Grinder Pumps
Plainville	2,141,000	Nitrif	3	7	0	10	1.4	3.3	85.0	\$100,000	\$1,176	0	8	0
South Windsor	2,151,000	Seco	2	6	0	8	0.9	2.8	120.0	\$185,000	\$1,542	1	10	0
Ansonia	2,199,000	Seco	1.5	6	0	7.5	0.7	2.7	58.0	\$125,786	\$2,169	2	7	4
Shelton	2,263,000	Seco	2	7	0	9	0.9	3.1	60.0	\$120,000	\$2,000	4	1	0
Simsbury	2,291,000	Seco	1	7.5	0	8.5	0.4	3.3	60.0	\$150,000	\$2,500	1	4	0
Montville	2,357,000	Seco	3	8	0	11	1.3	3.4	95.0	\$198,000	\$2,084	2	11	92
Windham	2,570,000	Seco	1	4	2	7	0.4	1.6	43.0	\$75,000	\$1,744	0	2	0
Killingly	2,707,000	Seco	2	6	0	8	0.7	2.2	42.0	\$45,000	\$1,071	2	7	50
Groton (Town)	3,157,000	Seco	3	10	10	23	1.0	3.2	125.5	\$1,014,107	\$8,081	6	16	144
North Haven	3,453,000	Nitrif	2	9	0	11	0.6	2.6	110.0	\$240,000	\$2,182	1	7	1
Farmington	3,678,000	Nitrif	2	8	2	12	0.5	2.2	87.0	\$219,000	\$2,517	11	5	0
Branford	3,884,000	Seco	1	4.5	4.5	10	0.3	1.2	100.0	\$250,000	\$2,500	6	42	0
Norwich	3,940,000	Seco	5	8	6	19	1.3	2.0	100.0	\$400,000	\$4,000	9	7	6
Middletown	3,961,000	Seco	6	4	6	16	1.5	1.0	130.0	\$1,028,148	\$7,909	2	16	1
Vernon	4,292,000	Nitrif	4.5	18.5	2	25	1.0	4.3	84.0	\$154,000	\$1,833	2	5	0
Southington	4,330,000	Nitrif	1	11	0	12	0.2	2.5	100.0	\$60,000	\$600	1	8	0
Wallingford	5,318,000	AWT	8	14	10	32	1.5	2.6	189.0	\$696,200	\$3,684	2	10	0
Torrington	5,331,000	Nitrif	2.5	7	3	12.5	0.5	1.3	230.0	\$150,000	\$652	4	14	1
Enfield	5,333,000	Seco	2	4	1	7	0.4	0.8	300.0	\$522,250	\$1,741	4	13	7
Naugatuck	5,557,000	Nitrif	6	18	0	24	1.1	3.2	91.0	\$55,000	\$604	0	5	0
Manchester	6,510,000	Nitrif	8	15.5	7.5	31	1.2	2.4	146.0	\$505,088	\$3,460	0	5	0
New London	7,118,000	Seco	4	10	4	18	0.6	1.4	75.0	\$1,266,900	\$16,892	9	1	0
West Haven	7,422,000	Denitr	7	18	0	25	0.9	2.4	135.0	\$90,000	\$667	5	8	0
Milford	7,975,000	Denitr	7	18	6	31	0.9	2.3	226.0	\$70,000	\$310	7	35	1
Stratford	8,470,000	Denitr	5	13	7	25	0.6	1.5	200.0	\$1,044,102	\$5,221	8	11	0
Fairfield	8,861,000	Seco	2	15	0	17	0.2	1.7	180.0	\$200,000	\$1,111	1	7	0
Meriden	8,951,000	Nitrif	2	19	0	21	0.2	2.1	180.0	\$105,000	\$583	2	1	0
Danbury	9,258,000	Nitrif	3	12	0	15	0.3	1.3	150.0	\$202,000	\$1,347	2	11	0
Bristol	10,657,000	Nitrif	3.5	27	4	34.5	0.3	2.5	230.0	\$256,000	\$1,113	2	12	0
Greenwich	11,307,000	Seco	3	15	6	24	0.3	1.3	150.0	\$500,000	\$3,333	4	17	0
Norwalk	15,070,000	Denitr	4	21	8	33	0.3	1.4	200.0	\$1,039,450	\$5,197	14	12	0
Mattabassett	17,633,000	Seco	3.5	25	0	28.5	0.2	1.4	8.0	\$5,000	\$625	1	0	0
Waterbury	19,645,000	Seco	9	26	5	40	0.5	1.3	300.0	\$600,000	\$2,000	3	18	0
Stamford	21,232,000	AWT	4	22	5	31	0.2	1.0	250.0	\$500,000	\$2,000	4	14	0
Bridgeport	30,544,000	Seco	19	50	12	81	0.6	1.6	300.0	\$3,089,000	\$10,297	9	2	0
New Haven	32,717,000	Denitr	15	32	18	65	0.5	1.0	260.0	\$1,700,000	\$6,538	10	5	0
Hartford MDC	67,272,000	Seco	30	244	0	274	0.4	3.6	1230.0	\$5,000,000	\$4,065	8	56	0

Note that Maintenance Cost Per Mile also includes cost of pumping stations

TABLE 8B
Staffing and System Maintenance (Sewer Systems only)

