Town of Bedford

321 Bedford Road • Bedford Hills, NY 10507

Wastewater Asset Condition Assessment and Valuation

June 2011

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Executive Summary

The Town of Bedford (Town) is considering acquiring the Bedford Hills Correctional Facility Wastewater Treatment Plant (WWTP) currently owned by the New York State Department of Correctional Services (DOCS) to provide wastewater treatment services to a potential town sewer district. This Wastewater Asset Condition Assessment and Valuation Report has been prepared on behalf of the Town.

The purpose of this report is to provide the Town with an estimate of the condition and value of DOCS' wastewater assets. For the purposes of this report, the DOCS' wastewater system assets are comprised of the unit operations located at the wastewater treatment plant and the two remote screening facilities located at the Bedford Hills and Taconic Correctional Facilities. The collection system is not included in this evaluation. The estimate of value is based upon a calculated book value (original cost less accumulated depreciation) of the system. This report presents the opinion of Malcolm Pirnie, Inc. (Malcolm Pirnie) with respect to the value of DOCS' wastewater assets using the book value method. We understand that the Town intends to use the book value, as documented in this report, as a basis for a negotiated sale, franchise, long term lease or other structure to transfer the responsibility of these assets.

Malcolm Pirnie utilized publicly available information, reports previously completed by Malcolm Pirnie (*Sanitary Sewer Extension and Plant Capacity Analysis*, July 2003) and information provided by DOCS related to DOCS' wastewater assets in preparing this report. This information predominately consisted of process operating data and condition assessment and valuation reports completed by HydroQual, Inc. on behalf of DOCS. Malcolm Pirnie also conducted a limited site inspection of the facility which was used to assess facility conditions.

The report summarizes the condition and value of the system based on the information readily available by the date of the report. Changed conditions occurring or becoming known after such date could affect the material presented to the extent of such changes. Malcolm Pirnie has not independently verified the accuracy of the information provided by DOCS or others; however, we believe such sources are reliable and the information obtained to be appropriate for the analysis undertaken and the conclusions reached herein. Any statements in this report involving estimates or matters of opinion, whether or not so specifically designated, are intended as such, and not as representation of fact.

It was not the intent of the analyses or the determinations contained within this report to conduct a due diligence of the system. Should the sale, lease, franchise or any other

method of transferring part or all of DOCS' wastewater assets be further considered, Malcolm Pirnie recommends that a full due diligence of assets be conducted.

Condition of Facilities Summary

Malcolm Pirnie assessed the condition of the treatment plant assets through a review of existing documents and data and a one-day inspection of facility assets. A detailed description of the condition assessment is presented in Section 3 of the report. The assets were rated using the rating system described in Table ES-1, which is drawn from a rating system published by the Association of Metropolitan Sewerage Agencies. The overall rating of DOCS' wastewater facility is as outlined in Table ES-2. In general, Malcolm Pirnie finds DOCS' wastewater system facilities to be in "good to fair" condition based on a limited visual inspection and a desktop review of available reports and information.

ES-1: Summary of Condition Rating System

Asset Condition Assessment Rating Scale

GRADE	CONDITION	DESCRIPTION
0	Abandoned	Asset abandoned, no longer in use, or no longer exists
1	Very Good	Sound physical condition. Meets current needs. Operable and well-maintained. Asset expected to perform adequately with routine maintenance for 10 yr or more. No work required.
2	Good	Acceptable physical condition. Shows minor wear that has minimal impact on performance. Minimal short-term failure risk. Potential for deterioration or impaired performance over next 5-10 years. Minor work (if any) required.
3	Fair	Functionally sound but showing wear and diminished performance. Moderate short-term failure risk. Potential for further deterioration and diminished performance within next 5 years. Renewal or major component replacement expected within next 5 years. Minor work required but asset is serviceable.
4	Poor	Asset functions but requires high level of maintenance to remain operable. High risk of short-term failure. Likely to have significant deterioration in performance within next 2 years. Renewal or replacement expected within next 2 years. Substantial work required, asset barely serviceable.
5	Very Poor	Asset failed or failure is imminent. Excessive maintenance required. No further service life expectancy. Significant health and safety hazard. Major work or replacement is urgent.

Source: Association of Metropolitan Sewerage Authorities, "Managing Public Infrastructure Assets," 2002

ES-2: Summary of Overall Facility Condition Ratings

	Overall Asset Condition Ratings				
	Asset Categories			Facility	
Facility Process	Equipment	Buildings	Concrete Tanks	Average	Condition Description
Preliminary Treatment	2.4	2.2	1.3	2.0	Good
Primary Treatment	2.0	N/A	1.5	1.8	Very Good to Good
Secondary Treatment	3.3	N/A	3.5	3.4	Fair to Poor
Tertiary Treatment	2.4	2.5	2.0	2.3	Good to Fair
Solids Handling	3.7	2.0	2.0	2.6	Good to Fair
Other	2.1	3.0	1.0	2.0	Good
Average Rating:	**2.7**	**2.4**	**1.9**	**2.3**	**Good to Fair**

Valuation of Facilities Summary

Three generally accepted methods are used in the valuation of assets: the Cost Approach, the Sales Comparison Approach, and the Income Capitalization Approach. Given that the Town is considering acquiring, leasing or otherwise transferring all or part of DOCS' wastewater assets to the Town, Malcolm Pirnie utilized a modified Cost Approach to estimate the net book value (original cost less accumulated depreciation) and replacement cost new less depreciation value of DOCS' wastewater system assets.

The replacement cost new less depreciation method assesses the potential value of system assets by subtracting the accumulated depreciation from the estimated replacement cost of all assets in service. This method is also typically used to establish a baseline of potential value for determining the feasibility of system acquisition, particularly when information about the system is limited.

The original cost less accumulated depreciation method assesses the potential value of the system based on net book value. This method provides a lower end of potential value when the utility system rates are regulated, and rates are based on a rate base that considers the asset's original cost, rather than replacement cost. This method also may include adjustments for system condition, engineering design and construction standards, non-used and useful assets, excess capacity, and going concern value. We understand that the Town intends to use the net book value, as documented in this report, as a basis for a negotiated sale, franchise, long term lease or other structure to transfer the responsibility of these assets.

In general, the modified cost approach involved estimating the cost of replacing the assets at current costs (2010 dollars) and then reducing the cost by applying cost indices reflective of construction cost trends to estimate the original cost of the assets, and depreciation factors to reflect the estimated age and condition of the assets. The modified cost approach used to value the assets involved the following steps:

1. Development of an asset inventory
2. Estimation of asset replacement cost new
3. Estimation of original cost
4. Estimation of accumulated depreciation
5. Calculation of original cost less depreciation and replacement cost new less depreciation values.

Based on the review and analysis of available asset information, and to the best of our knowledge, information and belief, it is estimated that the net replacement value less depreciation value of DOCS' combined wastewater system as defined in this report is

approximately $11.5 million. Furthermore, it is estimated that the original cost less depreciation value (net book value) of DOCS' combined wastewater system is approximately $8 million, as summarized in the Table ES-3.

The estimated values represent the physical asset value of the wastewater system with no consideration as to how any existing debt would be handled in the event of a sale, lease, franchise or other method of transferring the assets. Additionally, no information was provided relative to any grant funding used to fund system construction and/or rehabilitation and replacement, and the amount of grant funding could impact the transaction price.

ES-3: Estimated Value of DOCS' Wastewater Facility

Asset Category	Replacement Cost New (RCN)	Replacement Cost New Less Depreciation (RCNLD)	Original Cost (OC)	Original Cost Less Depreciation (OCNLD)
Equipment	$ 6,546,000	$ 3,462,000	$ 4,268,000	$ 2,320,000
Buildings	6,244,000	5,236,000	4,123,000	3,517,000
Concrete Tanks	1,087,000	864,000	596,000	478,000
Site Work	1,041,000	717,000	674,000	474,000
Land	1,200,000	1,200,000	1,200,000	1,200,000
Total	**$ 16,118,000**	**$ 11,479,000**	**$ 10,861,000**	**$ 7,989,000**

NOTE: Valuation does not reflect current wastewater debt or grants used to fund asset construction.
Land value provided by Rand Commercial Realty, as cited in the HydroQual Memorandum dated May 2010.

Furthermore, it is not known whether the wastewater facility will satisfy Town construction standards (e.g., code compliance, health and safety, building specifications). There may be differences in construction standards used by DOCS and the standards employed by the Town, and these differences may affect the value of the wastewater assets for the Town.

While the estimates and assumptions utilized in this report are reasonable given the available information, the value estimate was prepared with limited asset specific information (asset age and original cost), and with limited condition data. Differences between the actual quantity and condition of the assets and the estimates and assumptions employed in this report may have a material impact on the estimate of value. As such, we take no responsibility for the accuracy of data provided by or prepared on behalf of DOCS or the Town. The calculations supporting the estimated asset valuation are included in ***Appendix H***.

Facility Expansion Alternative Summary

An opinion of the probable costs for constructing the proposed sewage collection system and expanding the existing WWTP from 0.5 to 1.05 million gallons per day (MGD) was previously prepared by Malcolm Pirnie (*Sanitary Sewer Extension and Plant Capacity Analysis*, July 2003). These costs have been updated to reflect current bidding environment. Costs were primarily adjusted based on the Engineering News Record (ENR) Construction Cost Index (CCI) and now reflect 2011 costs. An updated estimate for rock excavation is also included. Details of the cost estimate update are presented in Section 5 of this report.

The probable cost for constructing the sewage collection system and pumping stations is estimated at approximately $25,339,000. The probable cost of expanding the existing WWTP at DOCS facilities is estimated to be approximately $9,855,000. The total construction cost for the sewage collection system and plant expansion is estimated at approximately $35,200,000.

Construction costs are only a part of the total capital expenditures incurred in establishing a new sewer district and building a sewerage system. Other necessary capital expenditures include, but are not limited to, engineering, land acquisition, legal and financing, and administrative costs. The total capital cost for a project includes all of the above items plus an allowance for construction contingencies and is traditionally referred to as the "Total Project Cost". An opinion of the Total Project Cost for the proposed Bedford Project is estimated at $54,300,000. This figure does not take into account any grants or other financial assistance which may be available. The costs presented show the maximum amount of money that is anticipated to be expended on the project by the time it is completed and ready to be placed in service.

The facility expansion costs described in this report are inclusive of costs associated with the repair and replacement of critical facility equipment deemed in poor condition that is needed to operate the facility under current regulations. However, it is important to note that future regulations may change which may result in the need for additional facility upgrades.

Benchmarks are provided to assist the Town with estimating repair and replacement needs over the twenty year planning period. Based on the 2005 American Water Works Association (AWWA) and Water Environment Federation (WEF) QualServe Benchmarking Program report entitled, "Benchmarking Performance Indicators for Water and Wastewater Utilities: Survey Data and Analyses Report", the median system renewal and replacement rate for wastewater treatment facilities in the Northeast is approximately two to three percent. It is recommended that the Town anticipate a capital improvement program comprised of approximately two to three percent of the estimated replacement cost new of the wastewater system. This level of system renewal and

replacement is consistent with the level of system renewal and replacement utilized by other similarly sized wastewater collection systems across the country.

Once the new sewerage system is placed in operation, the Town Sewer District will be responsible for operating and maintaining it. Operation and maintenance (O&M) costs include labor, electrical power, treatment chemicals, spare parts, the cost of contractual services such as telephone lines and alarm system monitoring services, consumable supplies and similar expenses. The O&M cost for the six wastewater pumping stations is estimated to be approximately $112,000 per year as shown in Table 5-5. The estimated O&M cost for the wastewater treatment plant is approximately $922,400 as shown in Table 5-6. However, this cost will be shared by the Town and the DOCS, and some of the costs attributable to microfiltration, required by the WR&R, will be reimbursed by the NYC DEP. The total O&M costs for the first year of operation of the new system is estimated at approximately $1,034,400.

In order to estimate the share of the O&M cost that will be borne by sewer users in the proposed new Town district, it has been assumed that DOCS will contribute at least as much toward the O&M costs as it is paying to operate the plant. The DOCS budget for 2003 showed a cost of approximately $430,000. A current O&M budget was requested from DOC's but did not appear comprehensive and was lower ($380,000) than the 2003 budget. Hence, as a means to estimate their contribution, a flow-based approach was used. We estimated $922,000 per year for a total flow of 1 mgd and the DOCS capacity reserve is 450,000 gpd. Therefore, their portion of the plant's O&M costs would be approximately $415,000 ($922,400 x 45%) which is closer to the $430,000 they budgeted previously. Annual payments of $100,000 by NYC DEP for operating the advanced treatment processes at the expanded plant and a payment of $20,000 from New York State for treating I-684 wastewater have also been assumed. Thus, the amount of the estimated $1,034,400 O&M cost which must be raised from charges to properties in the sewer district is estimated at $499,400 during the first year of operation.

