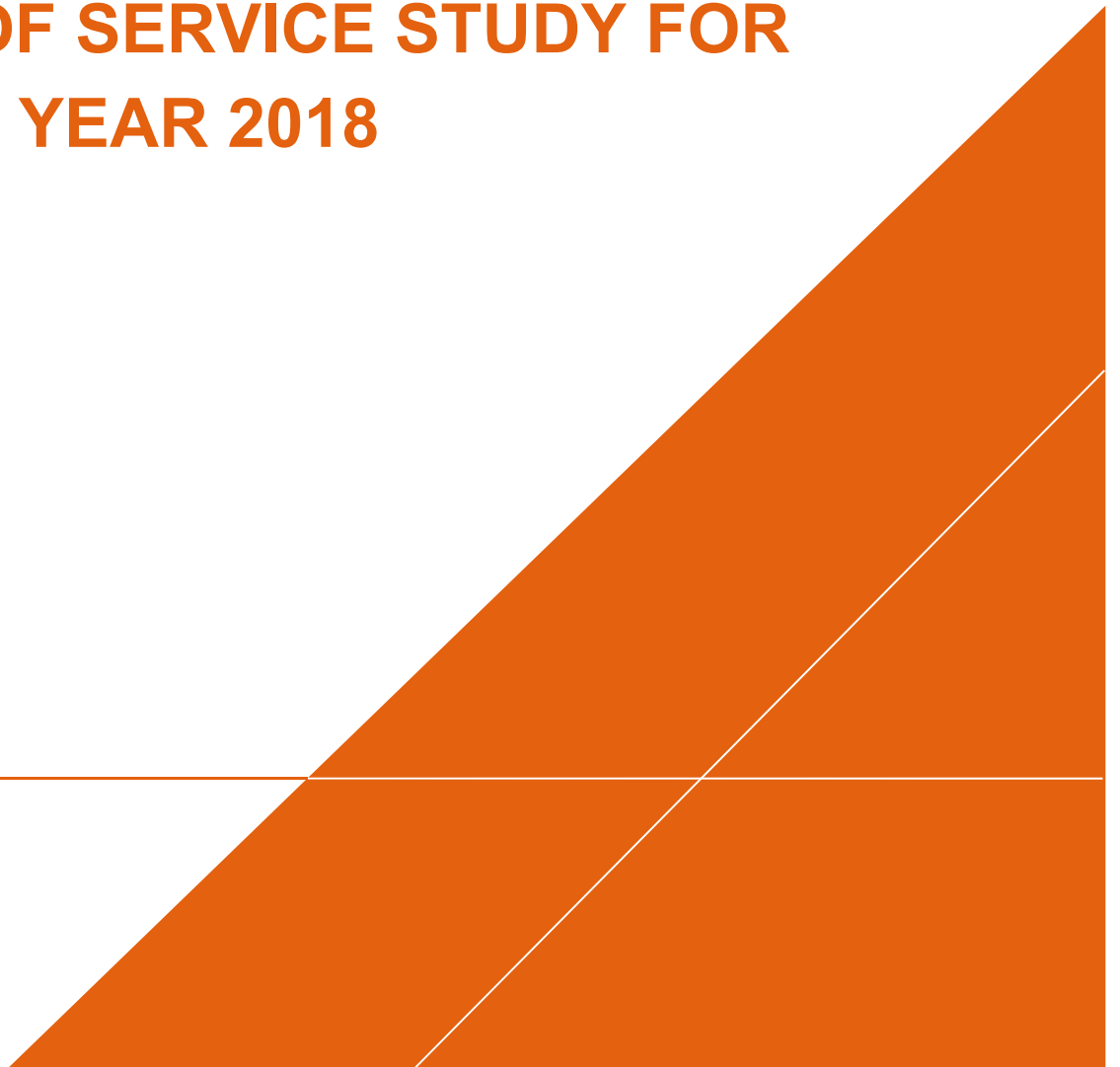




Greater New Haven Water Pollution Control Authority

COST OF SERVICE STUDY FOR FISCAL YEAR 2018

April 7, 2017



COST OF SERVICE STUDY FOR FISCAL YEAR 2018

Prepared for:

Greater New Haven Water Pollution Control
Authority

260 East Street

New Haven, CT 06511

Prepared by:

Arcadis U.S., Inc.
O'Neil Accounting & Consulting, LLC

Our Ref.:

05654066.0000

Date:

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ACRONYMS AND ABBREVIATIONS

CCF	One hundred cubic feet
CGS	Connecticut General Statutes
CSO	Combined sewer overflow
CWF	Clean Water Fund
FYxx	Fiscal year ended June 30, 20xx
GNHWPCA	Greater New Haven Water Pollution Control Authority
IFO	Interim Funding Obligation
MGD	Million gallons per day (flow volume)
MGH	Million gallons per hour (flow volume)
O&M	Operation and maintenance
PLO	Permanent Loan Obligation
RWA	South Central Connecticut Regional Water Authority

1 INTRODUCTION

1.1 Background

The Greater New Haven Water Pollution Control Authority (“GNHWPCA”) was created in 2005 to provide sewage collection and treatment service to customers in the City of New Haven and the Towns of Hamden, East Haven and Woodbridge (the “Constituent Municipalities”) and wholesale treatment service to the towns of North Haven and North Branford via interlocal agreements. Prior to creation of the GNHWPCA in 2005, the utility was owned and operated by the City of New Haven’s Water Pollution Control Authority.

The GNHWPCA is organized in accordance with Connecticut General Statutes (“CGS”) §§22a-500 to 519 inclusive (the “Act”). The purpose of the GNHWPCA is to further the environmental protection laws of the State of Connecticut and to gain efficiencies and economies of scale with respect to the planning, design, construction, management, operation and maintenance of the regional wastewater system. Since acquiring the utility, the GNHWPCA has been providing quality and affordable wastewater services to its customers.

The GNHWPCA was created to (a) operate the wastewater treatment plant and to (b) use, equip, re-equip, repair, maintain, supervise, manage, operate and perform any act pertinent to the collection, transportation, treatment and disposal of sewage with respect to the Constituent Municipalities. Currently, the daily flow at the treatment plant is approximately 29 million gallons per day (“MGD”). The treatment plant has an average daily design flow capacity of 40 MGD and currently provides primary and secondary treatment for all wastewater influent up to 60 MGD. During high flow events, all flow receives primary treatment; however, flow exceeding 60 MGD bypasses secondary treatment but receives disinfection along with the secondary effluent prior to discharge. The treatment plant provides the following unit processes: screening and grit removal, raw waste pumping, three primary clarifiers, four aeration trains, eight secondary clarifiers, gravity thickeners and chlorine disinfection prior to discharge. Thickened sludge is delivered to the on-site sewage sludge incinerator for processing.

The maintenance of the treatment plant and collection system is performed under contract by New Haven Residuals, LP (“Synagro”). Synagro is also responsible (under a separate agreement) for sludge receipt and disposal including operation and maintenance of the sludge incinerator at the East Shore Treatment Plant.

1.2 Objective and Scope

In accordance with §42 of the GNHWPCA’s ordinance (the “Sewer Ordinance”) the Executive Director will ensure that a cost of service study is performed at least annually. The objective of the cost of service study is to produce a schedule of recommended user rates and charges for the customers of the GNHWPCA’s system which will be sufficient to meet the anticipated costs of operating the sanitary sewer system for the upcoming fiscal year.

The Cost of Service Study shall include:

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- A review and evaluation of the proposed expense budget for the upcoming fiscal year, and preparation of cost estimates for the succeeding four fiscal years based on the Executive Director's cost estimates.
- A review and evaluation of the proposed revenue budget for the upcoming fiscal year, and preparation of revenue estimates for the succeeding four fiscal years based on the Executive Director's revenue estimates.
- Determination of the projected revenue requirement from user rates for the upcoming fiscal year and the succeeding four fiscal years.
- Development of a schedule of recommended rates and charges sufficient to support the estimated annual revenue requirements from user rates for the upcoming fiscal year and the succeeding four fiscal years.
- Analysis of the GNHWPCA's historical collection rate, including the current fiscal year and the Executive Director's estimate of the collection rate for the upcoming fiscal year.
- Preparation of a report documenting recommendations, assumptions and methodology.
- Such other information as required by the Executive Director from time to time.

The Executive Director shall review the results and submit the cost of service study to the GNHWPCA Board of Directors on or before the third Monday in April.

1.3 Sewer Ordinance

The GNHWPCA's ordinance governs the operation, maintenance and expansion of the regional wastewater system. In order to guarantee consolidated operation, maintenance and expansion of the regional wastewater system by the GNHWPCA, the Sewer Ordinance also acted to repeal similar ordinances of the Constituent Municipalities which previously served to govern operation, maintenance and expansion of their individual wastewater systems. Material provisions of the Sewer Ordinance that affect this study are detailed in the sections which follow.

1.3.1 Assessment of Benefits; Benefit Charge

Pursuant to provisions contained in the Act, the GNHWPCA may levy and collect benefit assessments upon the lands and buildings within its jurisdiction, which, in its judgment, are especially benefited by a sanitary sewer, according to such rules as the GNHWPCA may adopt. No assessment shall be made until after a public hearing before the GNHWPCA, at which time the owner of the property to be assessed shall have an opportunity to be heard concerning the proposed assessment.

Assessments, including any installment thereof, are due and payable at such time as fixed by the GNHWPCA, provided no assessment shall become due until the work, or particular portion thereof for which such assessment was levied, has been completed. Any assessment of benefits, including any installment thereof, which is not paid within 30 days after the due date, is considered delinquent and will be subject to interest and will constitute a lien upon the property assessed and a charge upon the owner thereof.