Town	Ave Flow 1997	Treatment	Staff: Admin	Staff: O&M	Staff: Sewers	Total Staff	Admin / MG	O&M / MG	Miles of Sewer	Sewer Maint	Maint Cost per mile	Large PS	Small PS	Grinder Pumps
Sewer Systems Only (in order of collection system size)														
Morris	60,000	N/A	0	0	0	0			1.0	\$0	\$0	0	0	30
Sterling	Not reported	N/A	0	0	0	0			3.0	\$39,060	\$13,020	0	1	0
Harwinton	55,000	N/A	0.5	0	0	0.5			4.0	\$4,000	\$1,000	0	0	15
Mansfield	260,000	N/A	0	0	0	0			5.0	\$3,500	\$700	0	1	0
Brooklyn	90,000	N/A	0	0	0	0			8.0	\$0	\$0	1	1	0
Woodbridge	568,000	N/A	0	0	0	0			8.0	\$15,000	\$1,875	0	1	0
Wilton	410,000	N/A	2	0	0	2			9.0	\$0	\$0	0	1	0
Burlington	24,000	N/A	0.5	0	0.5	1			10.0	\$6,500	\$650	0	1	54
Oxford	44,000	N/A	0	0	1	1			10.0	\$46,540	\$4,654	1	0	0
Hebron	120,000	N/A	1.5	0	0	1.5			20.0	\$235,000	\$11,750	0	8	56
Ellington	317,000	N/A	0.5	0	1.5	2			25.0	\$136,058	\$5,442	0	6	108
East Lyme	700,000	N/A	2	1	3	6			28.0	\$493,000	\$17,607	2	12	0
Bethel	1,200,000	N/A	1	0	3	4			30.0	\$200,000	\$6,667	1	6	0
Middlebury	800,000	N/A	1	1.5	0	2.5			32.0	\$310,000	\$9,688	3	4	0
Colchester	500,000	N/A	0.75	0	0	0.75			35.0	\$219,663	\$6,276	1	2	0
Berlin	Not reported	N/A	1.5	3	0	4.5			39.1	\$623,000	\$15,934	3	9	7
Avon	670,000	N/A	1	0	1.5	2.5			47.0	\$37,000	\$787	0	2	0
North Branford	675,000	N/A	0	0	0.5	0.5			53.0	\$100,000	\$1,887	2	3	0
Wolcott	750,000	N/A	2.5	0	1.5	4			53.0	\$210,000	\$3,962	0	2	0
Darien	2,000,000	N/A	2.5	0	3	5.5			90.0	\$638,805	\$7,098	2	11	26
Trumbull	3,100,000	N/A	1	0	2	3			100.0	\$190,000	\$1,900	6	2	0
Waterford	1,600,000	N/A	1	0	5	6			120.0	\$884,120	\$7,368	2	22	180
Hamden	8,158,000	N/A	0	0	7	7			175.0	\$425,200	\$2,430	2	5	0
New Britain	12,600,000	N/A	2.5	0	13	15.5			180.0	\$1,412,000	\$7,844	1	0	0
East Haven	4,000,000	N/A	3	0	8	11			200.0	\$0	\$0	2	4	0

Note that Maintenance Cost Per Mile also includes cost of pumping stations

Wastewater On Wheels: Handling Septage Needs

The past decade has seen a shift in the type of wastewater solution which has been chosen by municipalities, as well as a heightened interest in taking steps to prevent problems from occurring. The once-popular option of extending sewers to all corners of the town with state and federal subsidies has been greatly curtailed because of the loss of those subsidies. The result of this is an increased emphasis on onsite wastewater management (also known as sewer avoidance).

One of the primary considerations in an onsite management program is providing adequate and appropriate means of septage disposal. At one time, this meant securing and operating a septage lagoon, but recent permitting requirements have resulted in the closing of many existing lagoons, and the inability to site new facilities which meet the current strict environmental requirements. As a result, more septage is being conveyed for treatment to existing wastewater treatment facilities.

The following table lists whether treatment facilities are accepting septage, and what rates are charged. If an entry "N/A" appears, then the service is "Not Available" at that facility. "NC In-town only" indicates that the facility takes septage only from residents of the town, but does not charge them for the service.

A number of communities charge different rates for septage originating outside their borders, or simply refuse to accept septage from outside sources. The charging of different rates is justified by assuming that in-town customers have already paid the capital cost of the septage treatment and receiving facilities, and the incremental costs for others covers the out-of-town share of that cost. Other facilities will accept only septage from communities which have contractual agreements with the host community. In these cases, the outside communities have made some arrangement to reimburse the host community for a portion of the capital cost in exchange for access to the septage facility.

On the average, treatment facilities charge about \$50 per 1,000 gallons of septage discharged at the facility. This can vary somewhat based on a variety of factors, including treatment process; contractual obligations, grant funding, etc.