Findings and Recommendations

As described in Section 6, it is estimated that approximately 2,000 equivalent dwelling units (EDUs) will be served by the new sewerage system, excluding the correctional facilities and the I-684 Rest Area, which are outside the proposed district limits and would be served by contract. In order to estimate the initial year's cost for the sewerage system to a typical, single family home owner, an estimate of the total annual cost must be made. The total annual cost to the sewer district for the initial year of operation, referred to as the "first year total annual cost", is made up of the first year cost for O&M and required debt service payments. For the purposes of this report, it is assumed that the Town will issue 30-year General Obligation (ad valorem serial bonds) Bonds with an interest rate of 4 percent, an issuance cost of 1.5 percent and equal annual payments.

Table ES-4 summarizes these costs for six different levels of debt service, based on different assumptions regarding the amount of grant funding received and the amount of any acquisition cost incurred, and also shows the anticipated first year cost to a typical homeowner. The costs range from approximately $1,255 per EDU to $2,180 per EDU. The following six scenarios, as described in Section 5.2.4 of this report, are considered:

- Scenario 1: Maximum Anticipated Project and Acquisition Costs
- Scenario 2: Maximum Costs with Anticipated Grant Funding
- Scenario 3: Maximum Project Cost and Mid-Range Acquisition Cost
- Scenario 4: Maximum Project Cost with Grant Funding and Mid-Range Acquisition Cost
- Scenario 5: Maximum Project Cost and No Acquisition Cost
- Scenario 6: Maximum Project Cost with Grant Funding and No Acquisition Cost

ES-4: Estimated Typical Homeowner Cost for Initial Year of Operation

Description	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Project Cost	$54,264,000	$54,264,000	$54,264,000	$54,264,000	$54,264,000	$54,264,000
Financial Aid	$0	$20,000,000	$0	$20,000,000	$0	$20,000,000
Local Share of Project Cost	$54,264,000	$34,264,000	$54,264,000	$34,264,000	$54,264,000	$34,264,000
Acquisition Cost	$11,500,000	$11,500,000	$8,000,000	$8,000,000	$0	$0
Total Cost to be Financed	$65,764,000	$45,764,000	$62,264,000	$42,264,000	$54,264,000	$34,264,000
Annual Debt Service	$3,860,000	$2,686,000	$3,655,000	$2,481,000	$3,185,000	$2,011,000
Local Share of O&M Cost	$499,400	$499,400	$499,400	$499,400	$499,400	$499,400
Total First Year O&M and Debt Service Cost	$4,359,400	$3,185,400	$4,154,400	$2,980,400	$3,684,400	$2,510,400
Estimated EDUs	2,000	2,000	2,000	2,000	2,000	2,000
First Year Cost per EDU	**$2,180**	**$1,593**	**$2,077**	**$1,490**	**$1,842**	**$1,255**

There are additional factors relative to procuring the DOCS' wastewater assets that the Town may consider. The advantages of procuring the DOCS' wastewater assets include enhanced environmental stewardship, control of wastewater treatment costs and the ability to adapt for potential future growth. The disadvantages include the increased administrative burden associated with providing wastewater services and various risks associated with facility ownership. These factors are described in more detail in Section 6.2 of this report.

Should the Town decide to move forward with a negotiated sale, franchise, long term lease or other structure to transfer the responsibility of these assets, it is recommended that the Town obtain legal assistance regarding the applicability of state and local laws and regulations governing the transfer of the assets to the Town. It is also recommended that a full due diligence of the wastewater assets is conducted.

Once negotiations with the DOCS, the NYS DEP and Westchester County are complete, should the asset acquisition take place, the Town will need to implement policies, procedures and ordinances relative to the management of the wastewater treatment assets. In alignment with the industry's best management practices, it is recommended that the Town consider the development of an asset management plan to support ongoing maintenance activities as well as future repair and rehabilitation needs. Furthermore, the development of a long term financial plan, including a wastewater rate and charge study, will help to ensure the financial sustainability of the wastewater treatment assets.

1. Introduction

The Town of Bedford (Town) is considering acquiring the Bedford Hills Correctional Facility Wastewater Treatment Plant currently owned by the New York State Department of Correctional Services (DOCS) to provide wastewater treatment services to a potential town sewer district. This Wastewater Asset Condition Assessment and Valuation Report has been prepared on behalf of the Town.

1.1. Purpose

The purpose of this report is to provide the Town with an estimate of the condition and value of DOCS' wastewater assets. For the purposes of this report, the DOCS' wastewater system assets are comprised of the unit operations located at the wastewater treatment plant and the two remote screening facilities located at the Bedford Hills and Taconic Correctional Facilities. The collection system is not included in this evaluation. The estimate of value is based upon a calculated book value (original cost less accumulated depreciation) of the system. This report presents the opinion of Malcolm Pirnie, Inc. (Malcolm Pirnie) with respect to the value of DOCS' wastewater assets using the book value method. We understand that the Town intends to use the book value, as documented in this report, as a basis for a negotiated sale, franchise, long term lease or other structure to transfer the responsibility of these assets.

Malcolm Pirnie utilized publicly available information, reports previously completed by Malcolm Pirnie (*Sanitary Sewer Extension and Plant Capacity Analysis*, July 2003) and information provided by DOCS related to DOCS' wastewater assets in preparing this report. This information predominately consisted of process operating data and condition assessment and valuation reports completed by HydroQual, Inc. on behalf of DOCS. Malcolm Pirnie also conducted a limited site inspection of the facility which was used to assess facility conditions.

The report summarizes the condition and value of the system based on the information readily available by the date of the report. Changed conditions occurring or becoming known after such date could affect the material presented to the extent of such changes. Malcolm Pirnie has not independently verified the accuracy of the information provided by DOCS or others; however, we believe such sources are reliable and the information obtained to be appropriate for the analysis undertaken and the conclusions reached herein. Any statements in this report involving estimates or matters of opinion, whether or not so specifically designated, are intended as such, and not as representation of fact.

It was not the intent of the analyses or the determinations contained within this report to conduct a due diligence of the system. Should the sale, lease, franchise or any other

method of transferring part or all of DOCS' wastewater assets be further considered, Malcolm Pirnie recommends that a full due diligence of assets be conducted to refine the estimates provided herein and to establish an appropriate negotiation value.

1.2. Organization

In addition to the Executive Summary and this introductory section, this report includes the following sections:

- **Section 2 – System Description** – presents a summary of the physical assets that comprise DOCS' wastewater system.
- **Section 3 – Condition of Facilities** – describes the condition assessment activities and analysis, and provides a description of the assessed condition of DOCS' wastewater assets.
- **Section 4 – Valuation of Facilities** – provides an overview of the valuation approach used and the estimated value of DOCS' wastewater assets.
- **Section 5 – Facility Expansion Alternative Update** – provides an overview of the impact of the proposed lower nutrient limits, updated cost estimates for the proposed plant expansion, recommended capital improvements and new Town collection system, and the anticipated future repair and replacement costs required to maintain the wastewater system.
- **Section6 – Findings and Recommendations** – presents estimated annual homeowner cost impacts under different project cost assumptions, and provides an overview of additional considerations and next steps should the Town decide to move forward with asset acquisition.

2. System Description

This section presents a brief description of the DOCS' wastewater system. This information was obtained from documents and reports supplied by DOCS, the *Sanitary Sewer Extension and Plant Capacity Analysis* completed by Malcolm Pirnie in July 2003, and information collected from publicly available sources.

2.1. Overview of the Assets

The DOCS' wastewater system provides for the collection, treatment and disposal of sanitary sewage. The system was constructed in the early 1900s on a gravity concept. The most recent facility rehabilitation and reconstruction projects occurred in early 1990s and early 2000s. The DOCS operates and maintains 12 buildings in addition to various facility equipment and tanks which are described in greater detail below.

The wastewater system collects wastewater from the Bedford Hills and Taconic Correctional Facilities and one New York State Department of Transportation rest area located on Route 684. Flow is conveyed by gravity to the wastewater treatment facility. Treated wastewater is discharged to Broad Brook, which flows into the Muscoot Reservoir. The discharge of the wastewater treatment plant is located within the 60-day time of travel.

The wastewater treatment facility has a permitted 30-day average daily flow capacity of 0.5 million gallons per day (MGD). Average daily flows range from 0.2 MGD to 0.3 MGD.

2.2. Description of Facilities

This section provides a brief description of the individual asset classes comprising DOCS' wastewater system: Equipment, Buildings and Concrete Tanks. An asset inventory for DOCS wastewater facilities is included in ***Appendix A***. For the purposes of this report, the wastewater assets are comprised of the unit operations located at the wastewater treatment plant and the two remote screening facilities located at the Bedford Hills and Taconic Correctional Facilities. The collection system is not included in this evaluation.

2.2.1. Equipment

2.2.1.1. Preliminary Treatment

Preliminary treatment consists of two remote screening facilities, grit removal and flow equalization. There is a remote screening facility located at each correctional facility.

These facilities provide protection of blockage of the exiting siphons that convey wastewater from each correctional facility under Broad Brook to the wastewater treatment plant. Each remote screening facility is equipped with a Rotary Fine Screen, Model No. 16 MS-0.250-75, as manufactured by Lakeside Equipment Corporation. Each facility also is equipped with an inline channel grinder, as manufactured by Monoflow, Inc.

At the wastewater treatment facility there are two parshall flumes each with a 9-inch throat and minimum recommended flow rates of 0.6 MGD and maximum flow rates of 5.7 MGD and with head conditions of 0.1 feet and 2 feet, respectively. These units are not operational, as a surcharged condition does not allow accurate head or flow readings and the ultrasonic transducers have been removed.

There is a Vortex Grit Separator and Grit Classifier, as manufactured by WasteTech, and a Hayward Gordon CR4-7 grit pump. Upstream of the vortex grit chamber is an inline channel grinder, Model 3000-24, as manufactured by JWC Environmental, Inc. with a 720 gallons per minute (gpm) capacity.

After grit removal, flow is equalized in one of two equalization tanks. The reported total effective volume of the flow equalization facilities is 87,400-gallons. Each equalization tank is equipped with a course bubble aeration system for mixing purposes. There are two blowers in a lead/lag configuration that provide air to a common header.

There are three influent, dry pit, submersible pumps, Model No. KRT K 100-251, as manufactured by KSB, Inc. that are designed to operate at 350 gpm and 26 feet of total dynamic head, assuming that two pumps are in operation. Each pump is equipped with a 10 horsepower (hp) explosion-proof, duty rated motor and variable frequency drive. The influent pump control system employs a programmable logic controller (PLC) and utilizes proportional control to increase the flow through the WWTF as the liquid level in the equalization tanks increase. The influent pump control panel is equipped with an uninterruptible power system (UPS) to maintain PLC settings prior to the emergency generator being activated during a power outage. All control panels for the influent pump station are located in the blower building. Influent flows are monitored through a magnetic flow meter located downstream of the influent pumps, however, recycle flows from the rapid sand filter and microfiltration system are returned to the equalization basins.

Upstream of primary clarification, the wastewater passes through two Vulcan Stato-Screens, as manufactured by Vulcan Industries, Inc. Each screen has a capacity of 360 gpm at a suspended solids loading rate of 300 mg/l. The static screens are utilized to prevent material greater than 1.5 millimeters (mm) from passing into the primary clarifiers. The operators are currently bypassing the screens. The static screen building is very small and promotes unsanitary conditions when the screens are in use. Untreated

wastewater splashes off the screens and virtually covers the inside of the building. The remote screening facilities were installed after the construction of the static screens and since wastewater is screened prior in the collection system, screening currently does not need to be performed at the WWTP.

2.2.1.2. Primary Treatment

There are two rectangular primary clarifiers with non-metallic sludge collection mechanisms (collector chains, sprockets and flights). The sludge collection mechanism drive units are powered by ½ hp motors. Each primary clarifier is 41 feet in length, 14 feet in width and has a 10-foot side water depth. They each have a surface area of 560 square feet and a weir length of 28 feet. Based on the recommendations of Ten States Standards, the maximum average daily flow through the primary clarifiers is 560,000 gallons per day (gpd), based on a surface overflow rate of 1,000 gpd per square foot, a weir loading rate of 20,000 gpd per linear foot of weir, and assuming one clarifier is out of service.

The primary clarifiers have been retrofitted with surface sprayers to control foaming which results from the detergents used at the correctional facilities. There are provisions to add aluminum sulfate (alum) in each primary clarifier for chemical precipitation of phosphorous.

2.2.1.3. Secondary Treatment

Primary clarifier effluent is pumped to the trickling filters by three (one standby) 4-inch vertical dry pit, non-clog Model No. B5442V pumps, as manufactured by the Fairbanks Morse Pump Corporation. As part of the 2001 upgrade, these pumps were retrofitted with new impellers and motors. The trickling filter feed pumps are capable of lifting 700 gpm against a total dynamic head of 55 feet. The pumps are controlled by a PLC based control system and variable frequency drives. The control panel has a UPS backup and the pump speed is directly proportional to the liquid level in the wet well.