1.3.2 Rates Established

Charges for sanitary sewer services furnished by the GNHWPCA for residential, commercial, industrial and institutional users are to be established and revised from time to time by the GNHWPCA. Sewer use charges are to reflect a proportional distribution of costs among all users in accordance with the Act, and Chapter 103 of the Connecticut General Statutes, as amended.

1.3.3 Rates for Property Located Outside the GNHWPCA's Service Territory

The charges to be made by the GNHWPCA for sewer service to property outside the limits of the GNHWPCA's service territory are to be established on the basis of a formal contract with the GNHWPCA, and billed directly to such customers.

1.3.4 No Reduced Rates or Free Service Permitted

All persons owning, renting, leasing or having management or control of property or premises that produce waste that is discharged into the regional wastewater system, including domestic waste, and subject to the provisions of the Sewer Ordinance, shall be charged the rates established by the GNHWPCA, and no reduced rates or free sanitary sewer services are to be furnished to any such person, property or premises.

1.3.5 Billing and Collection

Billing for sewer services is made to the GNHWPCA's customers monthly or quarterly. All sewer user charges are due and payable in full on receipt. Any charges not paid in full within 30 days of the billing date are considered delinquent and bear interest from the due date at the rate provided pursuant to CGS for delinquent property taxes.

1.3.6 Cost of Service Study; Proposed Rates

The Executive Director of the GNHWPCA is to ensure that a cost of service study is performed at least annually. The Executive Director reviews the results of the study and shall submit the study on or before the third Monday in April to the GNHWPCA Board of Directors for consideration and public hearing. If the Executive Director's recommendations as to the proposed rates and charges are not disapproved, or approved with modifications by the GNHWPCA Board of Directors by the first day of the next fiscal year, the Executive Director's recommended rates and charges will automatically become effective until such time as they are superseded by a renewal of the above procedure. Billings for services are to be rendered as the GNHWPCA determines. In the period intervening between cost of service studies, the GNHWPCA may amend user charges so long as such charges are based upon the anticipated cost of operating the system and such charges are presented to the general public at a public hearing in accordance with CGS.

2 GNHWPCA SYSTEM & CUSTOMERS

2.1 Regional System Profile

Wastewater treated by the GNHWPCA at the wastewater treatment plant is discharged into Long Island Sound and must meet both federal and state effluent quality standards. The GNHWPCA was organized to ensure the necessary professional technical and skilled personnel, specialized facilities and equipment, and financial resources are available to allow it to carry out its mission: “To provide reliable municipal wastewater services in compliance with applicable laws, in a cost efficient and effective method, and with the intent and desire to protect the environment and public health of the constituent municipalities.” Furthermore, its operations are expected to be financially self-sufficient.

The wastewater systems of the Constituent Municipalities include any device, equipment, appurtenance, plant facility and method for receiving, collecting, transporting, reducing, treating, reclaiming, disposing, separating or discharging sewage or the residue from the treatment of sewage. The wastewater systems may also include the purchase and/or lease of real estate and improvements thereto deemed necessary or desirable by the GNHWPCA for the purpose of establishing and providing wastewater management and water pollution control services.

Table 2-1 presents a brief summary of the wastewater systems of the GNHWPCA.

Table 2-1. Summary of GNHWPCA Wastewater System

Service Area	53,000 acres
Treatment Plant Capacity	40 mgd
Average Daily Flow	29 mgd
Pump Stations	30
Siphons	8
Sewer Collection System	510 miles
Combined Sanitary/Storm Sewers	50 miles
Manholes	14,300

Source: GNHWPCA management.

2.2 GNHWPCA Customer Base

The total number of sewer service connections (customers) is approximately 47,900 based upon information from the GNHWPCA’s customer billing system. According to 2015 Connecticut Department of Public Health data, the total population of the Constituent Municipalities was approximately 230,000. It is estimated that approximately 201,000 residents within the Constituent Municipalities currently receive

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sewer service from the GNHWPCA. Through interlocal agreements between the GNHWPCA and the towns of North Branford and North Haven, an additional population of approximately 1,500 is served by the GNHWPCA. As illustrated in Table 2-2, the City of New Haven is the largest Constituent Municipality representing approximately 60 percent of the population served.

Table 2-2. Constituent Municipality Customers Served

Municipality	Population Served	/----- Active Customer Accounts¹ -----/				Total
		Residential	Commercial	Industrial	Public Auth.	
New Haven	124,000	20,647	1,999	68	187	22,901
Hamden	50,000	13,603	784	34	37	14,458
East Haven	26,000	9,912	273	7	23	10,215
Woodbridge	1,000	292	77	-	3	372
Total	201,000	44,454	3,133	109	250	47,946

(1) GNHWPCA Customer Information System (CIS) data as of December 2016.

The customer base served by the GNHWPCA consists of a diverse mix of residential and commercial customers. Customers are classified according to the nature of their use of water as well as their property ownership classification, since billing is conducted based on property ownership. Single and multifamily homes and apartment buildings are classified as “residential”, manufacturing enterprises in which water is used as part of the manufacturing process are classified as “industrial”, business and institutional enterprises other than those classified industrial are classified as “commercial” and municipal and other government agencies are classified as “public authority”. It is important to note that in some instances there is a discrepancy between the nature of the water use and the property classification. For example, the New Haven Housing Authority is a public authority responsible for numerous residential households. The GNHWPCA classifies this customer as a public authority.

2.3 Organization & Management

2.3.1 Governance

The business of the GNHWPCA is managed by or under the direction of a Board of Directors, which may exercise all such powers of the GNHWPCA and perform all such lawful acts and activities as are allowed by the Connecticut General Statutes, as amended, and by its bylaws and ordinances.

According to provisions of the Sewer Ordinance and Section 2.2 of its bylaws, the GNHWPCA is to be governed by a qualified Board of Directors, comprised as follows:

The GNHWPCA has nine (9) Directors, each of whom shall have one vote. Four (4) Directors have been appointed from New Haven by the Mayor of New Haven, with the approval of the Board of Aldermen of New Haven. Two (2) Directors have been appointed from East Haven by the Mayor of East Haven, with the approval of the Town Council of East Haven. Two (2) Directors have been appointed from Hamden by the Mayor of Hamden, with the approval of the Town Council of

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Hamden. One Director has been appointed from Woodbridge by the First Selectman of Woodbridge, with the approval of the Board of Selectmen of Woodbridge.

The Directors are appointed for three year staggered terms as outlined in detail in the bylaws and ordinance. In any single year, no more than four (4) Directors' terms are scheduled to expire at one time, thereby designed to institutionalize a continuity of governance.

All business of the GNHWPCA is managed and directed by the Board of Directors, as allowed by CGS and the GNHWPCA's bylaws.

The GNHWPCA's bylaws may be revised by the affirmative vote of no less than two-thirds of the Directors in accordance with CGS §22a-501(a) (1), as amended. However, the bylaws provide that any amendment to include new constituent municipalities shall require a unanimous affirmative vote of the Board of Directors.

The current membership of the Board is as follows:

Table 2-3. Current Board of Directors

Name/Title	Appointed By	Term Expires
Russell N. Cyr, Director	Hamden	12/31/17
Robert Nastro, Director	East Haven	12/31/17
Robert Falcigno, Director	East Haven	12/31/18
Jeffrey D. Ginzberg, Director	Woodbridge	12/31/18
Michael Fimiani, Director	New Haven	12/31/18
Stephen A. Mongillo, Chairman	Hamden	12/31/19
Joyce Alton, Director	New Haven	12/31/19
Clayton Williams, Director	New Haven	12/31/19
Alphonse Paolillo, Jr., Vice Chairman	New Haven	12/31/19

According to the bylaws, a majority vote of the Directors is required to approve all business transactions of the GNHWPCA. Certain matters, such as entering into an agreement with respect to the distribution of rights and properties of the GNHWPCA upon the termination of its corporate existence, entering into or approving any sludge agreement, entering into any inter-local agreement, entering into any agreement with respect to the sale or lease of assets of the GNHWPCA which would leave the GNHWPCA without a significant continuing business activity, removal of a Director, awarding of a contract by negotiation without public bidding; amending, modifying, restating or replacing the Sewer Ordinance, and increasing the permitted processing capacity of the GNHWPCA's treatment plant, each would require a 2/3rds vote of the Directors.

The Board establishes insurance, health care, retirement, and other employee benefits as it deems necessary and convenient for the effective administration of the GNHWPCA. Key management positions are designed in each functional area under the major divisions of Executive Director, Finance and Administration, Engineering and Operations to address the operation, maintenance and management of the regional wastewater system by the GNHWPCA.

2.3.2 Management and Staff

The GNHWPCA is headed by an Executive Director, who is responsible for all technical and administrative operations of the GNHWPCA and the implementation of programs, policies and procedures at the direction of the Board. Key management staff members are as follows:

Sidney Holbrook, Executive Director. Mr. Holbrook is the Executive Director of the GNHWPCA. He has more than 30 years of wastewater, environmental and public management experience. Mr. Holbrook has served as the Executive Director of the GNHWPCA since 2009. Prior to this position, he owned and operated the Monoflo Septic Tank Co., Inc. in Westbrook, Connecticut and was the principal of SJH Associates which provided Environmental Consulting Services. Mr. Holbrook also served as Governor John Rowland's Chief of Staff from 1997 to 2002, directly overseeing sixteen State agencies including the Department of Environmental Protection, Department of Transportation, Department of Public Health and Department of Social Services. Prior to his tenure as Chief of Staff, Mr. Holbrook served as the Commissioner of the Department of Environmental Protection. On May 10, 2011, Mr. Holbrook was recognized by the National Association of Clean Water Agencies in Washington, D.C. with a Public Service Award for his dedication to Environmental Stewardship. As Executive Director, his responsibilities include managing and directing all administrative, operational and financial activities and programs of the GNHWPCA.