TABLE 9
Handling Septage Needs

Town	Ave Flow 1997	Treatment	Septage in-town cost	Septage out of town cost	Load Type
Ansonia	2,199,000	Seco	\$50.00	N/A	1000 gal
Beacon Falls	248,000	Seco	\$0.00	N/A	NC In-town only
Branford	3,884,000	Seco	\$5.00	N/A	Load
Bridgeport	30,544,000	Seco	\$150.00	\$150.00	3000 gal
Bristol	10,657,000	Nitrif	\$53.00	\$84.00	1000 gal
Canton	487,000	AWT	N/A	N/A	N/A
Cheshire	1,953,000	Nitrif	\$48.00	N/A	1000 gal
Coventry	59,000	Seco	N/A	N/A	N/A
Danbury	9,258,000	Nitrif	\$62.32	\$62.32	1000 gal
Deep River	84,000	Seco	\$35.00	\$70.00	1000 gal
Derby	1,493,000	Seco	\$25.00	N/A	1000 gal
East Hampton	1,080,000	Seco	\$40.00	\$50.00	2000 gal (Note 2)
East Windsor	1,315,000	Seco	\$25.00	N/A	1000 gal
Enfield	5,333,000	Seco	\$0.00	N/A	NC In-town only
Fairfield	8,861,000	Seco	\$140.00	\$180.00	4000 gal
Farmington	3,678,000	Nitrif	N/A	N/A	N/A
Glastonbury	2,029,000	Seco	\$25.00	N/A	500 gal
Goshen	86,000	AWT	\$47.00	N/A	1000 gal
Greenwich	11,307,000	Seco	\$70.00	N/A	1000 gal
Groton (City)	2,073,000	Seco	\$0.00	N/A	NC In town only
Groton (Town)	3,157,000	Seco	\$0.00	N/A	NC In town only
Hartford MDC	67,272,000	Seco	\$55.00	\$55.00	1500 gal
Jewett City	313,000	Seco	N/A	N/A	N/A
Kent	84,000	Seco	\$50.00	\$75.00	1000 gal
Killingly	2,707,000	Seco	\$66.00	\$66.00	3000 gal
Ledyard	183,000	Seco	N/A	N/A	N/A
Litchfield	544,000	Seco	\$45.00	\$90.00	1000 gal
Manchester	6,510,000	Nitrif	\$42.00	\$42.00	1000 gal
Mattabassett	17,633,000	Seco	\$65.00	\$65.00	1000 gal
Meriden	8,951,000	Nitrif	\$60.00	N/A	1000 gal
Middletown	3,961,000	Seco	\$30.00	N/A	1000 gal
Milford	7,975,000	Denitr	\$30.00	N/A	1000 gal
Montville	2,357,000	Seco	\$100.00	N/A	2000 gal
Naugatuck	5,557,000	Nitrif	\$0.00	\$0.00	varies, see note 1
New Canaan	1,465,000	Seco	\$50.00	N/A	1000 gal
New Haven	32,717,000	Denitr	\$65.00	\$65.00	1000 gal (Note 2)
New London	7,118,000	Seco	\$56.00	N/A	1000 gal
New Milford	517,000	Seco P	\$75.00	N/A	1000 gal
Norfolk	244,000	AWT	N/A	N/A	N/A
North Canaan	280,000	Seco	N/A	N/A	N/A
North Haven	3,453,000	Nitrif	\$62.00	\$92.00	1000 gal
Norwalk	15,070,000	Denitr	\$50.00	N/A	1000 gal
Norwich	3,940,000	Seco	\$56.00	N/A	1000 gal
Plainfield	1,142,000	Seco	N/A	N/A	N/A
Plainville	2,141,000	Nitrif	\$50.00	N/A	1000 gal
Plymouth	928,000	Denitr	\$65.00	N/A	1000 gal

Handling Septage Needs, *continued*

Town	Ave Flow 1997	Treatment	Septage in- town cost	Septage out of town cost	Load Type
Portland	641,000	Seco	\$35.00	N/A	1500 gal
Putnam	1,105,000	Seco	N/A	N/A	N/A
Redding	6,000	Denitr	N/A	N/A	N/A
Ridgefield	679,000	Denitr	\$50.00	N/A	1500 gal
Salisbury	491,000	AWT	N/A	N/A	N/A
Seymour	1,223,000	Denitr	\$40.00	N/A	1000 gal
Shelton	2,263,000	Seco	\$50.00	N/A	1000 gal
Simsbury	2,291,000	Seco	\$45.00	N/A	1000 gal
Somers	39,000	Seco	N/A	N/A	N/A
South Windsor	2,151,000	Seco	\$30.00	N/A	1500 gal
Southbury -	425,000	Seco	N/A	N/A	N/A
Southington	4,330,000	Nitrif	\$50.00	N/A	1000 gal
Sprague	182,000	Seco	\$56.00	\$56.00	1000 gal
Stafford	1,343,000	Nitrif	\$35.00	N/A	1000 gal
Stamford	21,232,000	AWT	\$50.00	\$75.00	1000 gal
Stonington	1,348,000	Seco	\$50.00	N/A	1000 gal
Stratford	8,470,000	Denitr	\$36.81	N/A	1000 gal
Suffield	805,000	Seco	\$40.00	N/A	2500 gal
Thomaston	893,000	Seco	\$80.00	\$100.00	1000 gal
Thompson	226,000	Seco	N/A	N/A	N/A
Torrington	5,331,000	Nitrif	\$75.00	\$75.00	1000 gal
Vernon	4,292,000	Nitrif	\$45.00	\$45.00	1000 gal
Wallingford	5,318,000	AWT	\$60.00	N/A	1000 gal
Waterbury	19,645,000	Seco	\$60.00	\$60.00	1000 gal
Watertown	831,000	Seco	N/A	N/A	N/A
West Haven	7,422,000	Denitr	\$35.00	N/A	1000 gal (Note 2)
Westport	1,865,000	Denitr	\$50.00	N/A	1000 gal
Winchester	1,419,000	Nitrif	\$30.00	\$50.00	1000 gal
Windham	2,570,000	Seco	\$50.00	\$50.00	1000 gal
Windsor Locks	1,368,000	Seco	\$25.00	N/A	1000 gal

Note 1: Naugatuck charges different rates depending on the source community.

Note 2: Several communities have contracts allowing the "in-town" rate to other sources.

The Other Half Of The Equation: Industrial Flows

It is a fact of life that nothing is ever as simple as we'd like it to be, and this is true in wastewater treatment as well as anywhere else. If the only flow that WPCFs had to deal with was domestic sewage, life would certainly be easier. The reality, of course, is that the treatment of industrial wastewater in conjunction with domestic flows at the municipal WPCF is often the most environmentally sound alternative.