There are two high rate trickling filters that achieve secondary treatment using plastic cross flow media, manufactured by Surfpac Corp. The trickling filters have diameters of 34 feet and 32.5 feet, respectively, and have a depth of 16 feet each. The trickling filters employ a rotary distributor that utilizes the dynamic reaction of wastewater discharging from the nozzles to drive the distributor arm.

During the 1986 upgrade of the Bedford Hills WWTF, an original, shallow rock media trickling filter was modified to the present higher rate deep bed configuration and a second new high rate trickling filter was constructed. The base of the smaller trickling filter was the original shallow rock media trickling filter with a metal structure added to increase the overall depth of the filter. At the same time, the original rock media was replaced with the current plastic cross flow media. Water leaks from both filters where

the metal tank and the concrete base interface. The problem is much more prevalent at the original trickling filter. Plant operators have repeatedly attempted to correct the exfiltration problem by filling the joint with oakum, but this solution has only worked for short durations. At present, the trickling filters are still leaking.

Trickling filter effluent flows by gravity to the secondary clarifiers. The two rectangular clarifiers each have a 60-foot length, a 12-foot width and a side water depth of 7.5 feet each. It is noted that Ten States Standards recommends a minimum side water depth of 10 feet. The clarifiers are equipped with non-metallic collector mechanisms (collector chains, sprockets and flights) and driven by 1/2 hp motors. There are no surface skimmers for collecting floating materials, so the operators must skim the clarifiers with nets from time to time.

The secondary clarifiers have a surface area of 670 square feet, and weir length of 32 linear feet each. Based on Ten States Standards recommendations, the maximum average daily flow through the secondary clarifiers is 640,000 gpd based on a weir-loading rate of 20,000 gpd per linear foot of weir, assuming one clarifier is out of service. However, with a side water depth of 7.5 feet, the maximum recommended weir-loading rate may not be realized at these clarifiers without stress testing.

2.2.1.4. Tertiary Treatment

Tertiary treatment consists of rapid sand filtration, microfiltration, ultraviolet (UV) disinfection, and post aeration. There are also backup chlorination/de-chlorination facilities at the wastewater treatment plant.

2.2.1.4.1. Rapid Sand Filtration

A prefabricated, rapid sand filter manufactured by U.S. Filter, Inc. provides tertiary treatment for suspended solids and phosphorous removal. Secondary clarifier effluent flows by gravity to the rapid sand filter. The filter has 3 cells, each with a surface area of 87 square feet. Based on a hydraulic application rate of 4 gpm per square foot, with one cell out of service, the rapid sand filter can hydraulically treat a maximum flow of 1 mgd.

The rapid sand filter cells are backwashed at a rate of 1,040 gpm for a period of 3.5 minutes each. Each cell backwashes approximately 3 times per day, resulting in a total return flow of 32,760 gpd or approximately 10 percent of the average daily flow. The mudwell pumps are each rated at 103 gpm, with a total dynamic head of 20 feet, so backwash water is returned to the headworks over a period of 35 minutes. During the 2001 upgrade, each cell was retrofitted with a pneumatic butterfly valve on the influent feed to reduce the amount of backwash water that is returned to the equalization basins. Operators report that some of the pneumatic butterfly valves have frozen during the winter months. There is 100 percent redundancy for the low-pressure blowers, backwash pumps and mudwell pumps.

2.2.1.4.2. Microfiltration

In order to comply with the NYC Watershed Regulations, membrane microfiltration was installed during the 2001 upgrade. There are 3 membrane microfiltration units, manufactured by Pall Corporation. Each membrane system has a module rack which holds 44 modules. At a design flux rate of 23.3 gpd per square foot specified by the watershed upgrade program, each unit can treat a peak flow of 500,000 gpd. Assuming one unit is out of service, the total flow at the design flux rate is 1 mgd.

The two membrane microfiltration feed pumps are vertical sump pumps, Model No. 3171, as manufactured by Goulds Pumps, Inc. Each pump is capable of lifting 700 gpm against a total dynamic head of 44 feet. Each is equipped with a variable frequency drive. The membrane microfiltration feed well is 7 feet by 15 feet with an operating depth of 4 feet and an effective volume of 3,200 gallons.

Support systems for the membrane micofiltration system include: two air compressors with integral dryers, a 1,000 gallon receiving tank to supply air scour for membrane cleaning, a 1,400 gallon waste sump with 2 grinder pumps capable of 33 gpm at a total dynamic head of 48 feet, a 2 million BTU per hour instantaneous hot water heater, and sodium hypochlorite and sodium hydroxide chemical feed systems. Both sodium hypochlorite and sodium hydroxide are stored in 55-gallon drums in a drum containment area. Granular citric acid is used during the monthly clean-in-place (CIP) procedure to remove residue that accumulates on the microfilter fibers over time.

Each microfiltration system skid is controlled by a local control panel (LCP) with a PLC. Overall system control is performed by a supervisory PLC mounted in the electrical room. The membrane system has a mini supervisory control and data acquisition (SCADA) system that is routed through a local Ethernet. The operators are able to remotely dial into the mini SCADA system to check the status of the membranes and make process control changes.

2.2.1.4.3. UV Disinfection

Disinfection of the wastewater is accomplished by UV disinfection. Ultraviolet light within the range of 200 to 300 nanometers (nm) is known to be germicidal by disrupting the reproductive mechanism of bacteria, viruses and protozoa. There are three, In Line 1,000 UV disinfection chambers, manufactured by Aquionics, Inc. This equipment is located in the membrane microfiltration building and was installed as part of the 2001 upgrade.

Each chamber has a total of four, high intensity, medium pressure lamps that are protected from the effluent by high purity quartz sleeves. The lamps are situated perpendicular to the flow and can be removed from one end of the chamber without draining the unit. The reported headloss through the chamber is 1-inch at a flow of 1-

mgd. The UV disinfection system was designed very conservatively with a UV transmittance of 60 percent and an influent TSS concentration of 20 mg/l. At a UV transmittance of 66 percent, the system is capable of treating 1 mgd. A recirculation system provides the necessary cooling flow to allow one UV unit to remain in operation during low flow periods. This addresses concerns over lamp start time and on-off cycles that shorten lamp life.

The UV disinfection control system is comprised of a LCP for each UV disinfection chamber and a supervisory control panel that coordinates the operation of all three chambers. The supervisory control panel controls the influent and effluent valves and the recirculation system.

2.2.1.4.4. Post Aeration

Post aeration is required to raise the dissolved oxygen content of the effluent prior to discharge into Broad Brook. A cascade aeration system attached to the membrane microfiltration building accomplished this. Cascade aeration is the least costly method to raise dissolved oxygen levels in the effluent as no aeration equipment or electrical power is required. The cascade aeration system has a total fall of 5.25 feet, a 3-foot width and eight steps. The current dissolved oxygen of the effluent has been reported to be about 7 to 8 mg/l on average. The permit requires a minimum of 4 mg/l.

2.2.1.4.5. Chlorination and De-chlorination Facilities

The gas chlorination station, chlorine contact chamber and gas sulfur dioxide systems are still in place at the WWTF. These facilities were left in place, as a preventative measure, to provide additional disinfection in the event of a catastrophic failure of the membrane microfiltration system. A lockable valve controls the bypass.

The chlorine contact chamber, at the current peak flow of 1.0 mgd, has a contact time of 15 minutes. The chlorinator is a Series V-100 Mini-Chlorination Center as manufactured by Wallace & Tiernan. The system consists of a controller, two 100 lbs cylinders, two cylinder scales and an automatic switchover cylinder-mounted, vacuum regulating valve. The sulfur dioxide de-chlorination system consists of similar equipment to that of the chlorinator. There is no automation associated with the chlorination or de-chlorination systems since this system is a back up disinfection system. The backup chlorination and de-chlorination facilities have not been utilized since the UV system was brought online in 2002.

2.2.1.5. Phosphorous Chemical Precipitation

Phosphorous removal is achieved through chemical precipitation with alum in the primary and/or secondary clarifiers. Alum addition causes the pH of the primary effluent to be acidic. As a result, a sodium carbonate feed system was installed to raise the pH

prior to biological treatment in the trickling filters. Polymers can be added for additional coagulation in the secondary clarifiers prior to the rapid sand filter.

Two chemical feed pumps, as manufactured by Wallace & Tiernan, are located in the basement of the rapid sand filter building. The chemical feed systems were installed during the 1995 upgrade.

At the time of the wastewater treatment plant walk through by Malcolm Pirnie staff, the existing 6,000-gallon storage tank and alum chemical piping systems were being replaced and could not be assessed. It was reported that the 6,000-gallon storage tank was being installed with a leak detection system in compliance with 6 NYCRR 599. The new tank should provide up to 66 days of storage at a feed rate of 352 lbs per day (assuming 22 lbs of alum per 1 lbs of phosphorous) at the current average daily flow of 316,000 gpd.

Sodium carbonate (soda ash) is delivered to the site in 50 pound (lb) bags and is fed into a volumetric feeder manufactured by Wallace & Tiernan. Soda ash is mixed in a 35-gallon tank prior to storage in two 350-gallon solution storage tanks located in the basement of the rapid sand filter building. Soda ash can be added to the primary clarifier effluent or the effluent of the rapid sand filters as needed for pH control. Soda ash is not typically used by the operators as the existing wastewater buffering capacity is sufficient.

The operators have not added polymers in several years. The feed system is comprised of a Semblex Polymax polymer blending and feeding unit. Polymer can be added to the secondary clarifier. The system is reported to be in working condition and appears to be maintained.

2.2.1.6. Solids Handling

Both rapid sand filter backwash and membrane microfiltration rejected water are returned to the influent equalization basin. Secondary sludge is withdrawn from the secondary clarifiers and returned to the primary clarifiers for co-settling and removal. Primary and secondary sludge is then withdrawn from the primary clarifiers and pumped to the anaerobic digesters that are utilized as sludge holding tanks. Sludge is pumped and hauled off site for processing.

The sludge pumps are located in the basement of the Control Building adjacent to the anaerobic digesters. There are three sludge pumps and one simplex controller. Each pump is a Model No. PE61-A dual plunger type pump, as manufactured by ITT Marlow, Inc., and has a rated capacity of 57 gpm at 62 strokes per minute and 60 feet head. Each motor is 1.5 hp. The suction and discharge piping is configured such that Sludge Pump 1 has the capability to discharge primary and secondary sludge to Digester 1. Sludge Pumps 2 and 3 can discharge secondary sludge to the primary clarifiers or primary and secondary sludge to Digester 1. The sludge pumps are activated on a timed operation

controller. Only one sludge pump is in operating condition at this time. The other two sludge pumps have been scavenged for parts to keep one pump in operation.

The two anaerobic digesters each have a diameter of 20 feet and an effective depth of 23.5 feet, resulting in an internal volume of 55,000 gallons. Digester 1 has a fixed, cast in place concrete roof since it was converted from an existing Imhoff tank on-site. Digester 2, also a converted Imhoff Tank, has a fixed Type F Digester Cover, as manufactured by EIMCO Process Equipment, Inc. Digester 1 has heating coils, which feed hot water from a boiler located on the first floor of the old process control building.

Operators utilize the digesters as sludge holding tanks; supernate is returned to the equalization basins, and liquid sludge is withdrawn from the tanks and hauled to a separate site for processing. If current operations change and the tanks are operated as anaerobic digesters, the load would exceed the recommendations of Ten States Standards. The recommended loading rate for a completely mixed system is 40 lbs of volatile solids per day per 1,000 cubic feet of volume. Based on the total volume of 110,000 gallons, a total of approximately 370 lbs per day of volatile suspended solids can be wasted from the process each day. Assuming the combined primary and secondary sludge has a volatile solids content of 60 percent, a total of 610 lbs per day of sludge can be withdrawn from the primary clarifiers. Typical percent solids for the combined sludge is approximately 5 percent, indicating a flow of 1,460 gallons of combined sludge per day. Currently, at an average daily flow of 316,000 gpd, the operators are hauling, on average, 22,750 gallons per month, which is equivalent to 760 gpd of combined sludge.

There is a sludge press building which houses a one meter belt filter press, Model No. 3500, manufactured by Envirex. A polymer feed system has been installed to increase the solids content of the sludge cake. A sludge filtrate return pump station returns filtrate to the headworks. The one meter belt filter press is capable of sludge cake production between 0.75 and 1.25 yards per day. The belt filter press has not been operated for the full time production of sludge cake in several years. However, the operators have reported exercising the system occasionally.

2.2.1.7. Miscellaneous Equipment

Other equipment present at the wastewater treatment facility include the following:

- two fuel storage tanks;
- two emergency generators;
- two domestic water pumps;
- a dial out panel
- a fire panel;
- Limited SCADA system with telemetry between the Control Building, Blower Building, and Microfiltration Building.