Gabriel Varca, CPA, Treasurer/Director of Finance and Administration. Mr. Varca is the Treasurer and Director of Finance and Administration. For over 25 years, Mr. Varca has held various operations and management positions with the New Haven Water Pollution Control Authority ("NHWPCA") and the GNHWPCA. He assists the Executive Director in the creation of the operating budget and capital improvement plan budget and is responsible for the administrative and financial operations of the GNHWPCA, including accounting, finance, billing and collections. Mr. Varca has a Class III Wastewater Operators License from the Connecticut Department of Energy & Environmental Protection and he earned a B.S. in Accounting from Southern Connecticut State University.

Gary Zrelak, Director of Operations. Mr. Zrelak is the Director of Operations. He has over 30 years of experience in wastewater operations. His responsibilities include supervising and managing the performance of the GNHWPCA's contract operator for the water pollution control facilities, sanitary sewer collection systems and pumping stations within State and Federal regulations. Prior to his employment by the Authority, Mr. Zrelak was the Process Control Superintendent for the NHWPCA for more than seven years. Mr. Zrelak earned a B.S. in Agronomy from the University of Connecticut and a M.S. Degree in Environmental Science from the University of New Haven. He also holds a Class IV Wastewater Operators License from the Connecticut Department of Energy & Environmental Protection and a Class IV Collection Systems License from the New England Water Pollution Control Association.

Thomas Sgroi, P.E., Director of Engineering. Mr. Sgroi is the Director of Engineering for the GNHWPCA. Mr. Sgroi has over 25 years of engineering and construction management experience. His

responsibilities include completion of executive management work for the Authority's planning and engineering programs, which include design, construction, utility services, GIS, mapping, records management and capital improvement projects. Mr. Sgroi earned a B.S. in Civil Engineering from the University of Hartford. He is also a Licensed Professional Engineer in the State of Connecticut.

An organization chart is included as Exhibit 6.

2.3.3 Contracted Services

2.3.3.1 Maintenance Services Agreement

The GNHWPCA executed a 15 year Maintenance Services Agreement with New Haven Residuals, LP ("Synagro") dated September 30, 2013. The comprehensive agreement with Synagro provides for the maintenance of the East Shore Treatment Plant and pump stations. This agreement establishes performance and reporting requirements for the maintenance of the system, and requires the implementation of a maintenance management program to include preventive, predictive, and corrective maintenance for all components of the system.

The agreement provides for payment of a service fee to Synagro consisting of the following components:

- A fixed component of \$1,930,000 (2014 dollars, adjusted annually);
- Reimbursement for expenditures for maintenance, major repairs, capital projects and outside services up to a defined Project Expense Limit of \$1,100,000 (2014 dollars, adjusted annually). Amounts expended by Synagro in excess of the limit are paid by the GNHWPCA, subject to a markup; and
- 50% of the revenues collected by the GNHWPCA from the Fats, Oils and Greases (i.e., "FOG") facility.

The GNHWPCA is responsible for all utility costs except for natural gas for the maintenance building.

2.3.3.2 Solids Handling Agreement

The GNHWPCA currently also contracts with Synagro for sludge receipt and disposal, including operation and maintenance of the sludge incinerator at the East Shore Treatment Plant under the terms of an agreement that amends and restates the original August 17, 1995 agreement. The September 2014 agreement has an initial term of 10 years and includes two five-year renewal options. The agreement provides for GNHWPCA payment of a service fee to Synagro per dry ton of sludge processed. Synagro, is responsible for reimbursing the GNHWPCA for the cost of all utilities, except water, associated with the specified services. The service fee per dry ton was fixed at the outset of the agreement, and is subject to annual adjustments for inflation.

Under the agreement, Synagro is allowed to solicit sludge from other entities (outside sludge) to maximize the efficiency of the on-site incinerator. Synagro is required to pay a royalty of \$35 per dry ton of outside sludge processed, to a Sinking Fund. The GNHWPCA matches all such payments into the Sinking Fund with such combined contributions to be used for any capital projects that exceed a cost of \$20,000. Synagro maintains responsibility for all capital projects costing less than \$20,000. As of July 1,

2016, Synagro is responsible for any capital projects costing less than \$50,000, and the GNHWPCA is no longer required to contribute to the Sinking Fund.

Individuals providing services under the maintenance and solids handling contracts are employees of Synagro, not the GNHWPCA. Synagro, maintains 25 staff positions, 13 of which are dedicated wastewater treatment maintenance staff. Currently the staff of the GNHWPCA consists of 64 full- and part-time employees. An organization chart is included as Exhibit 6.

2.3.4 Powers of the GNHWPCA

The GNHWPCA has the power to set rates, bill customers and take appropriate action for collection of delinquent accounts. The GNHWPCA is a regional water pollution control authority formed in accordance with CGS §§22a-500 to 519, which provides powers of municipalities to the GNHWPCA. CGS §22a-501 sets forth in greater detail the powers of a regional water pollution control authority to set rates.

2.3.4.1 Cost Allocation

The goal of the GNHWPCA is to maintain a uniform blended rate for all Constituent Municipalities. This study is being conducted to develop a schedule of recommended sewer user rates sufficient to support the estimated cost of service to all users in the regional wastewater system.

2.3.4.2 Procedures for Establishing Rates and Charges

The GNHWPCA is empowered to establish and impose just and equitable fees, rates, charges, and penalties and levy assessments of property benefited by the wastewater system for any services it performs. The Board of Directors is responsible for approval of all fees, rates, charges and penalties. Rates are based on metered water flow use and billed directly to the user on a quarterly basis unless otherwise specified.

Rates are determined based on the proposed budget and the annual cost of service study, to be considered by the GNHWPCA and the general public and noticed in accordance with state statutes and applicable ordinances and by-laws.

Such charges are to reflect a proportional distribution of costs among all users in accordance with CGS §7-255, as amended from time to time, §204(b) of 33 USC, Section 1284(b) and the Act. No reduced rates or free service are to be permitted. Prior to the establishment of a fee, rate, charge, penalty or assessment, the Board of Directors must hold a public hearing at which all users of the wastewater system will have had an opportunity to be heard concerning any such proposed fee, rate, charge, penalty or assessment.

2.3.4.3 Budget Approval

In accordance with CGS §§22a-500 to 519, and the Sewer Ordinance, the GNHWPCA must ensure a cost of service study is conducted at least annually. The study is to be reviewed by the Executive Director and submitted each year with a schedule of recommended rates and charges for the next fiscal year. In the period intervening cost of service studies, the GNHWPCA is authorized to amend user

charges provided such charges are based upon the anticipated cost of operating the system and are presented at a public hearing, properly noticed.

The annual budget of the next fiscal year's projected revenue and expenditures and recommended sewer user charges are to be submitted to the Board of Directors and filed with the City/Town Clerks in the City of New Haven and Towns of East Haven, Hamden, and Woodbridge by the Executive Director on or before the third Monday in April and, within ten calendar days after such submission, are to be published once in a daily newspaper having circulation in the City of New Haven and Towns of East Haven, Hamden, and Woodbridge. After such publication, but no earlier than ten calendar days after public notice thereof, the GNHWPCA is to hold a public hearing on such projected revenue and expenditures and recommended sewer user charges and consider and act on such projected revenues and expenditures and recommended sewer user charges on or before the first Monday in June.

The Executive Director is required to submit one copy of the annual operating budget of the GNHWPCA to the State of Connecticut Office of Policy and Management by July 1st of each year or within thirty calendar days after the adoption of the budget, whichever is later (CGS §22a-502.). The budget and sewer use charge, if said charge is revised by the GNHWPCA, shall be filed with the City/Town Clerks and published in a daily newspaper having circulation in the City of New Haven and Towns of East Haven, Hamden, and Woodbridge no later than five calendar days after their filing.

2.3.5 Billing & Collection

All billing and collection is coordinated through the Customer Service Department of the GNHWPCA. The costs associated with the GNHWPCA's billing and collection activities and certain of its administrative and accounting costs are recovered through an administrative charge applied to each bill. The GNHWPCA estimates it will produce approximately 194,600 bills in FY18.

2.3.5.1 Billing Procedures

Customers of the GNHWPCA are classified according to the nature of their water consumption. All homes, dormitories and apartment buildings are classified as residential, all manufacturing enterprises in which water is used as part of the manufacturing process are classified as industrial, and all business and institutional enterprises other than those classified industrial are classified as commercial. Municipal and other public entities are classified as public authority. The wastewater customers are billed for wastewater services based on their metered water consumption, as determined by the South Central Connecticut Regional Water Authority ("RWA").

In general, customers are billed on a quarterly basis. Approximately 370 (primarily large volume) customers are billed on a monthly basis. The billings to the approximately 23,000 customers in New Haven takes place in July, October, January and April. The billings to the approximately 25,000 customers in East Haven, Hamden and Woodbridge takes place in August, November, February and May.

Key provisions of the GNHWPCA's billing and collections policy include:

- Bills not paid within 30 days from the billing date are subject to interest at a rate of 1.5 percent per month from the dated billed.

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- A delinquent account is sent to a collection agency after the amount owed is \$90 or greater than 90 days old.
- When an account is sent for collection, the collection fee is added to the bill of the delinquent customer for reimbursement.
- Payments not received continue for further collection procedures under tax warrant or foreclosure proceedings.