The survey asked two questions about the industrial component of the influent: how much flow is there, and what is the basis for industrial user charges.

According to the responses, industrial discharges account for about 10% of the total volume discharged to the WPCFs. Roughly one third of the respondents indicated that they had no industrial flow entering their system. As a caveat here, this may also indicate that, in these communities, the industries are pre-treating their wastewater to a concentration equivalent to domestic sewage; the town therefore has no reason to treat them any differently than any other customer.

Many municipalities bill industrial users on the basis of water consumption (49 total); 25 use this as the sole basis for billing, and another 8 use water consumption with a surcharge for high strength wastes.

In smaller communities, where public water supplies may not be available, the equivalent dwelling unit method is used (19 total). Twenty-two (22) communities indicated they use metered discharges, in whole or in part, upon which to base the billing to the industries.

A total of 18 communities impose a surcharge for high strength wastes being discharged to the sewer system.

Surcharges For High Strength Discharges

Typically, raw wastewater entering a treatment facility from purely domestic sources will average from 200 to 300 mg/l of BOD and suspended solids, if there is no significant infiltration or inflow to dilute it. Occasionally, however, a commercial or industrial discharge will be present whose characteristics are much greater than the average concentration. In this case, the municipality has three options:

1. Treat and bill the waste no differently than other discharges. The additional costs of treatment are distributed system-wide.
2. Require the discharger to pre-treat the waste to within acceptable standards. The additional costs are totally borne by the discharger.
3. Place a surcharge on the user charge of the discharger, and treat the waste at the municipal facility.

The surcharge mentioned in the third option is based on the additional costs of operating individual processes which are designed to treat the waste in question. The example below demonstrates a typical method of calculating such a surcharge.

EXAMPLE #2

Plainbury, Connecticut has an annual water pollution control budget of \$500,000, broken down by process in the following manner

Unit Process	Annual Operating Cost
Collection System	\$ 75,000
Grit & Screening	\$ 8,000
Primary Clarifier	\$ 20,000
Aeration & Secondary Clarifier	\$ 100,000
Disinfection	\$ 50,000
Sludge Processing	\$ 150,000
Administrative	\$ 62,000
Reserve Fund	\$ 35,000
TOTAL	\$ 500,000

Note that the annual costs shown above include all labor, indirect, energy, and chemical costs. The next step is to estimate the percentage of each process cost which is attributable to handling the wastewater characteristics for which you are billing. For the Plainbury plant, the chief operator has estimated that the cost of operating the various processes is related to volume, BOD loading, and suspended solids concentration in the following manner:

Unit Process	Volume	BOD	Suspended Solids
Collection System	100%	0%	0%
Grit & Screening	0%	0%	100%
Primary Clarifier	80%	0%	20%
Aeration & Secondary Clarifier	0%	100%	0%
Disinfection	100%	0%	0%
Sludge Processing	0%	50%	50%

Note that the percentages shown above are for this example only. Use your own estimates for your facility.

Each of the percentages is then applied to the unit process cost shown in the previous table. This allows you to calculate the total cost of treating each component of the wastewater under normal conditions.

Unit Process	Volume	BOD	Suspended Solids
Collection System	\$ 75,000		
Grit & Screening		\$ 8,000	
Primary Clarifier	\$ 16,000	\$ 4,000	
Aeration & Secondary Clarifier	\$100,000		
Disinfection	\$ 50,000		
Sludge Processing		\$ 75,000	\$ 75,000
Subtotal	\$141,000	\$175,000	\$ 87,000
Administrative *	\$ 21,700	\$ 27,000	\$ 13,300
Reserve Fund **	\$ 10,000	\$ 15,000	\$ 10,000
TOTAL	\$172,700	\$217,000	\$110,300

* Administrative costs were pro-rated based on the operating cost for each category.

** Reserve fund costs are based on projected maintenance demands for each process

The next step is to calculate what it actually costs to treat a pound of BOD or suspended solids. At the Plainbury facility, the average influent BOD concentration is 250 ppm, and the average suspended solids concentration is 280 ppm, which results in the following:

Annual BOD loading: $250 \text{ ppm} \times 8.34 \times 1.00 \text{ mgd} \times 365 \text{ days/year} = 761,025 \text{ lb/year}$

and the cost to treat a pound of BOD is

$$\frac{\$217,000 \text{ per year}}{761,025 \text{ lb/year}} = \$0.285 \text{ per pound}$$

Annual suspended solids loading: $280 \text{ ppm} \times 8.34 \times 1.00 \text{ mgd} \times 365 \text{ days/year} = 852,348 \text{ lb/year}$

and the cost to treat a pound of suspended solids is

$$\frac{\$110,300 \text{ per year}}{852,348 \text{ lb/year}} = \$0.129 \text{ per pound}$$

With these numbers in hand, the wastewater facility manager may reasonably place surcharges on sewer system users who discharge unusual strength wastes to the sanitary sewer system. These surcharges are applied to the excess strength of the discharge above some pre-set value. Plainbury has set their limiting concentration at 350 ppm for BOD and suspended solids. If an industry was discharging wastewater with a suspended solids concentration of 600 ppm to the Plainbury WPCF, the surcharge would apply to the difference between the industry's concentration and the limiting concentration set by the WPCA, or

$$600 \text{ ppm} - 350 \text{ ppm} = 250 \text{ ppm}$$

and if the industry was discharging an average of 15,000 gpd, the surcharge calculations would look like this:

$$250 \text{ ppm} \times 8.34 \times 0.015 \text{ mgd} \times 365 \text{ days/year} \times \$0.129 \text{ per pound} = \$1,472.58.$$

The total of all surcharges should be deducted from the total cost of operating the facility before apportioning the costs among the remaining users according to flow. Remember that these charges are in addition to the normal user charges billed to the industry based purely on volume.