The two fuel storage tanks were installed in 1992. Storage Tank No.2 is a 2,000-gallon tank located next to the Control Building. Storage Tank No.1 is below ground and was not viewed during inspection.

Emergency Generator No. 1 is rated for 180 kilowatts (kW), at 120/208 volt (V), three phase diesel powered Model No. 180PROZJ81 generator, manufactured by Kohler Power Systems. This generator was installed in 1992. The generator has an automatic exercise system. However, the operators manually exercise the generator weekly. There is an automatic transfer switch dedicated to the generator and this electrical service, in the event or a power failure.

The new generator was installed during the 2001 upgrade and is rated for 275 kW at 277/480 V, 3 phase standby service. This propane fired generator is a Model SD275, as manufactured by Generac Power Systems, Inc. The generator has an automatic exercise system, which exercises the generator once per week and an automatic transfer switch.

2.2.1.8. Electric Services

The WWTP has two separate electrical services that provide power to the facilities. In the 2002 upgrade a second service was installed that serves the membrane microfiltration building. This was installed for two reasons, first the existing service, located at the Control Building, did not have sufficient capacity for the membrane microfiltration equipment. Secondly, NYC DEP pays for operational and maintenance costs associated, including electricity, for equipment required to meet the Rules and Regulations for the Protection From Contamination, Degradation and Pollution of the New York City Water Supply and its Sources (NYC WR&R). Therefore, a second service for the sole purpose of the membrane microfiltration system reduces accounting effort for separating electrical costs.

The original service that feeds power to the remainder of the WWTP, is located on the exterior of the Control Building and does not meet current electrical standards as the distribution panels, transfer switches, etc. are not under cover from the weather.

2.2.2. Buildings

2.2.2.1. Preliminary Treatment

Preliminary treatment buildings include two Remote Fine Screen Buildings (Bedford Hills and Taconic), the Grit/Headworks building, the Blower building and the Screenings building.

The Remote Fine Screen buildings are each 20’ x 12’ block structures that house the rotary fine screens. These buildings were constructed during the 1986 upgrade.

The Grit/Headworks building is a two floor, 388 square foot (sq ft) structure that was constructed during the 2001 upgrade, and underwent structural rehabilitation in 2002.

The Blower building is a 12’ x 15’ brick/block structure constructed in the 1986 upgrade that houses the blowers for the equalization basin mixing system and the control systems for the vortex grit system and the influent pumping system.

The Screenings building is a 10’ x 15’ brick/block structure containing two static screens. The building was constructed in 1992.

2.2.2.2. Primary Treatment

There are no buildings associated with primary treatment.

2.2.2.3. Secondary Treatment

There are no buildings associated with secondary treatment.

2.2.2.4. Tertiary Treatment

Buildings associated with tertiary treatment include the Rapid Sand Filter building, a 15’ x 25’ brick/block structure with two floors, including a basement, constructed during the 1995 upgrade.

The Microfiltration building is an approximately 40’ x 60’ brick/block structure constructed in the 2001 upgrade. It has a reinforced concrete substructure, masonry superstructure and steel web joists for the roof framing.

Other tertiary treatment buildings include the Standby Chlorine building and De-chlorination Station. The Standby Chlorine building was constructed during the 1953 upgrade and the De-chlorination Station was installed during the 1995 upgrade. However, since the UV disinfection system has 100 percent redundancy, chlorination and de-chlorination are no longer needed and the building can be removed.

2.2.2.5. Solids Handling

The Belt Filter Press building, also known as Building No.122, is a 30’ x 20’ brick/block structure housing constructed in 1985. It has a concrete foundation, masonry superstructure and a metal deck roof.

The Control building, originally constructed during the 1953 upgrade and rehabilitated in 2002, is a 30’ brick structure with two floors (including a basement).

2.2.2.6. Other

The Maintenance Garage, constructed during the 1990s, is an approximately 20’ x 40’ steel structure primarily used for storage. There is no electrical service installed in the building, and there is no secondary containment for the storage of liquid chemicals.

2.2.3. Concrete Tanks

2.2.3.1. Preliminary Treatment

The facility has two equalization basins with effective volumes of 31,200 and 56,200 gallons, respectively. Both of these basins were upgraded in 1992. The grit chamber is a 600 gallon tank with a hydraulic detention time of 0.87 minutes and a peak hourly flow rate of 1 MGD and a headloss of 1 foot. The grit chamber was constructed in 2002. Other preliminary treatment system structures include a influent parshall flumes, a pre-cast meter pit, a pre-cast valve pit and an equalization wet well.

2.2.3.2. Primary Treatment

The facility contains two primary clarifiers with rectangular dimensions of 41’ x 14’ x 10’. Primary Clarifier #1 was constructed in 1953 and rehabilitated in 2002. Primary Clarifier #2 was constructed in 1992 and rehabilitated in 2002.

2.2.3.3. Secondary Treatment

Secondary treatment system tanks include two trickling filters and two secondary clarifiers. Trickling filter tank #1 was constructed in 1953 and rehabilitated in 1992. Trickling filter tank #2 was built in 1992. Trickling filter tank #2 is a steel tank with some concrete at its base. Trickling filter #1 was retrofitted in 1992 by adding a steel tank on top of the original concrete tank. The dimensions for the secondary clarifiers are 60’ x 12’ x 76’. Secondary Clarifier No. 1 was constructed in 1953 and rehabilitated in 2002, and Secondary Clarifier No. 2 was constructed in 2002.

2.2.3.4. Tertiary Treatment

Tertiary treatment tanks include the rapid sand filter cells, a chlorine contact tank and an aeration cascade. The rapid sand filtration cells each have a surface area of approximately 87 sq. ft and were constructed in 1992. The post aeration cascade has a fall of 5.25 feet, a 3 foot width and eight steps. It was constructed in 2002. The chlorine contact tank is a pre-cast tank installed in 1992.

2.2.3.5. Solids Handling

Solids handling tanks include two anaerobic digesters converted to storage tanks and the sludge drying bed. The sludge drying bed is no longer used. Storage tanks #1 and #2 were constructed in 1953 and 1992 respectively. The tanks are 55,000 gallon Imhoff Tanks with a 20’ diameter and a 23’6” effective depth. The north tank, storage tank #2, also had an EIMCO Type F cover during inspection.

2.2.4. Land and Easements

The property consists of approximately seven acres of land located at the intersection of Harris Road and Beaver Dam Road in the Town of Bedford, just outside the hamlet of Bedford Hills. The land slopes down to and is adjacent to Broad Creek. The property

consists of mostly small scrub brush or landscaped surfaces, is not densely vegetated and appears to have wet and marshy areas. There are two paved entrances, and the only vehicular access in the proximity is by the Saw Mill River Parkway.

Malcolm Pirnie did not independently assess the property upon which DOCS' wastewater facility is located. The property description and land value contained in this report is based on the (2010) "Valuation Analysis of Land Associated with Bedford Hills Wastewater Treatment Plant" prepared by Rand Commercial Services on behalf of HydroQual, Inc. For reference, the Rand Commercial Services report is included in ***Appendix C***.

No information was available regarding easements for buried infrastructure, catch basins, or other related land assets; therefore, a description for any such easements is not provided and the value of any such easements is not included in the estimated facility valuation.

3. Condition of Facilities

3.1. Purpose of the Condition Assessment

This section of the report provides an overview of the current condition of DOCS' wastewater facilities. The condition of the assets was used to estimate the remaining useful life of DOCS' facilities, the value of the system, and the anticipated future capital reinvestment that may be required. A limited physical inspection of the system was conducted as part of this study. The condition assessment is based upon assumptions related to the relative age of the system.

3.2. Condition Assessment Approach

The condition assessment was performed based on the compilation of existing information provided by DOCS, a limited site inspection at the wastewater treatment facility, previous knowledge of the wastewater system and document reviews. The review of documents focused primarily on the following key documents and information:

- Regulatory compliance records
- Operation and maintenance records
- System maps

The wastewater treatment system assets were rated on overall asset condition. The Asset Condition Rating provides a rating for the overall physical condition of the facility system, operational condition of the system and addresses the condition of equipment, condition of structures and recent improvements. Each asset was assigned an Asset Condition Rating based on the scale shown in Table 3-1. Additional details on the physical condition criteria and ranking guidelines used for discrete asset groupings is included in ***Appendix D***.

Table 3-1:
Summary of the General Asset Rating System

Asset Condition Assessment Rating Scale

GRADE	CONDITION	DESCRIPTION
0	Abandoned	Asset abandoned, no longer in use, or no longer exists
1	Very Good	Sound physical condition. Meets current needs. Operable and well-maintained. Asset expected to perform adequately with routine maintenance for 10 yr or more. No work required.
2	Good	Acceptable physical condition. Shows minor wear that has minimal impact on performance. Minimal short-term failure risk. Potential for deterioration or impaired performance over next 5-10 years. Minor work (if any) required.
3	Fair	Functionally sound but showing wear and diminished performance. Moderate short-term failure risk. Potential for further deterioration and diminished performance within next 5 years. Renewal or major component replacement expected within next 5 years. Minor work required but asset is serviceable.
4	Poor	Asset functions but requires high level of maintenance to remain operable. High risk of short-term failure. Likely to have significant deterioration in performance within next 2 years. Renewal or replacement expected within next 2 years. Substantial work required, asset barely serviceable.
5	Very Poor	Asset failed or failure is imminent. Excessive maintenance required. No further service life expectancy. Significant health and safety hazard. Major work or replacement is urgent.

Source: Association of Metropolitan Sewerage Authorities, "Managing Public Infrastructure Assets," 2002

3.3. On-site Inspection

Malcolm Pirnie staff conducted a one-day on-site inspection of the Bedford Hills Correctional Facility wastewater treatment plant on July 22, 2010. The individual asset condition assessment data sheets completed at the site inspection can be found in ***Appendix E.*** The asset condition assessment summary tables can be found in ***Appendix H***. The inspection of the physical condition of the facilities was based on visual observation and operator interviews only, no destructive testing or operation of equipment was conducted.

3.4. Condition Assessment of Facilities

The following section provides a description of the condition assessment for each major wastewater process and asset category. Assets identified as "Not Rated" in the summary tables (***Appendix H***) were excluded. As shown in Table 3-2, the overall condition of DOCS' wastewater facility is considered "good to fair". This table shows a blended rating of the equipment and the support facilities (i.e. buildings) for each facility process.

Table 3-2:
Summary of Facility Condition Rating by Process

Facility Process	Overall Asset Condition Rating	
	Numerical Rating	Condition Description
Preliminary Treatment	2.0	Good
Primary Treatment	1.8	Very Good to Good
Secondary Treatment	3.4	Fair to Poor
Tertiary Treatment	2.3	Good to Fair
Solids Handling	2.6	Good to Fair
Other	2.0	Good
Facility Average:	**2.3**	**Good to Fair**

3.4.1. Equipment

The equipment at DOCS' wastewater facility is generally considered to be in "good to fair" condition, as shown in Table 3-3. A summary of the condition assessment comments relative to DOCS' wastewater equipment is included in ***Appendix B***.

Table 3-3:
Summary of Equipment Condition Rating

Equipment	Overall Asset Condition Rating	
	Numerical Rating	Condition Description
Preliminary Treatment	2.4	Good to Fair
Primary Treatment	2.0	Good
Secondary Treatment	3.3	Fair to Poor
Tertiary Treatment	2.4	Good to Fair
Solids Handling	3.7	Fair to Poor
Other	2.1	Good to Fair
Equipment Average:	**2.7**	**Good to Fair**

3.4.1.1. Preliminary Treatment

The equipment used for preliminary treatment is generally considered to be in "good" to condition, with the following exceptions. The coarse bubble diffusers for equalization basin No. 2 and both static screens are considered to be in "poor" condition. Some of the diffusers appear to be either clogged or corroded through based on the surface visible air

flow pattern in the equalization basin. The existing static screen is not currently required as screening is accomplished remotely at each correctional facility. The parshall flumes were not in service due to hydraulic problems and the influent pump No. 3 was in need of motor repair.

3.4.1.2. Primary Treatment

Each primary clarifier was rated as "good", however, it should be noted that the rotary scum skimmer needs to be replaced on both primary clarifiers.

3.4.1.3. Secondary Treatment

Most of the equipment used for secondary treatment is considered to be in "good" condition, with the following exceptions. The trickling filter, trickling filter feed pumps, trickling filter recycle pumps, trickling filter No. 2 distributor arm and tickling filter wall panels are considered to be in "fair" condition. Trickling filter No. 1 distributor arm and the secondary clarifier No. 1 flight and drive are considered to be in "poor" condition. Both tickling filter blowers are in "very poor" condition.