The GNHWPCA implemented a new Customer Account Portal in January 2015. The portal gives customers who enroll the ability to view account information including billing history and transaction history, and to receive their bills electronically. The new system also enhances online bill payment options. Now customers have the ability to pay their accounts online or by phone using echeck, or credit/debit cards. Another new feature is the ability for customers to enroll in the “Auto Pay” option whereby payment will automatically be drawn from the specified account on file on the due date of the bill.

Customers still have the choice of paying by mail, in person (check only) or by using Checkfree payment services from Fiserv, Inc., which allows customers to pay their bills at several retail chains throughout the service area.

3 FINANCIAL MANAGEMENT

3.1 Introduction

In accordance with CGS §§55b-111 to 112, the GNHWPCA operates as a municipality for the purpose of compliance with auditing and finance requirements. The GNHWPCA can establish eligibility to apply for financing from the Clean Water Fund under the provisions of CGS §§22a-477 to 483. Clean Water Fund notes and tax-exempt revenue bond issues serve as the primary capital funding mechanism for the GNHWPCA. The notes and bonds are issued to fund capital improvements periodically, depending on the GNHWPCA's capital requirements. The issuance of the bonds is in accordance with the requirements and provisions of CGS §22a-507.

The Board of Directors has adopted revised and updated financial management policies. These policies formalize and codify many policies developed and adopted since the inception of the GHNWPCA. The policies address the following areas:

- Governance Philosophy;
- Budgeting and Capital Planning;
- Rate-Setting Policy;
- Financing Policies (Swaps, Term, Variable/Fixed, Useful Lives);
- Maintenance of Reserves;
- Debt Service Coverage and Pay-As-You-Go Capital Funding;
- Investment of Operating Funds and Cash Management; and
- Collection Practices

3.2 Rate Covenants

At its inception, the GNHWPCA issued \$91,290,000 in revenue bonds (Series 2005A) to purchase system assets, refund existing debt and fund reserves. The rate covenant entered into in conjunction with these bonds (and those issued subsequently), and the ability to raise rates are the primary factors that provide the GNHWPCA with credit strength. As is the case with most utility financing, the GNHWPCA has entered rate covenants requiring management to set rates for service that will generate net revenues sufficient to provide a defined minimum level of cash flow in excess of debt service requirements. The Indenture of Trust for the GNHWPCA's bonds (the "Indenture") requires debt service coverage of 115% (i.e., excess cash flows equal to 15% of debt service must be incorporated into sewer rates). In addition, rates must cover operating and maintenance expenses, and contributions to reserve funds for future system improvements, expansions, or replacements. Sufficient revenues, or reserves, should also be available for unexpected emergencies such as flood damage or sewer main breaks.

Pursuant to the Indenture, the GNHWPCA covenants that it will fix, charge and collect rates, charges, rents, fees and assessments, including but not limited to use and connection charges and benefit

COST OF SERVICE STUDY FOR FISCAL YEAR 2018

assessments, which will produce revenues which shall be sufficient in each fiscal year to provide for the following:

- A debt service coverage ratio of at least 115% of the debt service cash requirements;
- Any amount necessary to restore any account within a debt service reserve fund to its required deposit level; and
- Any amount necessary to restore any debt service reserve fund for parity indebtedness to its required deposit level.

For purposes of calculating debt service coverage pursuant to the Indenture, it is also necessary to incorporate reimbursements from the City of New Haven for its share of principal payments on Clean Water Fund (“CWF”) notes related to sewer-separation projects. The GNHWPCA has established a receivable for the total that will be reimbursed by the City.

Table 3-1 below details the debt service coverage provided for the years ended June 30, 2012 through 2016.

Table 3-1. Debt Service Coverage Calculation

	<u>FY12</u>	<u>FY13</u>	<u>FY14</u>	<u>FY15</u>	<u>FY16</u>
Cash Flows from User Charges					
Total operating revenues	\$ 35,157,176	\$ 37,233,851	\$ 38,917,015	\$ 39,793,629	\$ 39,696,664
Depreciation	4,498,847	4,579,995	5,260,461	5,353,000	5,554,392
Total operating expenses	(25,640,527)	(25,799,261)	(27,454,762)	(28,531,672)	(29,683,864)
Interest income	278,166	281,048	290,318	299,126	313,479
Reimbursement - New Haven CWF interest	173,873	180,128	189,660	196,035	179,337
Reimbursement - New Haven CWF principal	1,006,880	773,908	899,396	866,814	848,863
Net cash flows from user charges	15,474,415	17,249,669	18,102,088	17,976,932	16,908,871
Debt Service					
Principal payments on debt	5,197,046	4,716,452	5,574,436	7,003,463	5,711,464
Interest paid on debt	5,556,261	4,898,225	5,249,380	2,099,029	4,185,932
Total debt service payments	10,753,307	9,614,677	10,823,816	9,102,492	9,897,396
Debt service coverage ratio	1.44	1.79	1.67	1.97	1.71

Source: GNHWPCA audited financial statements.

The GNHWPCA has provided a covenant that each fiscal year, it will budget for rates, charges, rents, fees and assessments, including but not limited to use and connection charges and benefit assessments, which will produce revenues which, together with amounts capitalized from proceeds of bonds or otherwise made available and reserved and not already taken into account by reduction of the obligations which are to be paid from revenues and the amount to be withdrawn from a surplus fund other than to pay capital costs for such fiscal year, will be sufficient in each fiscal year to provide for an amount equal to 100% of the aggregate debt service for such fiscal year with respect to subordinated indebtedness.

3.3 Reserve Accounts

A fully funded debt service reserve account provides an additional level of security for bondholders. When an unexpected budget shortfall occurs, the reserve fund will allow the GNHWPCA time to implement necessary adjustments before bondholders are adversely affected. The usual debt service reserve requirement is equal to the least of 125% of average annual debt service, 10% of aggregate bond debt service, or maximum annual debt service. A fully funded debt service reserve has an impact on the GNHWPCA's rating and may be essential for an investment grade rating. However, it is also understood that the debt service reserve is really a liquidity source and provides only limited additional security to bondholders.

Reserve accounts totaling approximately \$14.5 million were funded by the GNHWPCA's initial bond issuance. They included a General Fund (operating reserves and funds identified to meet debt service coverage requirements), Clean Water Fund Debt Service Reserves (50% of maximum aggregate annual debt service on CWF notes, now two months' debt service) and the Debt Service Reserve Fund (100% of maximum aggregate annual debt service on revenue bonds). For utilities that consistently maintain high operating reserves and sustain high debt service coverage levels, the debt service reserve fund may be less relevant.

The GNHWPCA has established an Infrastructure Renewal Fund, which is used to accumulate reserves to fund ongoing capital projects in lieu of borrowing. This program is funded primarily from the annual cash flow generated by the debt service coverage requirement.

Consistent with prevailing credit rating criteria and its plan of operations, it is assumed that the GNHWPCA will consider the following factors when developing and managing its credit structure:

- **System Size and Assessment Base.** Since the GNHWPCA serves a diverse customer base already, it will seek expansion only when considered to be both operationally and financially appropriate.
- **Governance.** The GNHWPCA's operations are governed in accordance with its bylaws, which provides for the GNHWPCA to establish rates, manage staff, and approve capital improvements, among other responsibilities.
- **Strategic Focus.** The GNHWPCA considers multi-year capital improvement programs that include current and anticipated capital needs that cover asset maintenance, upgrades, and system expansions.
- **Rates, Rate Structure, and Rate Making Flexibility.** The GNHWPCA will evaluate whether rates and revenues cover all financial commitments, inclusive of reserves for emergencies, and whether they are reasonable and affordable, which could affect asset maintenance and expansion of the user base.
- **Additional Considerations.** The GNHWPCA is seeking to build reserve balances over time to establish reliable operating reserves and fund an appropriate share of the ongoing capital improvements from operating funds.

The GNHWPCA is intent on establishing the best credit rating it can attain in order to minimize the impact of borrowing costs. The GNHWPCA received ratings in February 2016 as follows:

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- Standard & Poor's – AA/Stable
- Moody's – A1
- Fitch – A+

4 DETERMINATION OF RATES

4.1 Scope and Methodology

In providing adequate wastewater treatment services to its customers, the GNHWPCA must receive sufficient total revenue to ensure the following objectives:

- Meet legal and contractual requirements, including the terms of the Indenture;
- Maintain current service levels;
- Meet new demands for service;
- Adequately maintain the existing collection and treatment systems; and
- Plan for future needs in an orderly manner.

Regulations established by the U.S. Environmental Protection Agency and Connecticut Department of Energy & Environmental Protection require user fee systems for pollution abatement facilities to produce revenues sufficient to support the operations, maintenance and replacement of facilities. This is the key element in the determination of the rates to be charged to users, since it is intended that the operation of such facilities should be self-supporting. The State and Federal governments have mandated that the viability of such operations should not be compromised. Accordingly, sewer user rates should be set at levels sufficient to recover all costs necessary to finance adequate wastewater treatment and disposal.

4.2 Cost Projections and Determination of Revenue Requirement

The first step to developing appropriate rates is to determine the costs associated with planned future operations. Based on these cost projections and any projected miscellaneous revenues (other than those that will be generated from rates), an annual revenue requirement is established. This represents the amount that must be generated from sewer user charges.

For purposes of this study, the total cost estimates used for FY18 through FY22 were based upon the proposed operating budget for FY18, historical and anticipated trends, and a review of individual budget line-items. The average annual growth rate of costs was developed by management based upon projected needs and historical experience. We also considered those developments in the current year that may affect cost estimates on a significant scale going forward.