TABLE 10
Industrial Flows and Billing Methods

Town	Ave Flow 1997	Treatment	Industrial Flow	Industrial % Flow	Industrial Billing
Bridgeport	30,544,000	Seco	0	0.0%	Mw
Brooklyn	90,000	N/A	0	0.0%	N/A
Burlington	24,000	N/A	0	0.0%	N/A
Canton	487,000	AWT	9	0.0%	Mw
Darien	2,000,000	N/A	0	0.0%	N/A
East Haven	4,000,000	N/A	0	0.0%	N/A
East Lyme	700,000	N/A	0	0.0%	N/A
Ellington	317,000	N/A	0	0.0%	E, M
Enfield	5,333,000	Seco	0	0.0%	O
Goshen	86,000	AWT	0	0.0%	N/A
Greenwich	11,307,000	Seco	0	0.0%	N/A
Harwinton	55,000	N/A	0	0.0%	N/A
Hebron	120,000	N/A	0	0.0%	N/A
Jewett City	313,000	Seco	0	0.0%	Mw
Kent	84,000	Seco	0	0.0%	N/A
Ledyard	183,000	Seco	0	0.0%	N/A
Mansfield	260,000	N/A	0	0.0%	N/A
Mattabassett Dist	17,633,000	Seco	0	0.0%	N/A
Morris	60,000	N/A	0	0.0%	E
New Canaan	1,465,000	Seco	0	0.0%	N/A
Norfolk	244,000	AWT	0	0.0%	N/A
Plainfield	1,142,000	Seco	0	0.0%	E
Redding	6,000	Denitr	0	0.0%	N/A
Ridgefield	679,000	Denitr	0	0.0%	N/A
Salisbury	491,000	AWT	0	0.0%	N/A
Seymour	1,223,000	Denitr	0	0.0%	E, M, Mw
Southbury - Heritage V	425,000	Seco	0	0.0%	N/A
Sprague	182,000	Seco	0	0.0%	Mw
Sterling	Not reported	N/A	0	0.0%	E
Waterford	1,600,000	N/A	0	0.0%	N/A
Westport	1,865,000	Denitr	0	0.0%	E
Wilton	410,000	N/A	0	0.0%	E
New London	7,118,000	Seco	5,000	0.1%	Mw
Groton (Town)	3,157,000	Seco	6,000	0.2%	M, Mw, S
Ansonia	2,199,000	Seco	5,000	0.2%	Mw
Middletown	3,961,000	Seco	15,600	0.4%	Mw
Colchester	500,000	N/A	4,000	0.8%	Mw
New Milford	517,000	Seco P	5,500	1.1%	O
Simsbury	2,291,000	Seco	25,000	1.1%	E, M, Mw
Deep River	84,000	Seco	1,000	1.2%	E, S
East Windsor	1,315,000	Seco	25,000	1.9%	Mw
East Hampton	1,080,000	Seco	26,000	2.4%	E
Hamden	8,158,000	N/A	200,000	2.5%	AV
Somers	39,000	Seco	1,000	2.6%	E
Winchester	1,419,000	Nitrif	43,000	3.0%	E, M
Litchfield	544,000	Seco	17,000	3.1%	E, O
Plymouth	928,000	Denitr	30,000	3.2%	Mw
Thomaston	893,000	Seco	30,000	3.4%	M, Mw, S
Fairfield	8,861,000	Seco	300,000	3.4%	Mw
Avon	670,000	N/A	24,000	3.6%	Mw
Bristol	10,657,000	Nitrif	400,000	3.8%	M, Mw, S
Windham	2,570,000	Seco	100,000	3.9%	M, Mw
Waterbury	19,645,000	Seco	800,000	4.1%	M, Mw, S
Cheshire	1,953,000	Nitrif	80,000	4.1%	E, M, Mw, S