The trickling filters were rated as "fair" due to seepage from the gasket material between the glass line steel panels and the concrete base. As discussed operators continually fill the void with oakum, but this is only a temporary fix. The trickling filter recycle and feed pumps were rated as "fair" due to surface corrosion and a slight vibration noticed in the pumps. Trickling filter No. 2 distribution arm was rated as "fair" due to surface corrosion observed on the arms. Trickling filter No. 1 distribution arm was rated as "poor" due to plugged orifices, uneven flow distribution and the distribution arm not rotating at the time of the inspection. The flight and drive for secondary clarifier No. 1 was inoperable at the time of the inspection and needed to be replaced. Both existing trickling filter blowers are inoperable and have not been operated in sometime per the operators. Air flow through the trickling filter appears sufficient under current loads as treatment is not impacted by a lack of oxygen through the trickling filter.

3.4.1.4. Tertiary Treatment

The equipment used for tertiary treatment is considered to be in "good" condition with the exception of rapid sand filter no. 2 and the standby chlorination and de-chlorination systems, which are deemed to be in "fair", "poor" and "very poor" condition, respectively.

Rapid sand filter No. 2 has significant surface corrosion on the steel tank and the underdrain has failed and needs to be replaced. At the time of the inspection this unit was out of service due to required repairs. The standby chlorination and de-chlorination system was left in place after the 2002 upgrade as a backup to the UV disinfection system, but has not been used since the UV system was place into service. Typically

most WWTPs do not have backup chlorination and de-chlorination systems when redundant UV disinfection reactors are in place.

3.4.1.5. Solids Handling

The belt filter press, digester No. 1 mixer and digester No. 2 are in "good" to "fair" condition; however, the remaining equipment associated with the solids handling process is in "poor" to "very poor" condition. Additionally, of the three sludge pumps, one is in "very poor" condition and the other two are out of service.

Since the operators currently haul sludge to a regional WWTP for processing, the existing anaerobic digesters have been converted into sludge holding tanks and sludge dewatering discontinued. The existing belt filter press and polymer systems have not been operated in some time. Of the three existing sludge pumps only one is operational as parts from the other two were scavenged for the last remaining sludge pump in operation.

3.4.1.6. Other

Some equipment, including the SCADA system, the dial out panel and the fire panel, are in "very good" condition. The emergency generators and domestic water pumps are in "good" condition. One of the storage tanks for fuel oil is in "very poor" condition.

3.4.2. Buildings

Malcolm Pirnie performed a preliminary code investigation of the existing buildings and building systems on-site as part of the 2003 *Sanitary Sewer Extension and Plant Capacity Analysis*. The buildings were revisited during the 2010 site visit to update or confirm the 2003 condition analysis.

The buildings associated with DOCS' wastewater facility are generally considered to be in "good to fair" condition, as shown in Table 3-4.

Table 3-4:
Summary of Buildings Condition Rating

	Overall Asset Condition Rating	
Buildings	**Numerical Rating**	**Condition Description**
Preliminary Treatment	2.2	Good to Fair
Primary Treatment	N/A	N/A
Secondary Treatment	N/A	N/A
Tertiary Treatment	2.5	Good to Fair
Solids Handling	2.0	Good
Other	3.0	Fair
Buildings Average:	**2.4**	**Good to Fair**

3.4.2.1. Preliminary Treatment

The Grit/Headworks building was constructed in 2002. This building is deemed to be in "very good" condition.

The Bedford Remote Fine Screen building is considered to be in "good" condition and the Taconic Remote Fine Screen building in "fair" condition. The Screenings building is considered to be in "good" condition.

The Blower building is considered to be in "fair" condition. The following deficiencies were noted: abandoned field devices and electrical equipment are located in the blower room; there is no ventilation system or air conditioning in the control room; steel windows and doors are rusting and require painting or replacement.

3.4.2.2. Primary Treatment

There are no buildings associated with primary treatment.

3.4.2.3. Secondary Treatment

There are no buildings associated with secondary treatment.

3.4.2.4. Tertiary Treatment

The Rapid Sand Filter building and the Microfiltration building are in "good" condition. However, the following deficiencies were noted.

In the Rapid Sand Filter building, the stairs are not enclosed in fire rated walls and contain open treads and risers; it is not ADA compliant; paint is peeling in the basement due to harsh and damp environment; no ventilation system has been included in the basement.

In the Microfiltration building, the chemical storage area and the emergency shower and eyewash stations are no located adjacent to each other and the path of egress is less than 36-inches wide; concrete cracking has occurred near the corners of the building.

The De-chlorination Station and the Standby Chlorine Building are considered to be in "fair" condition.

3.4.2.5. Solids Handling

The Belt Filter Press building is deemed to be in "good" condition but some deficiencies were noted: the building is not ADA compliant and no odor control is available.

The Control building is in "fair" condition and the following deficiencies were noted: the building is not ADA or NFPA 820 compliant; windows and doors need to be replaced; the stairs are not enclosed in fire rated walls and contain open treads and risers; the main electrical services are mounted on the exterior of the building.

3.4.2.6. Other

The Maintenance Garage is in "fair" condition. It should be noted that there is no electrical service installed in the building. An electrical service was run from the Microfiltration building to the Maintenance Garage in during the 2001 upgrade, but no lighting or electrical outlets have been installed. There is no secondary containment for the storage of liquid chemicals.

3.4.3. Concrete Tanks

The concrete tanks associated with DOCS' wastewater facility are generally considered to be in "good" condition as shown in Table 3-5.

Table 3-5:
Summary of Concrete Tanks Condition Rating

	Overall Asset Condition Rating	
Concrete Tanks	**Numerical Rating**	**Condition Description**
Preliminary Treatment	1.3	Very Good to Good
Primary Treatment	1.5	Very Good to Good
Secondary Treatment	3.5	Fair to Poor
Tertiary Treatment	2.0	Good
Solids Handling	2.0	Good
Other	1.0	Very Good
Concrete Tanks Average:	**1.9**	**Very Good to Good**

3.4.3.1. Preliminary Treatment

Concrete tanks associated with preliminary treatment are considered to be in "very good" condition with the exception of the valve pit, which was deemed to be in "fair" condition.

3.4.3.2. Primary Treatment

Primary clarifier No. 1 is considered to be in "very good" condition; primary clarifier No. 2 is considered to be in "good" condition.

3.4.3.3. Secondary Treatment

The majority of concrete tanks associated with secondary treatment are considered to be in "fair" condition. Both of the secondary clarifiers are deemed to be in "poor" condition.

3.4.3.4. Tertiary Treatment

The rapid sand filter tank, chlorine contact tank and the aeration cascade are deemed to be in "good" condition.

3.4.3.5. Solids Handling

Both storage tanks are deemed to be in "good" condition.

3.4.3.6. Other

The various concrete pads located around the WWTP are in "very good" condition.

3.4.4. Land and Easements

Malcolm Pirnie did not independently assess the property upon which DOCS' wastewater facility is located. The property description and land value contained in this report is based on the (2010) "Valuation Analysis of Land Associated with Bedford Hills Wastewater Treatment Plant" prepared by Rand Commercial Services on behalf of HydroQual, Inc. For reference, the Rand Commercial Services report is included in ***Appendix C***.

No information was available regarding easements for buried infrastructure, catch basins, or other related land assets; therefore, the condition of any such easements is not known and the value of any such easements is not included in the estimated facility valuation.

4. Valuation of Facilities

This section describes the valuation approach used to determine the estimated value of DOCS' wastewater system assets, and provides an estimate of system value.

4.1. Valuation Approach

Three generally accepted methods are used in the valuation of assets: the Cost Approach, the Sales Comparison Approach, and the Income Capitalization Approach. Given that the Town is considering acquiring, leasing or otherwise transferring all or part of DOCS' wastewater assets to the Town, Malcolm Pirnie utilized a modified Cost Approach to estimate the net book value (original cost less accumulated depreciation) and replacement cost new less depreciation value of DOCS' wastewater system assets.

The replacement cost new less depreciation method assesses the potential value of system assets by subtracting the accumulated depreciation from the estimated replacement cost of all assets in service. This method is also typically used to establish a baseline of potential value for determining the feasibility of system acquisition, particularly when information about the system is limited.

The original cost less accumulated depreciation method assesses the potential value of the system based on net book value. This method provides a lower end of potential value when the utility system rates are regulated, and rates are based on a rate base that considers the asset's original cost, rather than replacement cost. This method also may include adjustments for system condition, engineering design and construction standards, non-used and useful assets, excess capacity, and going concern value. We understand that the Town intends to use the net book value, as documented in this report, as a basis for a negotiated sale, franchise, long term lease or other structure to transfer the responsibility of these assets.

In general, the modified cost approach involved estimating the cost of replacing the assets at current costs (2010 dollars) and adjusting the cost by applying cost indices to estimate the original cost of the assets, and depreciation factors to reflect the estimated age and condition of the assets. The modified cost approach used to value the assets involved the following steps:

1. Development of an asset inventory

2. Estimation of asset replacement cost new

3. Estimation of original cost

4. Estimation of accumulated depreciation

5. Calculation of original cost less depreciation and replacement cost new less depreciation values.

4.1.1. Asset Inventory

An asset inventory was compiled based on information gathered from DOCS. A description of the assets included in the valuation is provided in Section 2 of this report. A tabular summary of the asset inventory is included in ***Appendix A*** of this report.

4.1.2. Replacement Cost New (RCN)

The replacement cost new (RCN) value represents the cost of replacing an asset with a new asset that provides an equivalent utility (i.e., an asset that provides the same function and benefit as the existing asset).

A summary of the estimated replacement cost new for each asset type is provided at the end of this section. A summary of the calculations supporting the estimated replacement cost new for each individual asset is included in ***Appendix F***.

4.1.3. Asset Original Cost

The assets original cost values were determined by deflating the replacement cost values to the estimated year of construction by applying a construction cost index to the replacement cost values. The Engineering News Record, Inc. (ENR) construction cost index was used as the cost index. Given the age of DOCS' wastewater infrastructure, original (historical) installation dates were not available for many of the assets. Therefore, the year of construction, and corresponding age of the assets was estimated based upon information obtained from DOCS and summarized in Section 2 of this report. In determining the asset original cost of those facilities without a known construction year, the year of original construction or the year of an asset's most recent major rehabilitation of the facility was used.

A summary of the estimated asset original cost for each asset type is provided at the end of this section.

4.1.4. Accumulated Depreciation

Approximate useful lives were assigned to each asset class based upon limited inspection of the assets, resulting condition assessment ratings, and functional longevity for materials and asset classes recognized in the industry. A summary of the useful lives for discrete asset classes and associated depreciation percentages based on condition assessment ratings is included in ***Appendix G***. The replacement cost new and original

cost values were adjusted for accumulated depreciation using a straight line method. A summary of the estimated accumulated depreciation for each asset type is provided at the end of this section.

4.1.5. Original Cost Less Depreciation (OCLD) Value

The original cost less accumulated depreciation value, or net book value, was estimated by subtracting the accumulated depreciation from the estimate of original asset cost. A summary of the estimated OCLD value for each asset type is provided at the end of this section.

4.1.6. Replacement Cost New Less Depreciation (RCNLD) Values

The replacement cost new less accumulated depreciation value was estimated by subtracting the indexed accumulated depreciation from the estimate of asset replacement cost. A summary of the estimated RCNLD value for each asset type is provided at the end of this section.

4.2. Estimated Value of Wastewater System

Based on the review and analysis of available asset information, and to the best of our knowledge, information and belief, it is estimated that the net replacement value less depreciation value of DOCS' wastewater treatment system as defined in this report is approximately $11.5 million. Furthermore, it is estimated that the original cost less depreciation value (net book value) of DOCS' wastewater treatment system is approximately $8 million, as summarized in the table below.

Table 4-1:
Summary of Estimated Asset Valuation

Asset Category	Replacement Cost New (RCN)	Replacement Cost New Less Depreciation (RCNLD)	Original Cost (OC)	Original Cost Less Depreciation (OCNLD)
Equipment	$ 6,546,000	$ 3,462,000	$ 4,268,000	$ 2,320,000
Buildings	6,244,000	5,236,000	4,123,000	3,517,000
Concrete Tanks	1,087,000	864,000	596,000	478,000
Site Work	1,041,000	717,000	674,000	474,000
Land	1,200,000	1,200,000	1,200,000	1,200,000
Total	**$ 16,118,000**	**$ 11,479,000**	**$ 10,861,000**	**$ 7,989,000**

NOTE: Valuation does not reflect current wastewater debt or grants used to fund asset construction.
Land value provided by Rand Commercial Realty, as cited in the HydroQual Memorandum dated May 2010.

The estimated values represent the physical asset value of the wastewater system with no consideration as to how any existing debt would be handled in the event of a sale, lease, franchise or other method of transferring the assets. Additionally, no information was provided relative to any grant funding used to fund system construction and/or rehabilitation and replacement, and the amount of grant funding could impact the transaction price.

Furthermore, it is not known whether the wastewater facility will satisfy Town construction standards (e.g., code compliance, health and safety, building specifications). There may be differences in construction standards used by DOCS and the standards employed by the Town, and these differences may affect the value of the wastewater assets for the Town.