This cost of service study incorporates the following cost components:

4.2.1 Operations and Maintenance Costs

Operations and maintenance costs include all costs necessary to deliver wastewater collection and treatment services. It includes not only the technical operation of the plant facilities and collection system, but also the administrative resources employed to ensure efficient operations as well as fixed administrative resources employed to administer the GNHWPCA.

4.2.2 Debt Service

In recognizing costs, cash outlay is the determinant used for cost recovery. Rather than using depreciation, the debt service requirement resulting from the acquisition and construction of assets is used. According to EPA guidelines on establishing cost recovery systems, this is an acceptable method for recognizing costs. Therefore, principal and interest payments are among the costs to be recovered by user fees. Exhibit 4 details the debt service costs for FY18 through FY22.

4.2.3 Estimated Future Debt Service

The cost estimates include a provision for estimated debt service associated with future bond issues to finance planned capital improvements. Based on the GNHWPCA's capital improvement plan for FY18 through FY22 (see Exhibit 5), we have estimated future debt service using the following assumptions:

- Management's assessment of the portion of costs to be financed by Clean Water Fund grants and notes.
- Management's assessment of the project costs that will be shared with the City of New Haven (i.e., 40% of each sewer separation project).
- Revenue bonds to be issued periodically, at a rate of 5% for 30 years, and amortization with level payments.
- Projects financed with Clean Water Fund notes are financed with an Interim Funding Obligation (IFO) until project completion. At completion, IFO's convert to Permanent Loan Obligations (PLO) with payment of 5% of principal outstanding and amortization of the remaining balance over 20 years at 2% with level payments. Interest accrued prior to conversion to PLO is assumed to be included in the amount borrowed under the IFO.
- For purposes of this study, based on management's capital improvement plan, we have assumed the timing and amount of future borrowings as follows:
 - Issuance of \$10,000,000 of new revenue bonds in FY20 for system upgrades.
 - CSO Projects – Shared with the City of New Haven
 - Amortization of a PLO of \$6,000,000 in June 2022 (Project 2012-04: Yale/Trumbull Phase 2B);
 - Amortization of a PLO of \$1,250,000 in June 2022 (Project 2016-03: West River CSO Improvements);
 - Non-CSO Projects
 - Amortization of a PLO of \$43,814,332 in September 2017 (Project 441-C: Wet Weather Improvements) The GNHWPCA will begin amortizing this issue earlier than required and thereby avoid the need to make the 5% principal payment at the outset;
 - Amortization of a PLO of \$2,700,000 in December 2018 (Project 2016-02: Relief Sewer);

- Amortization of a PLO of \$500,000 in December 2018 (Project 2016-05: Relief Sewer);
- Amortization of a PLO of \$750,000 in December 2018 (Project 2016-07: Green Infrastructure);
- Amortization of a PLO of \$4,700,000 in June 2019 (Project 2016-06: I&I East Haven/Hamden);
- Amortization of a PLO of \$3,400,000 in December 2021 (Project 2019-02: Relief Sewer); and
- Amortization of a PLO of \$17,400,000 in June 2022 (Project 2016-02: East Street Pump Station).

4.2.4 Miscellaneous Revenues

Miscellaneous revenues (i.e., revenues from all sources other than sewer user charges) are deducted from the total cost of services to determine the net revenue requirement. Miscellaneous revenues for FY18 are based on management's proposed budget. The average annual growth rate of revenues was determined by management based upon projected needs and historical experience.

4.2.5 Debt Service Coverage Requirement

As detailed in Section 3.2 of this report, the GNHWPCA is required under the Indenture of Trust for its revenue bonds to include a provision for additional revenues in its user charges equal to 15% of annual debt service. This provision does not apply, however, to the extent that management has identified and restricted existing reserves equal to all or part of this amount that are not otherwise restricted. Notwithstanding this exception, the GNHWPCA includes the full 15% requirement in its budget each year and provides for an offsetting use of reserves as applicable. For FY18, management has proposed user charges that provide additional revenues equal to 20% of annual debt service. We have followed the same approach for purposes of this study.

4.2.6 Use of Debt Service Reserve Funds

Maintenance of debt service reserve funds may increase or reduce the GNHWPCA's revenue requirement in any given year. Management has planned funding and use of reserves FY19 through FY22, which has been incorporated into this study.

4.2.7 Receivable Management Costs

Receivable management costs are the estimated portion of billings to customers each year that are not collected during the period. The GNHWPCA implemented a new customer information system in 2010. Management has been able to utilize the CIS system to monitor billing and collections data on a monthly basis. The GNHWPCA's one-year collection rate has been stable in recent years at approximately 89%. Write-offs are minimal due to GNHWPCA's ability to place liens on real property, and the long-term collection rate on receivables remains above 95%.

4.3 Development and Design of Rates and Charges

4.3.1 Objectives

The primary objective in the recommendation of rates is to establish rates that will generate sufficient revenues to meet the total revenue requirements. Billing is based on water consumption using data provided by the RWA stated in 100 cubic foot units (“CCF’s”). For purposes of recommending a user rate for FY18, we have assumed billable consumption of 8,350,000 CCF based on management’s assessment of consumption trends.

4.3.2 Recommended Rate

As detailed further in Table 4-1, which follows, and in Exhibit 1, based upon our assessment of management’s budgeted revenues and expenses for FY18 and other assumptions detailed herein, we recommend a quarterly administrative fee of \$14.00 and a CCF rate of \$4.36 for FY18.

The administrative fee has not been increased from \$13.00 per quarter since the GNHWPCA was formed in 2005. As it is designed to add stability to rate revenues, and correlate to fixed costs, it is reasonable to increase this charge. Accordingly, we recommend increasing the charge as detailed in Table 4-1 below. Implementing the recommended user rates for FY18 would yield estimated billings from the administrative fee of \$2,724,000, or 7.0% of total rate revenues. Maintaining the \$13.00 administrative fee would yield \$2,530,000 or 6.5% of total rate revenues.

Table 4-1. FY18 Recommended User Rate; FY19 through FY22 Projected Rates

<u>Fiscal Year</u>	<u>Estimated Consumption</u>	<u>Admin Fee</u>	<u>CCF Rate</u>	<u>% Change in CCF Rate</u>	<u>Estimated Billings</u>
FY18	8,350,000	\$ 14.00	\$ 4.36	5.8%	\$ 39,159,000
FY19	8,350,000	14.00	4.59	5.3%	41,078,000
FY20	8,350,000	15.00	4.82	5.0%	43,207,000
FY21	8,350,000	16.00	5.02	4.0%	45,020,000
FY22	8,350,000	17.00	5.28	5.3%	47,450,000

4.3.3 Flat Rates for Well Users

The GNHWPCA currently has sewer customers who are not customers of the RWA (i.e., customers whose water supply is from wells), and therefore have no basis for sewer billing. We recommend that customers of the GNHWPCA, who are not customers of the RWA, continue to be billed on the basis used in previous years. The default consumption for a single family residence that is a well user is 24 CCF per quarter. Non-single family residences and other well users who appeal the default consumption are required to complete a survey that collects information about their dwellings and the inhabitants. The customer is billed a flat amount each quarter based on the survey results. Presently, there are well users who are billed at 15, 20, 24, 48 and 96 CCF’s. The current quarterly billing amount of \$98.88 (plus the administrative fee) for a 24 CCF customer would increase to \$104.64 (plus the administrative fee) under the recommended rate structure for FY18.

4.3.4 Disclaimers

In preparation of this report and the conclusions contained herein, Arcadis and O'Neil Accounting and Consulting, LLC. have relied on assumptions and information provided by the GNHWPCA with respect to conditions which may exist or events which may occur in the future. We have not independently verified the accuracy of the information provided by the GNHWPCA and others. While we believe such sources are reliable and the information obtained to be accurate and appropriate for the analysis undertaken and the conclusions reached herein, as is often the case, there may be differences between actual and projected results, some of the estimates used in this report will not be realized, and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the data and results projected in this report and actual results achieved, and those differences may be material.

In the completion of this cost of service study for the GNHWPCA, Arcadis and O'Neil Accounting and Consulting, LLC. are (a) not recommending any action regarding municipal financial products or the issuance of municipal securities; (b) are not acting as a registered municipal advisor to the GNHWPCA and does not owe a fiduciary duty to the GNHWPCA pursuant to Section 15B of the Securities Exchange Act of 1934, as amended by the Dodd-Frank Wall Street Reform and Consumer Protection Act, with respect to the information and material contained in this report. The GNHWPCA should discuss any information and material prepared in connection with this report with any and all internal or external registered municipal advisors that it deems appropriate before acting on this information and material.

5 EXHIBITS

Exhibits 1 through 6 are found on Pages 5-2 through 5-8.

COST OF SERVICE STUDY FOR FISCAL YEAR 2018

Exhibit 1.