Industrial Flows and Billing Methods, *continued*

Town	Ave Flow 1997	Treatment	Industrial Flow	Industrial % Flow	Industrial Billing
New Britain	12,600,000	N/A	548,000	4.3%	Mw
Shelton	2,263,000	Seco	100,000	4.4%	E
Branford	3,884,000	Seco	175,000	4.5%	O
Plainville	2,141,000	Nitrif	100,000	4.7%	M
Farmington	3,678,000	Nitrif	200,000	5.4%	Mw, O
Trumbull	3,100,000	N/A	171,000	5.5%	Mw
Wallingford	5,318,000	AWT	300,000	5.6%	Mw
North Haven	3,453,000	Nitrif	200,000	5.8%	Mw, S
Windsor Locks	1,368,000	Seco	81,780	6.0%	Mw, S
Watertown	831,000	Seco	50,000	6.0%	AV
West Haven	7,422,000	Denitr	500,000	6.7%	Mw
Manchester	6,510,000	Nitrif	450,000	6.9%	M, Mw, S
Stonington	1,348,000	Seco	100,000	7.4%	Mw
Meriden	8,951,000	Nitrif	750,000	8.4%	M
Portland	641,000	Seco	55,000	8.6%	Mw
Thompson	226,000	Seco	20,000	8.8%	Mw
Norwalk	15,070,000	Denitr	1,500,000	10.0%	O
Vernon	4,292,000	Nitrif	450,000	10.5%	M
Wolcott	750,000	N/A	85,000	11.3%	E
North Branford	675,000	N/A	80,000	11.9%	Mw
Milford	7,975,000	Denitr	1,000,000	12.5%	Mw, S
Glastonbury	2,029,000	Seco	270,000	13.3%	Mw
Torrington	5,331,000	Nitrif	750,000	14.1%	Mw
Stamford	21,232,000	AWT	3,000,000	14.1%	Mw, S
Hartford MDC	67,272,000	Seco	10,000,000	14.9%	M, S, O
Woodbridge	568,000	N/A	85,200	15.0%	M
Coventry	59,000	Seco	9,000	15.3%	E
New Haven	32,717,000	Denitr	5,200,000	15.9%	M, Mw, S
Southington	4,330,000	Nitrif	700,000	16.2%	Mw
Danbury	9,258,000	Nitrif	1,500,000	16.2%	Mw
Bethel	1,200,000	N/A	200,000	16.7%	E, M, Mw
Beacon Falls	248,000	Seco	50,000	20.2%	M
South Windsor	2,151,000	Seco	507,000	23.6%	M, Mw, S
Stratford	8,470,000	Denitr	2,000,000	23.6%	Mw, S
Derby	1,493,000	Seco	356,000	23.8%	Mw
Naugatuck	5,557,000	Nitrif	1,400,000	25.2%	O
Norwich	3,940,000	Seco	1,000,000	25.4%	M, Mw
Putnam	1,105,000	Seco	350,000	31.7%	Mw, S
North Canaan	280,000	Seco	90,000	32.1%	E, Mw
Stafford	1,343,000	Nitrif	473,780	35.3%	M, Mw
Middlebury	800,000	N/A	300,000	37.5%	O
Montville	2,357,000	Seco	900,000	38.2%	M, S, O
Suffield	805,000	Seco	350,000	43.5%	M, Mw, S
Killingly	2,707,000	Seco	1,500,000	55.4%	Mw, S
Groton (City)	2,073,000	Seco	1,400,000	67.5%	AV
Oxford	44,000	N/A	40,000	90.9%	O
Berlin	Not reported	N/A	275,619	N/A	M

Key for Industrial Billing Methods
 N/A Not Applicable
 E Estimated Equivalent Dwelling Units
 M Metered Discharge
 Mw Metered Water Consumption
 S Surcharge for High Strength
 O Other Method
 AV All costs covered in general tax base.

Appendix 1: Model User Charge System

ARTICLE 1: GENERAL

An ordinance establishing user charges in the town/city/borough of _____ for the purpose of providing funds for the operation and maintenance expenses associated with the municipal wastewater collection, conveyance, and treatment facilities.

As provided for under Section 7-255 et seq. of the Connecticut General Statutes, the Water Pollution Control Authority (WPCA) is empowered to establish and revise fair and reasonable charges for the use of the municipal sewerage system. The owner of property against which any such use charge is levied shall be liable for the payment thereof. Municipally owned and other tax-exempt property which uses the sewerage system shall be subject to such charges under the same conditions as are the owners of other property.

No charge for the use of the municipal sewerage system shall be established or revised until after a public hearing before the WPCA, at which owners of property which use the sewerage system shall have an opportunity to be heard concerning the proposed charges. Notice of the time, date, and place of such hearing shall be published at least ten days before the hearing in a newspaper having a general circulation in the municipality, and a copy of the proposed charges shall be on file in the office of the Town Clerk for public inspection at least ten days before the date of the hearing.

Within five days of having established such charges, the WPCA shall cause the same to be published in a newspaper having a general circulation in the municipality.

ARTICLE 2: DEFINITIONS

BOD: Biochemical oxygen demand. The quantity of oxygen utilized in the biochemical oxidation of organic matter in a specific time and at a specified temperature, usually 5 days and 20° C.

ppm: Parts per million.

Sewerage System: A collective term used to describe all the property involved in wastewater treatment and disposal, including sewer lines and appurtenances, pumping stations, treatment facilities, and land.

Suspended Solids: Solids that either float on the surface of or are in suspension in water, wastewater, or other liquids and that are removable by a standard laboratory filtering procedure.

WPCA: The municipality's Water Pollution Control Authority, as authorized by Connecticut General Statutes § 7-246.

ARTICLE 3: CALCULATION OF CHARGES

The total cost of the operation and maintenance of the sewerage system, including replacement fund, (OM&R cost) shall be recovered from the users of the system. Each user's share of the OM&R cost of the sewerage system shall be in proportion to the user's contribution to the total wastewater loading of the sewerage system. All users shall be charged on the basis of their total wastewater contribution. Surcharges shall be added to the volume based charges for wastewater discharges whose BOD or suspended solids concentrations are in excess of 300 ppm, or for discharges whose other constituents result in an identifiable increase in wastewater conveyance, treatment, or disposal costs.

The WPCA will review the sewer user charges annually and revise the rates as necessary to ensure that adequate revenues are generated to recover all OM&R costs and that the rate structure continues to distribute the costs of wastewater collection and treatment among the users in proportion to their contribution.

ARTICLE 4: COLLECTION AND PAYMENT

All sewer use charges shall be billed quarterly through the WPCA and shall be paid in full within a period of thirty days after same is declared due and payable unless otherwise stated on the billing form.

Any charge for the use of a sewerage system, not paid within thirty days of the due date, shall thereupon be delinquent and shall bear interest from the due date at the rate and in the manner provided by the general statutes for delinquent property taxes. Each addition of interest shall be collectible as a part of such connection or use charge. Any such unpaid connection or use charge shall constitute a lien upon the real estate against which such charge was levied from the date it became delinquent. Each such lien may be continued, recorded and released in the manner provided by the general statutes for continuing, recording and releasing property tax liens. Each such lien shall take precedence over all other liens and encumbrances except taxes and may be foreclosed in the same manner as a lien for property taxes.