While the estimates and assumptions utilized in this report are reasonable given the available information, the value estimate was prepared with limited asset specific information (e.g., age and original cost), and with limited condition data. Differences between the actual quantity and condition of the assets and the estimates and assumptions employed in this report may have a material impact on the estimate of value. As such, we take no responsibility for the accuracy of data provided by or prepared on behalf of DOCS or the Town. The calculations supporting the estimated asset valuation are included in ***Appendix H***.

5. Facility Expansion Alternative Update

5.1. Impact of Proposed Lower Nutrient Limits

The wastewater treatment facility is permitted to discharge treated effluent through the New York State Pollution Discharge Elimination System (NY SPDES) as administered by the New York State Department of Environmental Conversation (NYS DEC). Due to the location of the wastewater treatment plant, it is subject to both 6 NYCRR Part 750 and the Rules and Regulations for the Protection From Contamination, Degradation and Pollution of the New York City Water Supply and its Sources (NYC WR&R). The NYC WR&R §18-36(d)(2)(i) prohibits the expansion of an existing wastewater treatment system within the 60-day time of travel in the Croton watershed, however, in accordance with NYC WR&R §18-61, the New York City Department of Environmental Protection (NYC DEP) may grant a variance from the requirements of the NYC WR&R.

WR&R §18-36(e)(1) states that NYC DEP may allow a wastewater treatment plant to be expanded in the Croton System. WR&R §18-61(e)(3)(ii) indicates that the discharge limit for total phosphorous will be 0.1 milligram per liter (mg/l). The current NY SPDES permit contains a discharge limit of 0.2 mg/l for total phosphorous.

The current NYS SPDES permit does not have a specific discharge limit for ammonia; however, it requires the operators to sample and analyze the effluent for ammonia in order to develop a limit in the future. The *Sanitary Sewer Extension and Plant Capacity Analysis*, as prepared by Malcolm Pirnie and dated June 2003, indicated the anticipated limitation for ammonia to be 1.5 mg/l, based on effluent concentration data reviewed between January 2001 and December 2002. To date there has been no indication from NYS DEC on what the actual ammonia discharge limit will be in the future.

5.1.1. Historical Nutrient Removal

Malcolm Pirnie reviewed Discharge Monitoring Reports (DMRs) provided by DOCS for the wastewater treatment facility between the period of January 2007 and November 2009. During that time, there were no exceedances of the current total phosphorous discharge limit of 0.2 mg/l. Table 5-1 shows the effluent concentration data for total phosphorous and ammonia (as NH_3), as reported on the DMRs. The total phosphorous effluent concentration is typically 0.1 mg/l, with only one result greater than 0.1 mg/l in March of 2007.

Table 5-1:
Effluent Nutrient Concentrations

	Total Phosphorous (mg/l)			Ammonia (mg/l)		
	2007	**2008**	**2009**	**2007**	**2008**	**2009**
January	0.09	0.1	0.1	0.8	<0.5	0.6
February	0.09	0.1	0.1	0.65	<0.5	0.65
March	0.2	0.1	0.1	<0.5	<0.5	1.25
April	0.1	0.1	0.1	<0.5	1.75	<0.5
May	0.1	0.1	0.1	<0.5	<0.5	1.1
June	0.1	0.1	0.1	2.15	0.85	<0.5
July	0.1	0.1	0.1	2.6	<0.5	<0.5
August	0.1	0.1	0.1	<0.5	<0.5	<0.5
September	0.1	0.1	0.1	<0.5	1.05	<0.5
October	0.1	0.1	0.1	<0.5	1	<0.5
November	0.2	0.1	0.1	0.55	2.7	<0.5
December	0.1	0.1	NA	2.05	1.9	NA
Annual Average	**0.115**	**0.1**	**0.1**	**0.98**	**1.02**	**0.64**

[1] Results reported below the detection limit are assumed to be at the detection limit reported.

5.1.2. Future Treatment of Nutrients

Based on the draft language pertaining to a variance of NYC WR&R §18-36(d)(2)(i), it is apparent that the discharge limit for total phosphorous will be 0.1 mg/l. It is not clear what the discharge limit for ammonia will be, at this time. The wastewater treatment plant configuration recommended in the *Sanitary Sewer Extension and Plant Capacity Analysis* is to add second stage nitrification with rotating biological contactors (RBCs) to the existing trickling filters. These RBCs were sized with 1-million square feet of media per shaft and a total of four shafts. In accordance with the *Recommended Standards for Wastewater Facilities* (10 States Standards), this second stage nitrification RBCs is designed with one shaft out of service. The RBCs are conservatively conceptually designed to meet an effluent ammonia discharge limit of 1.5 mg/l. If the actual limit proposed by NYS DEC is less than 1.5 mg/l, the ammonia removal strategy will need to be revisited.

To maintain a total phosphorous effluent discharge limit of 0.1 mg/l, typically chemical precipitation with tertiary filtration is utilized. Chemical precipitation with either alum or ferric chloride can reduce the total phosphorous by 95 percent. However, with a theoretical total phosphorous influent concentration of 10 mg/l, the wastewater treatment

plant will be required to consistently remove 99 percent. No additional filtration will need to be added to supplement the sand filters and the microfiltration systems already included in the expansion improvements outlined in the *Sanitary Sewer Extension and Plant Capacity Analysis*. However, assuming a theoretical requirement of 22 pounds (lbs) of alum for each pound of total phosphorous required to be removed, a total of 1,760 lbs per day of alum will be used on average. 48 percent liquid alum contains approximately 5.43 lbs of dry alum per gallon. Therefore, a total of 324 gallons of 48% liquid alum will be used per day during average conditions. The existing alum storage tank is currently being replaced with a new 6,000 gallon, double walled, underground storage tank equipped with leak detection. At a feed rate 324 gallons of alum per day, the 6,000 gallon storage tank provides approximately 18 days of storage. Ten States Standards recommends 30 days of storage for chemicals, therefore additional storage may be required; however, 4,000 gallon deliveries are typical, so three deliveries per month will be required.

5.2. Updated Cost Estimates for Plant Expansion and New Town Collection System

5.2.1. Construction Costs

An opinion of the probable costs for constructing the proposed sewage collection system and expanding the existing WWTP was previously prepared by Malcolm Pirnie (*Sanitary Sewer Extension and Plant Capacity Analysis*, July 2003). These costs have been updated to reflect current bidding environment. Costs were primarily adjusted based on the Engineering News Record (ENR) Construction Cost Index (CCI) and now reflect 2011 costs. An updated estimate for rock excavation is also included. Details of the cost estimate update are presented in Tables 5-2 and 5-3, respectively. All costs shown in these tables are estimated on the basis of the conceptual designs discussed in Section 4 of the report referenced herein and historic prices for similar projects in the area.

Table 5-2:
Opinion of Probable Construction Costs for Wastewater Collection System

OPINION OF PROBABLE CONSTRUCTION COSTS WASTEWATER COLLECTION SYSTEM			
Description	**Quantity**	**Unit Cost**	**Total**
8 and 10 inch PVC Sewer	107,400 L.F.	$123 / L.F.	$13,221,000
48-inch Precast Manholes	447	$3,115 ea.	$1,392,000
6-inch Service Laterals	1,500	$1,246 ea.	$1,869,000
Pump Sta. A	1	L.S.	$349,000
Pump Sta. A, 4-inch Forcemain	1,400 L.F.	$100 / L.F.	$140,000
Pump Sta. B	1	L.S.	$374,000
Pump Sta. B, 4-inch Forcemain	920 L.F.	$100 / L.F.	$92,000
Pump Sta. C	1	L.S.	$498,000
Pump Sta. C, 8-inch Forcemain	8,700 L.F.	$165 / L.F.	$1,439,000
Pump Sta. D	1	L.S.	$467,000
Pump Sta. D, 10-inch Forcemain	1,300 L.F.	$162 / L.F.	$211,000
Pump Sta. E	1	L.S.	$343,000
Pump Sta. E, 8-inch Forcemain	2,450 L.F.	$137 / L.F.	$336,000
Pump Sta. F	1	L.S.	$280,000
Pump Sta. F, 5-inch Forcemain	2,600 L.F.	$112 / L.F.	$292,000
RR and Major Highway Crossings	1,300 L.F.	$623 / L.F.	$810,000
Grinder Pump Units	20	$11,214 ea.	$224,000
1-1/4 inch Pressure Sewer	1,200 L.F.	$37 / L.F.	$45,000
Air Relief Structures and Valves	6	$3,738 ea.	$22,000
Valve Boxes and Valves	6	$3,987 ea.	$24,000
Rock Excavation	20,000 C.Y.	$130 / C.Y.	$2,600,000
Allowance for Utility Relocation		L.S.	$312,000
Probable Construction Cost			**$25,339,000**

Table 5-3:
Opinion of Probable Construction Costs for Expanded Wastewater Treatment Plant

OPINION OF PROBABLE CONSTRUCTION COST
EXPANSION OF WASTEWATER TREATMENT PLANT

Description	Quantity	Unit Cost		Total
General Conditions	L.S.			$500,000
Influent Flow Meter	L.S.			$100,000
Influent Screens	L.S.			$170,000
Vortex Grit Chamber	L.S.			$210,000
Equalization Basins	L.S.			$750,000
Influent Pumps	L.S.			$105,000
Primary Clarifiers	L.S.			$410,000
Rotating Biological Contactors	L.S.			$2,355,000
Secondary Clarifiers	L.S.			$450,000
Rapid Sand Filters	L.S.			$540,000
Microfiltration	L.S.			$1,115,000
Headworks Building	1800 S.F.	$312	/S.F.	$560,000
Microfiltration Building	1800 S.F.	$312	/S.F.	$560,000
Electrical Building	500 S.F.	$312	/S.F.	$155,000
Demolition Work	L.S.			$625,000
Electrical Upgrade	L.S.			$750,000
SCADA Upgrade	L.S.			$250,000
Control Building Renovation	L.S.			$125,000
Maintenance of Flow	L.S.			$125,000
Probable Construction Cost				**$9,855,000.00**

Exclusive of grants and financial contributions from the Department of Corrections Services, New York State Environmental Facilities Corporation, and New York City Department of Environmental Protection.

As noted in Table 5-2 the probable cost for constructing the sewage collection system and pumping stations is estimated at approximately $25,339,000. Of this amount, approximately $23,200,000 is for the construction of the gravity sewers, force mains and pumping stations. The remaining $2,139,000 is for grinder units and pressure lines to serve properties too low to drain by gravity to the sewers and service laterals to the sewers or grinder units. It does not include the cost of constructing the connections from

homes or other buildings to the ends of the service laterals at a grinder pumping unit or the property line or of abandoning existing septic systems. These costs are typically borne directly by the property owner, who must arrange with a local contractor for his connection to the service lateral and for having his septic tank pumped out and removed or filled with sand and gravel.

The probable cost of expanding the existing WWTP at DOCS' facilities is shown in Table 5-3 to be approximately $9,855,000. The total construction cost for the sewage collection system and plant expansion is estimated at approximately $35,200,000.

5.2.2. Project Costs

Construction costs are only a part of the total capital expenditures incurred in establishing a new sewer district and building a sewerage system. Other necessary capital expenditures include, but are not limited to the following;

- Engineering design costs, including mapping, conducting a soil boring program, facilities planning, design and permitting, assistance in obtaining bids, and administering the construction contracts, conducting field oversight of the work, preparation of record documents, and operation and maintenance manuals.
- Land acquisition costs including purchase costs for pumping station sites and for easements for sewers that cross privately owned property.
- Legal and financing costs including fees for assisting in the establishment of the sewer district, preparing and filing deeds and easement descriptions, underwriting bonds issued for long term financing, and interest incurred on bond anticipation notes issued to pay for construction.
- Administrative costs incurred by the town in attending meetings, reviewing State Environmental Review Act documents, negotiating with state agencies, and similar, time and effort consuming activities.

The total capital cost for a project includes all of the above items plus an allowance for construction contingencies and is traditionally referred to as the "Total Project Cost". An opinion of the Total Project Cost for the proposed Bedford Project is presented in Table 5-4. As shown in this table, the probable total project cost of the project is estimated at $54,300,000. This figure does not take into account any grants or other financial assistance which will be available. It is presented to show the maximum amount of money that is anticipated to be expended on the project by the time it is completed and ready to be placed in service.

Table 5-4:
Opinion of Probable Project Cost

OPINION OF PROBABLE PROJECT COST	
Item	**Probable Cost**
Construction of Sewage Collection System	$25,339,000
Expansion of WWTF	$9,855,000
Subtotal, Construction Cost	**$35,194,000**
Construction Contingencies @ 20%	$7,400,000
Land Acquisition	$1,200,000
Engineering	$8,000,000
Legal and Administrative	$520,000
Interest During Construction	$1,500,000
Bonding and other Financing Costs	$450,000
Total Estimated Project Cost	**$54,264,000**

Exclusive of grants and financial contributions from the Department of Corrections Services, New York State Environmental Facilities Corporation, and New York City Department of Environmental Protection.