Revenue Requirement and Recommended User Rates

For the Fiscal Year Ended June 30, 2018

With Estimated Revenue Requirements and User Rates for Fiscal Years 2019 through 2022

Line No.	Description	1	2	3	4	5	6	7	8	9
		FY18	% ch.	FY19	% ch.	FY20	% ch.	FY21	% ch.	FY22
A. OPERATIONS & MAINTENANCE										
1	Personnel	\$ 8,764,321	5%	\$ 9,217,000	5%	\$ 9,699,000	5%	\$ 10,215,000	5%	\$ 10,770,000
2	Utilities	4,460,000	2%	4,549,000	2%	4,639,000	2%	4,730,000	2%	4,823,000
3	Plant Operations & Collection System	900,000	3%	927,000	3%	954,000	3%	983,000	3%	1,012,000
4	Contracted Maintenance	2,067,984	3%	2,130,000	3%	2,194,000	3%	2,260,000	3%	2,328,000
5	Contracted Sludge & Ash Disposal	3,157,981	3%	3,253,000	3%	3,351,000	3%	3,452,000	3%	3,556,000
6	Other Contracted Services	5,471,760	3%	5,612,000	3%	5,757,000	3%	5,907,000	3%	6,061,000
7	Payments In-lieu of Taxes (PILOT)	750,000	0%	750,000	0%	750,000	0%	750,000	0%	750,000
8	Equipment, Vehicles & Supplies	1,233,710	3%	1,270,000	3%	1,306,000	3%	1,342,000	3%	1,380,000
9	Plant Repairs & Replacement	1,914,000	3%	1,971,000	3%	2,030,000	3%	2,091,000	3%	2,154,000
10	Contingency	500,000	0%	500,000	0%	500,000	0%	500,000	0%	500,000
11	Total Operations & Maintenance Costs	29,219,756	3%	30,179,000	3%	31,180,000	3%	32,230,000	3%	33,334,000
B. DEBT SERVICE										
Revenue Bonds:										
12	Principal	3,176,667	3%	3,281,667	4%	3,416,667	9%	3,712,667	5%	3,889,667
13	Interest	4,089,798	-3%	3,979,757	2%	4,058,765	3%	4,200,398	-4%	4,022,251
Clean Water Fund Notes:										
14	Principal	4,267,898	24%	5,298,079	-3%	5,140,500	1%	5,192,761	28%	6,661,627
15	Interest	1,259,852	17%	1,469,783	-5%	1,401,586	-7%	1,298,259	15%	1,499,290
16	Total Debt Service	12,794,215	10%	14,029,285	0%	14,017,517	3%	14,404,085	12%	16,072,834
17	TOTAL COST OF SERVICES	\$ 42,013,971	5%	\$ 44,208,285	2%	\$ 45,197,517	3%	\$ 46,634,085	6%	\$ 49,406,834
C. DEBT SERVICE COVERAGE										
18	Debt Service Coverage Requirement	2,559,000	10%	2,806,000	0%	2,804,000	3%	2,881,000	12%	3,215,000
19	Debt Service Coverage Ratio	1.20		1.20		1.20		1.20		1.20
D. MISCELLANEOUS REVENUES										
20	Interest & Lien Fees	(1,395,000)	0%	(1,395,000)	0%	(1,395,000)	0%	(1,395,000)	0%	(1,395,000)
21	Aged Accounts Receivable	(4,350,000)	0%	(4,350,000)	0%	(4,350,000)	0%	(4,350,000)	0%	(4,350,000)
22	Investment Income	(325,000)	0%	(325,000)	0%	(325,000)	0%	(325,000)	0%	(325,000)
23	High Strength Surcharges	(800,000)	0%	(800,000)	0%	(800,000)	0%	(800,000)	0%	(800,000)
24	Grease Disposal	(425,000)	0%	(425,000)	0%	(425,000)	0%	(425,000)	0%	(425,000)
25	Outside Sludge	(250,000)	0%	(250,000)	0%	(250,000)	0%	(250,000)	0%	(250,000)
26	Interlocal Fees	(60,000)	0%	(60,000)	0%	(60,000)	0%	(60,000)	0%	(60,000)
27	Reimbursements - Synagro	(735,000)	0%	(735,000)	0%	(735,000)	0%	(735,000)	0%	(735,000)
28	Other Revenues	(725,000)	0%	(725,000)	0%	(725,000)	0%	(725,000)	0%	(725,000)
29	Total Miscellaneous Revenues	(9,065,000)	0%	(9,065,000)	0%	(9,065,000)	0%	(9,065,000)	0%	(9,065,000)
E. CITY OF NEW HAVEN REIMBURSEMENT										
30	CSO CWF Principal	(750,287)	6%	(797,835)	0%	(797,134)	2%	(813,224)	17%	(949,638)
31	CSO CWF Interest	(148,137)	-3%	(143,555)	-12%	(126,784)	-13%	(110,695)	7%	(118,281)
32	Total City of New Haven Reimbursement	(898,424)	5%	(941,389)	-2%	(923,918)	0%	(923,919)	16%	(1,067,919)
F. TO/(FROM) DEBT SERVICE RESERVE SINKING FUND										
33	To/(From) Debt Service Res. Sinking Fund	-		(689,909)		200,000		300,000		(500,000)
34	NET REVENUE REQUIREMENT	\$ 34,609,547	5%	\$ 36,317,987	5%	\$ 38,212,600	4%	\$ 39,826,167	5%	\$ 41,988,915
G. RECEIVABLE MANAGEMENT COSTS										
35		4,549,000		4,760,000		4,994,000		5,194,000		5,461,000
36	Estimated collection rate	89%		89%		89%		89%		89%
37	REVENUE REQUIREMENT	\$ 39,158,547	5%	\$ 41,077,987	5%	\$ 43,206,600	4%	\$ 45,020,167	5%	\$ 47,449,915
H. RATE CALCULATION										
38	Elderly Credit	\$ 27,000		\$ 27,000		\$ 27,000		\$ 27,000		\$ 27,000
39	Consumption	8,350,000		8,350,000		8,350,000		8,350,000		8,350,000
40	Number of bills	194,600		194,600		194,600		194,600		194,600
41	Administrative fee	\$ 14.00		\$ 14.00		\$ 15.00		\$ 16.00		\$ 17.00
42	CCF Rate	\$ 4.36		\$ 4.59		\$ 4.82		\$ 5.02		\$ 5.28
	Change from Prior Year	5.8%		5.3%		5.0%		4.0%		5.3%

Note - See Exhibit 2 for supporting calculations for Receivable Management Costs, Revenue Requirement and Debt Service Coverage amounts.

Exhibit 2.
Recommended User Rates - Supporting Calculations
For the Fiscal Year Ended June 30, 2018

1. RECEIVABLE MANAGEMENT CALCULATION

Net revenue requirement	\$ 34,609,547
Interest & lien fees	1,395,000
High strength surcharges	800,000
Customer revenue, net	\$ 36,804,547
Collection rate	89%
Customer revenue, gross	41,353,424
Receivable management cost	\$ 4,548,877

2. REVENUE REQUIREMENT

Total Cost of Services	\$ 42,013,971
Debt Service Coverage Requirement	2,559,000
Miscellaneous Revenues	(9,065,000)
New Haven Reimbursement	(898,424)
To/(From) DSR Sinking Fund	-
Receivable Management Cost	4,549,000
Revenue Requirement (from CCF Rate)	\$ 39,158,547

3. DEBT SERVICE COVERAGE CALCULATION

User fees	\$ 39,158,547
Miscellaneous Revenues	9,065,000
New Haven Reimbursement	898,424
(To)/From DSR Sinking Fund	-
Receivable management costs	(4,549,000)
Operations & Maintenance Costs	(29,219,756)
Net cash flow before debt service	\$ 15,353,215
Debt service	\$ 12,794,215
Coverage ratio	1.20

COST OF SERVICE STUDY FOR FISCAL YEAR 2018

Exhibit 3.
Budgeted Operations & Maintenance Expenses by Department

For the Fiscal Year Ended June 30, 2018
With Estimated Expenses for Fiscal Years 2019 through 2022