All revenues collected under the provisions of this ordinance shall be kept separate from any other funds of the municipality and shall be used solely for the purposes stated in Article 1 of this ordinance, and for no other purpose. Fiscal year-end balances shall be used to defray the following year's costs, or shall be deposited in a non-lapsing fund established for replacement of major mechanical components which could reasonably be expected to require replacement during the useful life of the treatment works. If, as a result of a shortfall, funds have been transferred from other sources into the sewerage funds account, those funds shall be repaid at the beginning of the next fiscal year, and the sewer user charge shall be increased to cover the transfer of these funds.

ARTICLE 5: APPEALS AND ADJUSTMENTS

Any person aggrieved by any charge for the use of the sewerage system may make written appeal to the WPCA within thirty days of the billing date, requesting a review of the user charge. This request shall, where necessary, show the actual or estimated flow and/or strength of the discharge in comparison with the values upon which the charge is based, including how the measurements or estimates were made.

Any person aggrieved by any charge for the use of a sewerage system may appeal to the superior court for the judicial district wherein the municipality is located and shall bring any such appeal to a return day of said court not less than twelve or more than thirty days after service thereof. The judgement of the court shall be final.

ARTICLE 6: CHARGES FOR SEPTAGE

Charges for disposing of septage at the water pollution control facility shall be based on the same criteria as that used to determine sewer rates; that is, volume and concentration of the individual discharge.

ARTICLE 7: ORDINANCE IN FULL FORCE

This ordinance shall be in full force and effect from and after its passage, approval, recording and publication as provided by law.

Passed and adopted by the _____ of _____,

State of Connecticut on the _____ day of _____,

Attest:

_____ (signed, Town Clerk) _____ (date)

Appendix 2: Relevant State Statutes

Section 7-255. Charges. Hearing. Appeal. Payment by municipalities of charges upon specified classification of property or users. Optional payment plans. (a) The water pollution control authority may establish and revise fair and reasonable charges for connection with and for the use of a sewerage system. The owner of property against which any such connection or use charge is levied shall be liable for the payment thereof. Municipally-owned and other tax-exempt property which uses the sewerage system shall be subject to such charges under the same conditions as are the owners of other property, but nothing herein shall be deemed to authorize the levying of any property tax by any municipality against any property exempt by the general statutes from property taxation. No charge for connection with or for the use of a sewerage system shall be established or revised until after a public hearing before the water pollution control authority at which the owner of property against which the charges are to levied shall have an opportunity to be heard concerning the proposed charges. Notice of the time, place and purpose of such hearing shall be published at least ten days before the date thereof in a newspaper having a general circulation in the municipality. A copy of the proposed charges shall be on file in the office of the clerk of the municipality and available for inspection by the public for at least ten days before the date of such hearing. When the water pollution control authority has established or revised such charges, it shall file a copy thereof in the office of the clerk of the municipality and, not later than five days after such filing, shall cause the same to be published in a newspaper having a general circulation in the municipality. Such publication shall state the date on which such charges were filed and the time and manner of paying such charges and shall state that any appeals from such charges must be taken within twenty-one days after such filing. In establishing or revising such charges the water pollution control authority may classify the property connected or to be connected with the sewer system and the users of such system, including categories of industrial users, and may give consideration to any factors relating to the kind, quality or extent of use of any such property or classification of property or users including, but not limited to, (1) the volume of water discharged to the sewerage system, (2) the type or size of building connected with the sewerage system, (3) the number of plumbing fixtures connected with the sewerage system, (4) the number of persons customarily using the property served by the sewerage system, (5) in the case of commercial or industrial property, the average number of employees and guests using the property and (6) the quality and character of the material discharged into the sewerage system. The water pollution control authority may establish minimum charges for connection with and for the use of a sewerage system. Any person aggrieved by any charge for connection with or for the use of a sewerage system may appeal to the superior court for the judicial district wherein the municipality is located and shall bring any such appeal to a return day of said court not less than twelve or more than thirty days after service thereof. The judgement of the court shall be final.

(b) Any municipality may, by ordinance, provide for the payment to the water pollution control authority by such municipality of the whole or a portion of such charges for specified classifications of property or users; provided such classifications are established by the water pollution control authority in accordance with the provisions of subsection (a) of this section and meet the requirements of the federal Water Pollution Control Act Amendments of 1972, P.L. 92-500, as from time to time amended.

(c) Any municipality may, by ordinance, provide for optional methods of payment of sewer use charges to the water pollution control authority by (1) elderly taxpayers who are eligible for tax relief under the provisions of Section 12-129b, section 12-170aa or a plan of tax relief for elderly taxpayers provided by such municipality in accordance with section 12-129n or (2) any taxpayer under the age of sixty-five who is eligible for tax relief under the provisions of a plan for tax relief provided by such municipality in accordance with subdivision (2) of section 12-129n.