5.2.3. Operation and Maintenance Costs

Once the new sewerage system is placed in operation, the Town Sewer District will be responsible for operating and maintaining it. Operation and maintenance (O&M) costs include labor, electrical power, treatment chemicals, spare parts, the cost of contractual services such as telephone lines and alarm system monitoring services, consumable supplies and similar expenses. Typically, the cost of operating and maintaining a gravity sewer system is relatively low, especially when the system is new, and averages less than $600 per year per mile of pipe. O&M costs for sewers and grinder pumps are usually limited to replacing occasional broken manhole covers and responding to alarms at grinder pumping units and to homeowner complaints about clogged or plugged service laterals, and similar work.

Estimated O&M costs for the six wastewater pumping stations are shown in Table 5-5. This estimate is based on the assumption that each of the pumping stations will be visited by an operator 5 times per week, and that routine work such as mowing the lawn around the stations, recording flows from the flow meters, checking pumps, controls and the standby electrical generating system and cleaning the bar screens can be done by one, full-time operator. Non-routine work such as replacing pump seals or malfunctioning equipment is assumed to require ten man-days per year. Spare parts and consumable supplies are estimated at $10,000 per year for all six stations.

Table 5-5:
Estimated Sewage Collection System O&M Cost for the Initial Year of Operation

Description	Quantity	Unit Cost	Total
Sewer Maintenance	20 miles	$600/mile	$12,000
Pumping Station Power Costs	240,000 kw-hr/yr	$0.10	24,000
Pumping Station Labor Cost	2,000 man-hours/yr	$32.00/hr	64,000
Spare Parts and Consumables		L.S.	10,000
Misc. Tools, Truck, etc.		L.S.	2,000
Total Estimated Annual Cost			**$112,000**

The estimated O&M cost for the wastewater treatment plant is shown in Table 5-6. As shown in this table, the first year of operating and maintaining the treatment plant is estimated to be approximately $922,400. However, this cost will be shared by the Town and the DOCS, and some of the costs attributable to microfiltration, required by the WR&R, will be reimbursed by the NYC DEP. DOCS' current operating costs are in the range of $400,000 to $500,000 per year.

The total O&M costs for the first year of operation of the new system is estimated at approximately $1,034,400.

Table 5-6:
Opinion of Probable Annual Operation and Maintenance Costs

Electrical Costs	**Flow (MDG)**	**Electrical Consumption (1000 kWh/yr)**	**Unit Cost ($/kWh)**	**Annual Cost ($/yr)**
Influent Pumps	1	50	$0.11	$5,500
Trickling Filter Feed Pumps	1	60	$0.11	$6,600
Membrane Header Pumps	1	30	$0.11	$3,300
Membrane Feed Pumps	1	130	$0.11	$14,300
RBCs	1	261	$0.11	$28,700
Misc. Plant Process	1	300	$0.11	$33,000
			Subtotal	**$91,400**

Chemical Costs	**Average Dosage (mg/l)**	**Average Flow (MGD)**	**Percent Solution (%)**	**Unit**	**Average Usage (unit/day)**	**Unit Cost ($/unit)**	**Annual Cost ($/yr)**
Alum	206	1	na	Lbs.	1,720	$0.17	$106,700
Polymer	5	1	na	Lbs.	42	$4.26	$65,300
Sodium Carbonate	10	1	na	Lbs.	85	$0.22	$6,800
CIP							
Sodium Hydroxide	na	1	na	Lbs.	12	$0.22	$1,000
Sodium Hypochlorite	na	1	12.0%	Gal.	1.2	$1.78	$800
Citric Acid	na	1	na	Lbs.	10	$1.14	$4,100
					Subtotal	**$184,700**	

Personnel Costs	**No.**	**Personnel Salary ($/yr)**	**Benefits ($/yr)**	**Annual Cost ($/yr)**
Chief Operator	1	$75,000	$37,500	$112,500
Shift Operator	1	$60,000	$30,000	$90,000
Maintenance	1	$50,000	$25,000	$75,000
Laborer	1	$45,000	$22,500	$67,500
			Subtotal	**$345,000**

Miscellaneous Costs	**Basis of Cost**	**Annual Cost ($/yr)**
Equipment Parts	2.5% of Total Equipment Value of $2,000,000	$50,000
Service Contracts	10% of Electrical, Chemical and Personnel Costs	$62,100
Vehicles	2 Vehicles @ 20,000 miles/yr and $0.50/mile	$20,000
Administration Supplies	1% of Electrical, Chemical and Personnel Costs	$6,200
Sludge Hauling	110,000 gallons per month @ $0.12 per gallon	$132,000
Miscellaneous	5% of Electrical, Chemical and Personnel Costs	$31,000
	Subtotal	**$301,300**
Summary		
	Annual O&M Budget	**$922,400**

The Memorandum of Agreement requires NYC DEP to pay for any added annual expenses related to operation and maintaining advanced treatment processes at those plants that must install them to comply with WR&R. Thus, the costs associated with operating the microfiltration units at the DOCS' wastewater treatment facility are paid for by the NYC DEP, and it is expected that the NYC DEP will reimburse the Town sewer district for the cost of operating and maintaining the advanced treatment processes necessary to serve the Town as part of the proposed plant expansion. This, plus payments from DOCS for treating wastewater from the Bedford Hills and Taconic Correctional Facilities and from New York State for treating the wastewater from the I-684 rest area will result in a reduction in the annual O&M costs borne by the property owners in the proposed sewer district.

In order to estimate the share of the O&M cost that will be borne by sewer users in the proposed new Town district, it has been assumed that DOCS will contribute at least as much toward the O&M costs as it is paying to operate the plant. The DOCS budget for 2003 showed a cost of approximately $430,000. A current O&M budget was requested from DOC's but did not appear comprehensive and was lower ($380,000) than the 2003 budget. Hence, as a means to estimate their contribution, a flow-based approach was used. We estimated $922,000 per year for a total flow of 1 mgd and the DOCS capacity reserve is 450,000 gpd. Therefore, their portion of the plant's O&M cost would be approximately $415,000 ($922,400 x 45%) which is closer to the $430,000 they budgeted previously. Annual payments of $100,000 by NYC DEP for operating the advanced treatment processes at the expanded plant and a payment of $20,000 from New York State for treating I-684 wastewater have also been assumed. Thus, the amount of the estimated $1,034,400 O&M cost which must be raised from charges to properties in the sewer district is estimated at $499,400 during the first year of operation.

5.2.4. Financing and Debt Service Costs

In addition to the revenues needed to pay for O&M costs, the sewer district must raise enough money to cover the cost of debt service. As noted in Section 5.2.2 of this report, the total project cost for the proposed sewer system and treatment plant is estimated at $54,264,000. This figure does not take into account the cost of acquiring the DOCS' wastewater facility nor any financial aid that may be available from the NYC DEP, Westchester County, DOCS, or other sources.

Inasmuch as the amount of financial aid available to Bedford and any potential asset purchase price will not be known until negotiations with NYC DEP, DOCS and Westchester County are completed, the local share of total project costs to be financed and the debt service costs that must be met through charges to sewer district property owners cannot be calculated. A maximum amount can be estimated, however, on the assumptions that no aid is received and that the purchase price of the DOCS' wastewater facility is equal to the RCNLD estimate of approximately $11,500,000, as noted in Section 4.2 of this report. Under these assumptions, the entire project and acquisition

cost of approximately $65,764,000 would have to be financed by the sewer district. Estimates of annual charges to property owners within the proposed sewer district have also been made on the basis of different levels of financial assistance and different facility acquisition costs.

5.2.4.1. Scenario 1: Maximum Anticipated Project and Acquisition Costs

Under the assumption that the total estimated project and acquisition cost of $65,764,000 will be financed by the issuance of a 30-year General Obligation (ad valorem serial bond) Bond with an interest rate of 4 percent, an issuance cost of 1.5 percent and equal annual payments, the debt service would be approximately $3,860,000 per year. This amount would have to be raised each year by the property owners within the proposed sewer district through sewer rents or some other form of assessment.

5.2.4.2. Scenario 2: Maximum Costs with Anticipated Grant Funding

It is anticipated that grants totaling at least $20,000,000 will ultimately be obtained to assist in financing the cost of the project. If this amount if obtained, the local share of the project costs would be reduced to $34,264,000. The total project and acquisition cost would be reduced to $45,764,000, and annual debt service would be approximately $2,686,000.

5.2.4.3. Scenario 3: Maximum Project Cost and Mid-Range Acquisition Cost

Under the assumption of a maximum project cost of $54,264,000 and a purchase price of the DOCS' wastewater facility equal to the OCLD estimate of approximately $8,000,000, as noted in Section 4.2 of this report, the total amount to be financed would be approximately $62,264,000 and the annual debt service would be approximately $3,655,000.

5.2.4.4. Scenario 4: Maximum Project Cost with Grant Funding and Mid-Range Acquisition Cost

Under the assumption of the maximum project cost of $54,264,000 will be reduced to $34,264,000 through receipt of $20,000,000 in grant funding, and a purchase price of the DOCS' wastewater facility equal to the OCLD estimate of approximately $8,000,000, the total amount to be financed would be approximately $42,264,000 and the annual debt service would be approximately $2,481,000.

5.2.4.5. Scenario 5: Maximum Project Cost and No Acquisition Cost

Assuming that the Town does not incur any acquisition cost, and a maximum project cost of $54,264,000 will require financing, the annual debt service would be approximately $3,185,000.

5.2.4.6. Scenario 6: Maximum Project Cost with Grant Funding and No Acquisition Cost

Assuming that the Town does not incur any acquisition cost, and the maximum project cost is reduced to $34,264,000 through the receipt of $20,000,000 in grant funding, the annual debt service would be approximately $2,011,000.

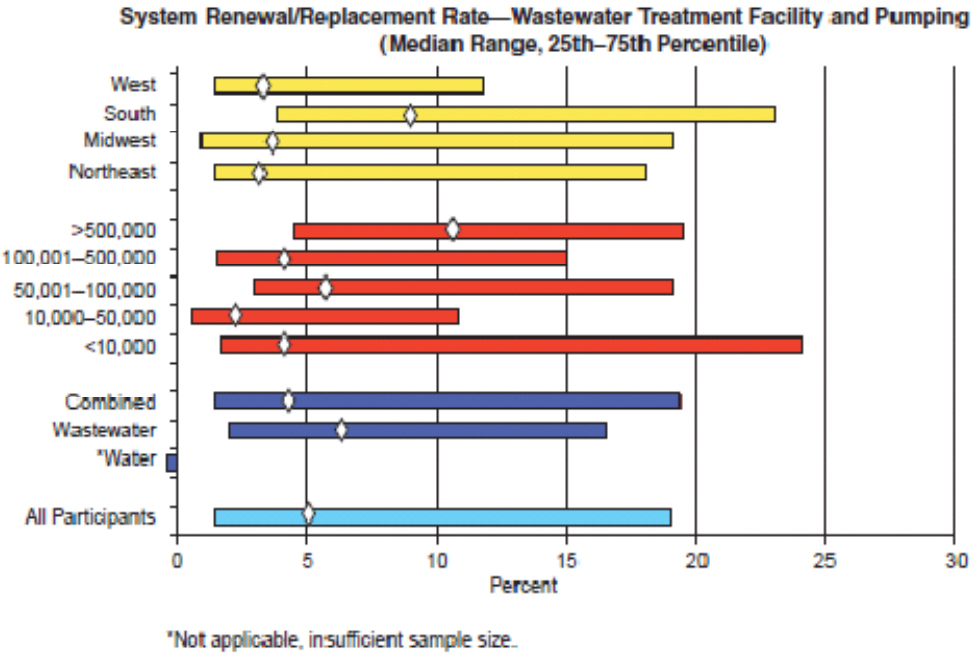
5.2.5. Anticipated Repair and Replacement Needs

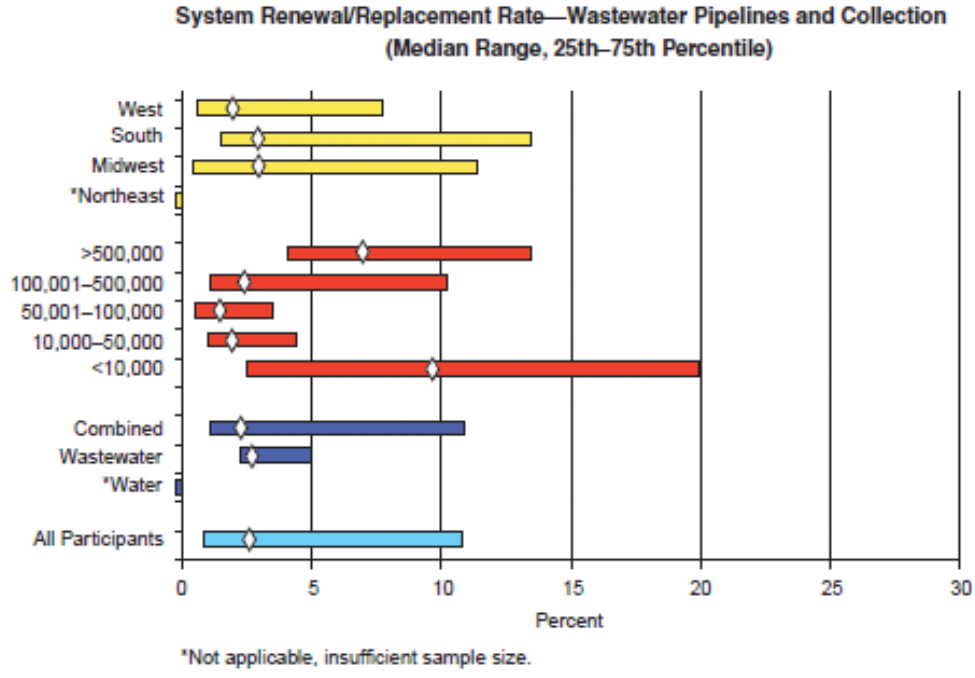
The facility expansion costs described in sections 5.2.1 and 5.2.2 of this report are inclusive of costs associated with the repair and replacement of critical facility equipment deemed in poor condition that is needed to operate the facility under current regulations. However, it is important to note that regulations may change which may result in the need for additional facility upgrades.