Line No.	Description	1	2	3	4	5	6	7	8	9
		FY18	% ch.	FY19	% ch.	FY20	% ch.	FY21	% ch.	FY22
EXECUTIVE DIRECTOR										
1	Personnel	\$ 429,997	2%	\$ 440,000	2%	\$ 449,000	2%	\$ 458,000	2%	\$ 468,000
2	Other Contracted Services	769,100	3%	792,000	3%	817,000	3%	842,000	3%	868,000
3	Equipment, Vehicles & Supplies	104,110	3%	107,000	3%	110,000	3%	113,000	3%	116,000
4	Contingency	500,000	0%	500,000	0%	500,000	0%	500,000	0%	500,000
5	Total EXECUTIVE DIRECTOR	1,803,207	2%	1,839,000	2%	1,876,000	2%	1,913,000	2%	1,952,000
FINANCE & ADMINISTRATION										
6	Personnel	852,580	3%	881,000	3%	909,000	3%	938,000	3%	968,000
7	Utilities	3,000	0%	3,000	0%	3,000	0%	3,000	0%	3,000
8	Other Contracted Services	135,800	3%	140,000	3%	144,000	3%	148,000	3%	152,000
9	Equipment, Vehicles & Supplies	4,000	0%	4,000	0%	4,000	0%	4,000	0%	4,000
10	Total FINANCE & ADMINISTRATION	995,380	3%	1,028,000	3%	1,060,000	3%	1,093,000	3%	1,127,000
CUSTOMER SERVICE										
11	Personnel	741,387	3%	766,000	3%	791,000	3%	816,000	3%	843,000
12	Other Contracted Services	502,500	3%	518,000	3%	533,000	3%	550,000	3%	567,000
13	Equipment, Vehicles & Supplies	10,000	0%	10,000	0%	10,000	0%	10,000	0%	10,000
14	Total CUSTOMER SERVICE	1,253,887	3%	1,294,000	3%	1,334,000	3%	1,376,000	3%	1,420,000
EMPLOYEE BENEFITS										
15	Personnel	2,528,156	10%	2,781,000	10%	3,059,000	10%	3,365,000	10%	3,702,000
16	Other Contracted Services	55,500	3%	57,000	4%	59,000	3%	61,000	3%	63,000
17	Total EMPLOYEE BENEFITS	2,583,656	10%	2,838,000	10%	3,118,000	10%	3,426,000	10%	3,765,000
ENGINEERING										
18	Personnel	973,870	3%	1,006,000	3%	1,039,000	3%	1,073,000	3%	1,108,000
19	Utilities	6,000	0%	6,000	0%	6,000	0%	6,000	0%	6,000
20	Other Contracted Services	971,000	1%	978,000	1%	985,000	1%	992,000	1%	999,000
21	Equipment, Vehicles & Supplies	4,000	0%	4,000	0%	4,000	0%	4,000	0%	4,000
22	Total ENGINEERING	1,954,870	2%	1,994,000	2%	2,034,000	2%	2,075,000	2%	2,117,000
OPERATIONS										
23	Personnel	3,238,331	3%	3,343,000	3%	3,452,000	3%	3,565,000	3%	3,681,000
24	Utilities	4,389,500	2%	4,477,000	2%	4,566,000	2%	4,656,000	2%	4,748,000
25	Plant Operations & Collection System	900,000	3%	927,000	3%	954,000	3%	983,000	3%	1,012,000
26	Contracted Maintenance	2,067,984	3%	2,130,000	3%	2,194,000	3%	2,260,000	3%	2,328,000
27	Contracted Sludge & Ash Disposal	3,157,981	3%	3,253,000	3%	3,351,000	3%	3,452,000	3%	3,556,000
28	Other Contracted Services	2,336,370	3%	2,404,000	3%	2,474,000	3%	2,547,000	3%	2,622,000
29	Equipment, Vehicles & Supplies	1,100,100	3%	1,133,000	3%	1,166,000	3%	1,199,000	3%	1,234,000
30	Plant Repairs & Replacement	1,914,000	3%	1,971,000	3%	2,030,000	3%	2,091,000	3%	2,154,000
31	Total OPERATIONS	19,104,266	3%	19,638,000	3%	20,187,000	3%	20,753,000	3%	21,335,000
GENERAL SERVICES										
32	Utilities	61,500	2%	63,000	2%	64,000	2%	65,000	2%	66,000
33	Other Contracted Services	701,490	3%	723,000	3%	745,000	3%	767,000	3%	790,000
34	Payments In-lieu of Taxes (PILOT)	750,000	0%	750,000	0%	750,000	0%	750,000	0%	750,000
35	Equipment, Vehicles & Supplies	11,500	4%	12,000	0%	12,000	0%	12,000	0%	12,000
36	Total GENERAL SERVICES	1,524,490	2%	1,548,000	1%	1,571,000	1%	1,594,000	2%	1,618,000
ALL DEPARTMENTS										
37	Personnel	8,764,321	5%	9,217,000	5%	9,699,000	5%	10,215,000	5%	10,770,000
38	Utilities	4,460,000	2%	4,549,000	2%	4,639,000	2%	4,730,000	2%	4,823,000
39	Plant Operations & Collection System	900,000	3%	927,000	3%	954,000	3%	983,000	3%	1,012,000
40	Contracted Maintenance	2,067,984	3%	2,130,000	3%	2,194,000	3%	2,260,000	3%	2,328,000
41	Contracted Sludge & Ash Disposal	3,157,981	3%	3,253,000	3%	3,351,000	3%	3,452,000	3%	3,556,000
42	Other Contracted Services	5,471,760	3%	5,612,000	3%	5,757,000	3%	5,907,000	3%	6,061,000
43	Payments In-lieu of Taxes (PILOT)	750,000	0%	750,000	0%	750,000	0%	750,000	0%	750,000
44	Equipment, Vehicles & Supplies	1,233,710	3%	1,270,000	3%	1,306,000	3%	1,342,000	3%	1,380,000
45	Plant Repairs & Replacement	1,914,000	3%	1,971,000	3%	2,030,000	3%	2,091,000	3%	2,154,000
46	Contingency	500,000	0%	500,000	0%	500,000	0%	500,000	0%	500,000
47	Total ALL DEPARTMENTS	\$ 29,219,756	3%	\$ 30,179,000	3%	\$ 31,180,000	3%	\$ 32,230,000	3%	\$ 33,334,000

COST OF SERVICE STUDY FOR FISCAL YEAR 2018

Exhibit 4.
Scheduled and Estimated Debt Service

For the Fiscal Years Ended June 30, 2018 through 2022

Line No.	Description	1 FY18	2 % ch.	3 FY19	4 % ch.	5 FY20	6 % ch.	7 FY21	8 % ch.	9 FY22
Revenue Bonds										
2005 Series A										
1	Principal	\$ -	0%	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
2	Interest	16,250	0%	16,250	0%	16,250	0%	16,250	0%	16,250
2008 Series A/CREBs										
3	Principal	166,667	0%	166,667	0%	166,667	0%	166,667	0%	166,667
4	Interest	7,792	-18%	6,375	-22%	4,958	-29%	3,542	-40%	2,125
2012 Series B										
5	Principal	205,000	2%	210,000	5%	220,000	2%	225,000	2%	230,000
6	Interest	328,144	-2%	321,919	-2%	315,469	-2%	308,794	-2%	302,688
2014 Series B										
7	Principal	2,360,000	3%	2,440,000	4%	2,545,000	5%	2,660,000	5%	2,795,000
8	Interest	3,133,963	-3%	3,049,763	-3%	2,950,063	-4%	2,832,663	-5%	2,696,288
2016 Series A										
9	Principal	445,000	4%	465,000	4%	485,000	5%	510,000	6%	540,000
10	Interest	603,650	-3%	585,450	-4%	564,025	-4%	539,150	-5%	512,900
Estimated Future Series										
11	Principal	-	0%	-	0%	-	0%	151,000	5%	158,000
12	Interest	-	0%	-	0%	208,000	140%	500,000	-2%	492,000
Total Revenue Bonds										
13	Principal	3,176,667	3%	3,281,667	4%	3,416,667	9%	3,712,667	5%	3,889,667
14	Interest	4,089,798	-3%	3,979,757	2%	4,058,765	3%	4,200,398	-4%	4,022,251
15	Total Debt Service - Revenue Bonds	\$ 7,266,465	0%	\$ 7,261,423	3%	\$ 7,475,432	6%	\$ 7,913,065	0%	\$ 7,911,917
Clean Water Fund Notes										
CSO Projects										
16	Principal	1,875,717	1%	1,901,937	2%	1,940,326	2%	1,979,490	2%	2,019,445
17	Interest	370,341	-10%	332,683	-12%	294,294	-13%	255,129	-16%	215,175
Non-CSO Projects										
18	Principal	527,741	2%	538,393	2%	549,261	1%	554,010	0%	552,398
19	Interest	173,255	-6%	162,603	-7%	151,736	-7%	140,668	-8%	129,642
Estimated Future Notes - CSO Projects										
20	Principal	-	0%	92,649	-43%	52,509	2%	53,569	562%	354,650
21	Interest	-	0%	26,204	-13%	22,667	-5%	21,608	273%	80,526
Estimated Future Notes - Non-CSO Projects										
22	Principal	1,864,440	48%	2,765,099	-6%	2,598,404	0%	2,605,692	43%	3,735,133
23	Interest	716,256	32%	948,293	-2%	932,889	-6%	880,854	22%	1,073,947
Total Clean Water Fund Notes										
24	Principal	4,267,898	24%	5,298,079	-3%	5,140,500	1%	5,192,761	28%	6,661,627
25	Interest	1,259,852	17%	1,469,783	-5%	1,401,586	-7%	1,298,259	15%	1,499,290
26	Total Debt Service - CWF Notes	\$ 5,527,751	22%	\$ 6,767,862	-3%	\$ 6,542,086	-1%	\$ 6,491,020	26%	\$ 8,160,916
City of New Haven Share of CSO Projects										
CSO Projects										
27	Principal	(750,287)	1%	(760,775)	2%	(776,130)	2%	(791,796)	2%	(807,778)
28	Interest	(148,137)	-10%	(133,073)	-12%	(117,717)	-13%	(102,052)	-16%	(86,070)
Estimated Future Notes - CSO Projects										
29	Principal	-	0%	(37,060)	-43%	(21,004)	2%	(21,428)	562%	(141,860)
30	Interest	-	0%	(10,482)	-13%	(9,067)	-5%	(8,643)	273%	(32,211)
Total City Share of CSO Projects										
31	Principal	(750,287)	6%	(797,835)	0%	(797,134)	2%	(813,224)	17%	(949,638)
32	Interest	(148,137)	-3%	(143,555)	-12%	(126,784)	-13%	(110,695)	7%	(118,281)
33	Total Debt Service - New Haven Share	\$ (898,424)	5%	\$ (941,389)	-2%	\$ (923,918)	0%	\$ (923,919)	16%	\$ (1,067,919)
Total Net Debt Service										
34	Principal	6,694,278	16%	7,781,911	0%	7,760,033	4%	8,092,204	19%	9,601,655
35	Interest	5,201,513	2%	5,305,985	1%	5,333,567	1%	5,387,962	0%	5,403,260
36	Total Net Debt Service	\$ 11,895,791	10%	\$ 13,087,896	0%	\$ 13,093,600	3%	\$ 13,480,167	11%	\$ 15,004,915

Exhibit 5.
Capital Improvement Plan
For the Fiscal Years Ended June 30, 2018 through 2022