Section 7-258. Delinquent charge for connection or use. Lien. Any charge for connection with or for the use of a sewerage system, not paid within thirty days of the due date, shall thereupon be delinquent and shall bear interest from the due date at the rate and in the manner provided by the general statutes for delinquent property taxes. Each addition of interest shall be collectible as a part of such connection or use charge. Any such unpaid connection or use charge shall constitute a lien upon the real estate against which such charge was levied from the date it became delinquent. Each such lien may be continued, recorded and released in the manner provided by the general statutes for continuing, recording and releasing property tax liens. Each such lien shall take precedence over all other liens and encumbrances except taxes and may be foreclosed in the same manner as a lien for property taxes. The municipality may by ordinance designate the tax collector or any other person as collector of sewerage system connection and use charges and such collector of sewerage system connection and use charges may collect such charges in accordance with the provisions of the general statutes for collection of property taxes. The municipality may recover any such charges in a civil action against any person liable therefor. For the purpose of establishing or revising such connection or use charges and for the purpose of collecting such charges any municipality may enter into agreements with any water company or municipal water department furnishing water in such municipality for the purchase from such water company or municipal water department of information or services and such agreement may designate such water company or municipal water department as a billing or collecting agent of the collector of sewerage system connection and use charges in the municipality. Any water company or municipal water department may enter into and fulfill any such agreements and may utilize for the collection of such charges any of the methods utilized by it for the collection of its water charges.

Section 7-267. Use of funds. All benefit assessments and charges for connection with or use of the sewerage system, whether pledged for payment of bonds or notes or otherwise, shall be kept separate from any other funds of the municipality and shall be used for the sewerage system, including the payment of debt incurred for the sewerage system and interest thereon, and for no other purpose.

from CONNECTICUT GENERAL STATUTES CHAPTER 28: MUNICIPAL HOUSING PROJECTS: PART II: MODERATE RENTAL HOUSING

Section 8-71. Payment in lieu of taxes, assessments, and use charges. In lieu of real property taxes, special benefit assessments and sewerage system use charges otherwise payable to such municipality, except in such municipalities as, by special act or charter, on May 20, 1957, had a sewer use charge, an authority shall pay each year to the municipality in which any of its moderate rental housing projects are located a sum to be determined by the municipality, with the approval of the commissioner of housing, not in excess of twelve and one-half per cent of the shelter rent per annum for each occupied dwelling unit in any such housing project hereunder; except that the amount of such payment shall not be so limited in any case where funds are made available for such payment by an agency or department of the United States government, but no payment shall exceed the amount of taxes which would be paid on the property were the property not exempt from taxation.

from CONNECTICUT GENERAL STATUTES CHAPTER 28: MUNICIPAL HOUSING PROJECTS: PART VI: HOUSING FOR ELDERLY PERSONS

Section 8-118a. Payment in lieu of taxes and assessments. In lieu of real property taxes, special benefit assessments and sewerage system use charges otherwise payable to a municipality, a local authority shall pay each year, to the municipality in which any of its housing projects for elderly persons is located, a sum to be determined by the municipality, with the approval of the commissioner of housing not in excess of ten per cent of the shelter rent per annum for each occupied dwelling unit in any such housing project hereunder; except that the amount of such payment shall not be so limited in any case where funds are made available for such payment by an agency or department of the United States government, but no payment shall exceed the amount of taxes which would be paid on the property were the property not exempt from taxation.

from CONNECTICUT GENERAL STATUTES CHAPTER 28: MUNICIPAL HOUSING PROJECTS: PART VII: CONGREGATE HOUSING FOR THE ELDERLY

Section 8-119K. Payment in lieu of taxes. In lieu of real property taxes, special benefit assessments and sewerage system use charges otherwise payable to a municipality, an eligible developer approved by the commissioner of housing for state financial assistance for a congregate housing project shall pay each year, to the municipality in which any of its congregate housing projects for the elderly is located, a sum to be determined by the municipality with the approval of the commissioner of housing not in excess of ten per cent of the shelter rent per annum for each occupied dwelling unit in any such housing project hereunder; except that the amount of such payment shall not be so limited in any case where funds are made available for such payment by an agency or department of the United States government, but no payment shall exceed the amount of taxes which would be paid on the property were the property not exempt from taxation.

from CONNECTICUT GENERAL STATUTES CHAPTER 28: MUNICIPAL HOUSING PROJECTS: PART X: HOUSING FOR LOW INCOME PERSONS

Section 8-119gg. Payment in lieu of taxes and assessments. In lieu of real property taxes, special benefit assessments and sewerage system use charges otherwise payable to a municipality, a housing authority approved by the commissioner of housing for state financial assistance for a low income housing project shall pay each year, to the municipality in which any of its housing projects for low income families are located, a sum to be determined by the municipality with the approval of the commissioner of housing not in excess of ten per cent of the shelter rent per annum for each occupied dwelling unit in any such housing project hereunder; except that the amount of such payment shall not be so limited in any case where funds are made available for such payment by an agency or department of the United States government, but no payment shall exceed the amount of taxes which would be paid on the property were the property not exempt from taxation.

Closing Thoughts

Acknowledgments:

I'd like to thank all the municipal officials and employees who took the time to respond to our survey. The response rate was excellent (101 responses, covering 107 municipalities, out of 118) and the data should prove useful for many of those who participated.

Caveats:

Just a reminder for those using the data from this survey. The information contained in this survey is what was provided to me by the towns. I've only checked back with towns when the data seemed far from what other towns had reported. I'm sure there are cases where one person completing the survey did not interpret the question the same way as his or her counterpart in another town. While we've tried to make the questions as straight-forward as possible, there is still plenty of room for different interpretations, especially where budget data is concerned. In addition, please bear in mind that our publishing of this data should not be construed as approving any or all of the billing, rate structures, or staffing levels shown. It only shows what the current practices and procedures are in the surveyed communities. Use it with discretion.

For Further Info

If you have additional questions regarding the data or the survey in general, please feel free to contact me by mail, e-mail, or phone (see below). I hope to be updating this survey again in three to four years, and look forward to your continued cooperation and support.

Once again, thanks.

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