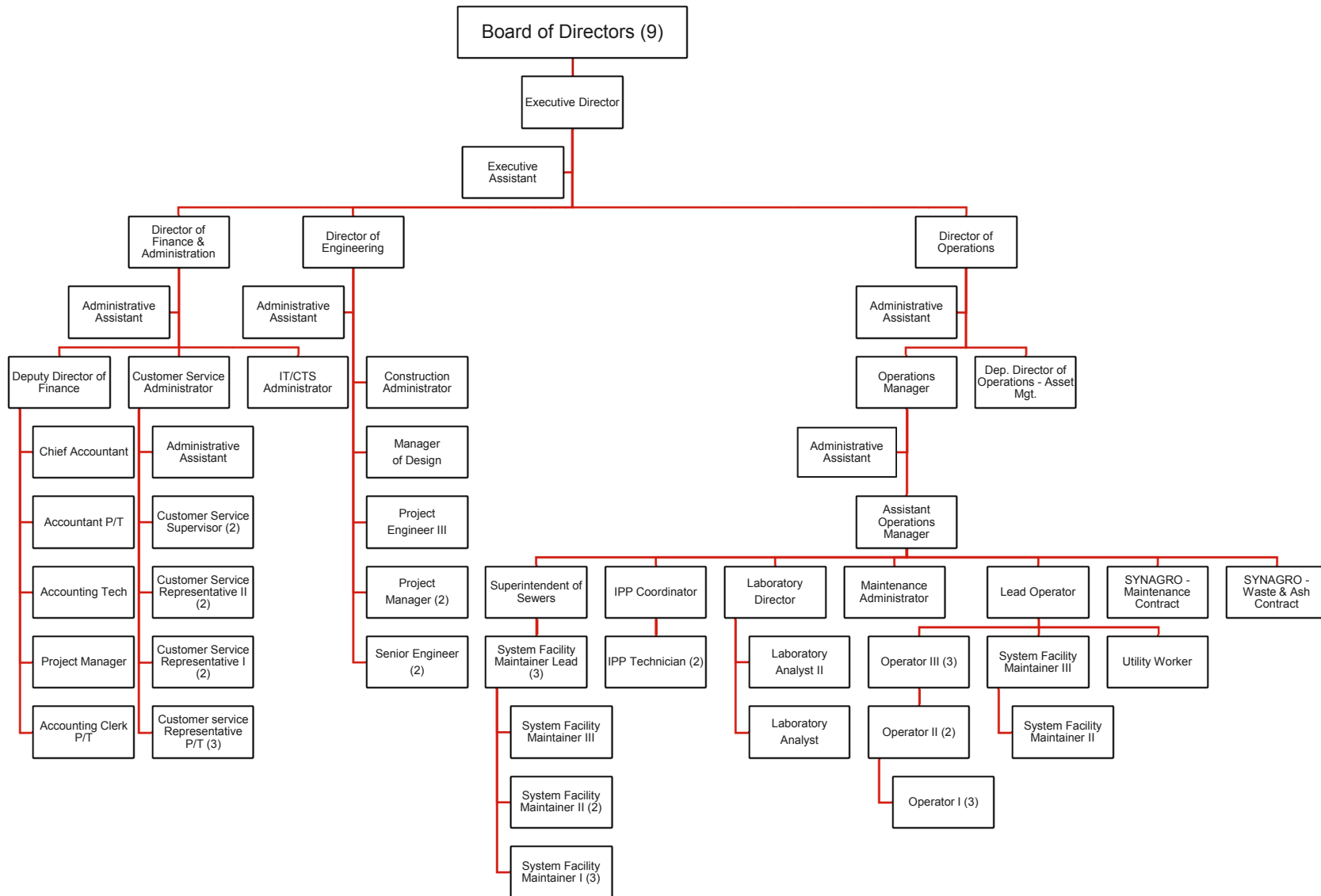
Line No.	Description	1 FY18	2 FY19	3 FY20	4 FY21	5 FY22	6 Total
COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN							
1	Design and Construction East Street Pump Station	-	\$ 3,500,000	-	-	-	\$ 3,500,000
2	Yale Trumbull Study/Design/Construction (Phase 2B)	-	-	\$ 100,000	\$ 11,900,000	-	12,000,000
3	Total CSO Long Term Control Plan	-	\$ 3,500,000	\$ 100,000	\$ 11,900,000	-	\$ 15,500,000
EAST SHORE WATER POLLUTION CONTROL FACILITY							
4	East Shore Grit Classifiers/Conveyors	\$ 500,000	-	-	-	-	\$ 500,000
5	East Shore Inlet Work/Gate Actuators	150,000	-	-	-	-	150,000
6	Ethernet Radios	300,000	-	-	-	-	300,000
7	Green Infrastructure Project	500,000	-	-	-	-	500,000
8	Roof Railings - Various buildings	100,000	-	-	-	-	100,000
9	Secondary Clarifier Drain Valves	160,000	-	-	-	-	160,000
10	Aeration Blowers	50,000	\$ 500,000	-	-	-	550,000
11	Concrete Work - Chlorine Contact and Wall Repairs	50,000	500,000	-	-	-	550,000
12	Polymer Tank Additions/Twas Tank Rehab	50,000	200,000	-	-	-	250,000
13	Grit Pad/Collections Maint. Building	75,000	1,150,000	-	-	-	1,225,000
14	Primary Clarifier Drive and Screw Replacements	140,000	-	-	-	\$ 160,000	300,000
15	Plant Repairs - Unidentified	-	-	\$ 850,000	\$ 850,000	850,000	2,550,000
16	Biosolids Handling Review	-	-	-	100,000	-	100,000
17	Total East Shore WPC Facility	\$ 2,075,000	\$ 2,350,000	\$ 850,000	\$ 950,000	\$ 1,010,000	\$ 7,235,000
COLLECTION SYSTEM, PUMP STATIONS & FORCE MAINS							
18	24" Quin Interceptor CIPP Lining	\$ 790,000	-	-	-	-	\$ 790,000
19	Fire Alarm - Pump Stations	100,000	-	-	-	-	100,000
20	Flowmeters - East Shore	60,000	-	-	-	-	60,000
21	Grit Collectors - East Shore	600,000	-	-	-	-	600,000
22	Morris Cove Odor Control - Pope Street	200,000	-	-	-	-	200,000
23	Oregon-Belden Sewer Reconstruction	79,000	-	-	-	-	79,000
24	State and Union Interim Upgrades	400,000	-	-	-	-	400,000
25	HVAC Admin. Building	200,000	\$ 200,000	-	-	-	400,000
26	Pump Station Improvements	500,000	50,000	\$ 500,000	\$ 50,000	\$ 500,000	1,600,000
27	Emergency Sewer Repair and Replacement	300,000	300,000	300,000	300,000	300,000	1,500,000
28	Main Sewerage Pumps - East Shore	140,000	140,000	-	140,000	140,000	560,000
29	Manhole Rehabilitation Program	815,000	-	-	700,000	-	1,515,000
30	Compactors - Boulevard	-	160,000	-	-	-	160,000
31	Roof Replacements - East Shore	-	450,000	-	-	-	450,000
32	Mill River Phase 2 SSES Hamden - Part 1	-	750,000	-	-	-	750,000

Exhibit 5., continued
Capital Improvement Plan

For the Fiscal Years Ended June 30, 2018 through 2022

Line No.	Description	1 FY18	2 FY19	3 FY20	4 FY21	5 FY22	6 Total
COLLECTION SYSTEM, PUMP STATIONS & FORCE MAINS							
33	Mill River Phase 2 SSES Hamden - Part 2	-	-	\$ 750,000	-	-	\$ 750,000
34	Woodbridge Areas 2 & 2A/East Haven Areas 15, 18, 23	-	\$ 400,000	3,000,000	-	-	3,400,000
35	Cured-in-Place Pipe Lining	-	700,000	700,000	\$ 700,000	\$ 700,000	2,800,000
36	Design and Construction East Street Pump Station	-	-	31,300,000	-	-	31,300,000
37	Morris Cove Bar Screens	-	-	700,000	-	-	700,000
38	Pump Station Repairs - Unidentified	-	-	850,000	850,000	850,000	2,550,000
39	Design and Construction Union Street Pump Station	-	-	-	-	1,700,000	1,700,000
40	Total Coll. System, Pump Stations & Force Mains	\$ 4,184,000	\$ 3,150,000	\$ 38,100,000	\$ 2,740,000	\$ 4,190,000	\$ 52,364,000
41	TOTAL CAPITAL IMPROVEMENT PLAN	\$ 6,259,000	\$ 9,000,000	\$ 39,050,000	\$ 15,590,000	\$ 5,200,000	\$ 75,099,000
SOURCES OF FINANCING							
42	Clean Water Fund - Grants	\$ 250,000	\$ 2,162,500	\$ 16,112,500	\$ 5,950,000	\$ 850,000	\$ 25,325,000
43	Clean Water Fund - Notes	250,000	2,150,000	18,700,000	5,950,000	850,000	27,900,000
44	<i>Total Clean Water Fund</i>	500,000	4,312,500	34,812,500	11,900,000	1,700,000	53,225,000
45	Revenue Bonds	-	-	10,000,000	-	-	10,000,000
46	Dedicated Infrastructure Renewal Fund	5,759,000	4,687,500	4,237,500	3,690,000	\$ 3,500,000	21,874,000
47	Total Sources of Financing	\$ 6,259,000	\$ 9,000,000	\$ 49,050,000	\$ 15,590,000	\$ 5,200,000	\$ 85,099,000

**Exhibit 6.
Organization Chart**



Arcadis U.S., Inc.

44 South Broadway

15th Floor

Box 751

White Plains, New York 10602-0751

Tel 914 694 2100

Fax 914 694 9286

www.arcadis.com

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