Furthermore, the following benchmarks are provided to assist the Town with estimating repair and replacement needs over the twenty year planning period. The 2005 American Water Works Association (AWWA) and Water Environment Federation (WEF) QualServe Benchmarking Program report entitled, "Benchmarking Performance Indicators for Water and Wastewater Utilities: Survey Data and Analyses Report" provides metrics against which water and wastewater facilities can measure performance. As shown in Figure 5-1, the median system renewal and replacement rate for wastewater treatment facilities in the Northeast is approximately two to three percent. The same renewal and replacement rate is shown for wastewater collection systems.

It is recommended that the Town anticipate a capital improvement program comprised of approximately two to three percent of the estimated replacement cost new of DOCS' wastewater system. This level of system renewal and replacement is consistent with the level of system renewal and replacement utilized by other similarly sized wastewater collection systems across the country.

Figure 5-1: System Renewal and Replacement Rate Benchmarks





6. Findings and Recommendations

6.1. Estimated Homeowner Cost for Initial Year of Operation

The proposed sewer district will serve approximately 1520 individual lots, some of which contain two family homes, apartment complexes, schools, commercial establishments and similar facilities which produce more sewage than an average, single family home. To account for this difference in wastewater flows from various categories of sewer users and to achieve a degree of fairness in issuing bills for sewer use, municipal governments have developed the concept of an "equivalent dwelling unit" (EDU). The EDU is based on the average amount of flow produced from a single family home. The minimum of one EDU is usually assigned to any property connected to the sewer system, although in some cases sewer districts have considered a single bedroom apartment unit as equivalent to 0.9 single family homes (or 0.9 EDU) where a number of such units are located at one apartment complex and water use records indicate that the average water use per unit is significantly less than that used by the typical home.

In Bedford Hills and Katonah, water use records indicate that, on average, a single family home uses about 275 gallons of water per day. If 80 to 90 percent of this water is discharged to the sewers, the sewage produced by this average home will range from 220 gallons per day to 247.5 gallons per day. To estimate the number of EDUs in the proposed Bedford sewer district, a figure of 250 gallons per day has been used. Using this figure, it is estimated that approximately 2,000 EDUs will be served by the new sewerage system, excluding the correctional facilities and the I-684 Rest Area, which are outside the proposed district limits and would be served by contract.

In order to estimate the initial year's cost for the sewerage system to a typical, single family home owner, an estimate of the total annual cost must be made. The total annual cost to the sewer district for the initial year of operation, referred to as the "first year total annual cost", is made up of the first year cost for O&M and required debt service payments. Table 6-1 summarizes these costs for six different levels of debt service, based on different assumptions regarding the amount of grant funding received and the amount of any acquisition cost incurred, and also shows the anticipated first year cost to a typical homeowner. Table 6-2 shows the estimated breakdown of O&M costs between the proposed sewer district, DOCS and the NYC DEP. The following six scenarios, as described in Section 5.2.4 of this report, are considered:

- Scenario 1: Maximum Anticipated Project and Acquisition Costs
- Scenario 2: Maximum Costs with Anticipated Grant Funding
- Scenario 3: Maximum Project Cost and Mid-Range Acquisition Cost

- Scenario 4: Maximum Project Cost with Grant Funding and Mid-Range Acquisition Cost
- Scenario 5: Maximum Project Cost and No Acquisition Cost
- Scenario 6: Maximum Project Cost with Grant Funding and No Acquisition Cost

Table 6-1:
Estimated Typical Homeowner Cost for Initial Year of Operation

Description	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Project Cost	$54,264,000	$54,264,000	$54,264,000	$54,264,000	$54,264,000	$54,264,000
Financial Aid	$0	$20,000,000	$0	$20,000,000	$0	$20,000,000
Local Share of Project Cost	$54,264,000	$34,264,000	$54,264,000	$34,264,000	$54,264,000	$34,264,000
Acquisition Cost	$11,500,000	$11,500,000	$8,000,000	$8,000,000	$0	$0
Total Cost to be Financed	$65,764,000	$45,764,000	$62,264,000	$42,264,000	$54,264,000	$34,264,000
Annual Debt Service	$3,860,000	$2,686,000	$3,655,000	$2,481,000	$3,185,000	$2,011,000
Local Share of O&M Cost	$499,400	$499,400	$499,400	$499,400	$499,400	$499,400
Total First Year O&M and Debt Service Cost	$4,359,400	$3,185,400	$4,154,400	$2,980,400	$3,684,400	$2,510,400
Estimated EDUs	2,000	2,000	2,000	2,000	2,000	2,000
First Year Cost per EDU	**$2,180**	**$1,593**	**$2,077**	**$1,490**	**$1,842**	**$1,255**

Table 6-2:
O&M Breakdown

Description	Total
First Year O&M Cost	$1,034,400
O&M Cost Paid by DOCS and NYS	-$435,000
O&M Cost Paid by NYC DEP	-$100,000
O&M Cost to be Raised from District Property Owners (Local Share of O&M Cost)	$499,400

6.2. Additional Considerations

There are additional factors relative to procuring the DOCS' wastewater assets that the Town may consider. The advantages of procuring the DOCS' wastewater assets include enhanced environmental stewardship, control of wastewater treatment costs and the ability to adapt for potential future growth. The disadvantages include the increased administrative burden associated with providing wastewater services and various risks associated with facility ownership. These factors are described in more detail below.

+ *Control of Operations*. The Town would control the operation, maintenance, and capital decisions that will impact the cost of its wastewater treatment. In addition the Town will control the timing and cost of future plant expansions that may be needed to handle increased flows associated with potential future growth within the Town's service area.

+ *Enhanced Environmental Stewardship.* The Town could address water quality issues for Bedford residents (i.e., no longer risk environmental degradation due to failing septic systems), promoting better overall environmental stewardship.

– *Administrative Burden.* The Town would be responsible for billing and other administrative issues related to the wastewater system, and may need to hire additional staff to fulfill these new responsibilities.

– *Ownership Risk*. The Town would accept ownership risk associated with regulatory compliance and protection of human health and the environment. For example, the Town may face some risk and liability associated with the discharge of the wastewater treatment plant not meeting discharge requirements due to equipment failure or other factors. The Town would also need to accept the potential future liability associated with repair and replacement of existing infrastructure. In addition, the Town would bear some risk and carrying cost of excess capacity if the plant was not utilized to its full capacity. If the Town were not able to divert enough flow to the expanded facility to utilize its full 1 mgd of capacity, fixed capital and operating expenses would be spread over a smaller volume of wastewater, thereby increasing the unit cost of wastewater treatment.

6.3. Next Steps

Should the Town decide to move forward with a negotiated sale, franchise, long term lease or other structure to transfer the responsibility of these assets, it is recommended that the Town obtain legal assistance regarding the applicability of state and local laws and regulations governing the transfer of the assets to the Town. It is also recommended that a full due diligence of the wastewater assets is conducted.

Once negotiations with the DOCS, the NYS DEP and Westchester County are complete, should the asset acquisition take place, the Town will need to implement policies, procedures and ordinances relative to the management of the wastewater treatment assets. In alignment with the industry's best management practices, it is recommended that the Town consider the development of an asset management plan to support ongoing maintenance activities as well as future repair and rehabilitation needs. Furthermore, the development of a long term financial plan, including a wastewater rate and charge study, will help to ensure the financial sustainability of the wastewater treatment assets.

Town of Bedford

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Appendix A

Asset Inventory

MALCOLM PIRNIE

Inventory of DOCS' Wastewater Facility Assets

I. EQUIPMENT

Preliminary Treatment
- Equalization Basin Blowers No. 1
- Equalization Basin Blowers No. 2
- Equalization Basin No. 1 Coarse Bubble Diffusers
- Equalization Basin No. 2 Coarse Bubble Diffusers
- Grit Classifier
- Grit Pump
- Influent Grinder
- Influent Pump No. 1
- Influent Pump No. 2
- Influent Pump No. 3
- Parshall Flumes
- Rotary Fine Screen Bedford
- Rotary Fine Screen Taconic
- Static Screen No. 1
- Static Screen No. 2
- Vortext Grit System and Grit Classifier

Primary Treatment
- Primary Clarifier No. 1 Flight and Drive
- Primary Clarifier No. 2 Flight and Drive

Secondary Treatment
- Secondary Clarifier No. 1 Flight and Drive
- Secondary Clarifier No. 2 Flight and Drive
- Trickling Filter Feed Pump No. 1
- Trickling Filter Feed Pump No. 2
- Trickling Filter No. 1
- Trickling Filter No. 1 Blower
- Trickling Filter No. 1 Distributer Arms
- Trickling Filter No. 2
- Trickling Filter No. 2 Blower
- Trickling Filter No. 2 Distributer Arms
- Trickling Filter Recycle Pump No. 1
- Trickling Filter Recycle Pump No. 2
- Trickling Filter Recycle Pump No. 3

Tertiary Treatment and Disinfection
- Alum Addition
- Dechlorination System
- Filter Air Compressor
- Filter Backwash Blowers
- Filter Backwash Blowers
- Filter Backwash Pump No. 1
- Filter Backwash Pump No. 2
- Membrane Feed Pump No. 1
- Membrane Feed Pump No. 2

(EQUIPMENT continued)

Tertiary Treatment and Disinfection (con't)
- Membrane Filtration Pump No. 1
- Membrane Filtration Pump No. 2
- Membrane Filtration Pump No. 3
- Membrane Microlftration System
- Mudwell Pump No. 1
- Mudwell Pump No. 2
- Polymer Addition
- RSF System
- Soda Ash (Caustic) Addition
- Standby Chlorine System
- Turbidimeters
- Ultraviolet Chamber No. 1
- Ultraviolet Chamber No. 2
- Ultraviolet Chamber No. 3
- Ultraviolet Recirculation Pump No. 1
- Ultraviolet Recirculation Pump No. 2
- Ultraviolet Transmitter

Solids Handling
- Belt Filter Press
- Digester No. 1 Mixer
- Digester No. 2
- Sludge Pump No. 1
- Sludge Pump No. 2
- Sludge Pump No. 3

Other Equipment
- Dial Out Panel
- Domestic Water Pump No. 1
- Domestic Water Pump No. 2
- Emergency Generator No. 2 (Micro-Filtration Bldg)
- Emergency Generator No.1 (Main Plant)
- Fire Panel
- Magnetic Flow Meter No. 1
- Magnetic Flow Meter No. 2
- SCADA
- Storage Tank (Fuel Oil) No. 1
- Storage Tank (Fuel Oil) No. 2

II. BUILDINGS

Preliminary Treatment
- Bedford Hills Screen Building
- Blower Building
- Grit / Headworks Building

(BUILDINGS continued)

Preliminary Treatment (con't)
- Screenings Building
- Taconic Screen Building

Primary Treatment
- *None*

Secondary Treatment
- *None*

Tertiary Treatment and Disinfection
- Dechlorination Station
- Microfiltration Building
- Rapid Sand Filter Building
- Standby Chlorine Building

Solids Handling
- Belt Filter Press Building
- Control Building

Other Buildings
- Maintenance Garage

III. CONCRETE TANKS

Preliminary Treatment
- Equalization tank #1
- Equalization tank #2
- Equalization wet well
- Grit chamber
- Influent parshall flumes
- Meter pit
- Valve pit

Primary Treatment
- Primary clarifier #1
- Primary clarifier #2

Secondary Treatment
- Secondary clarifier #1
- Secondary clarifier #2
- Trickling filter #1
- Trickling filter #2

Tertiary Treatment and Disinfection
- Cascade
- Chlorine contact tank
- Rapid sand filtration

Solids Handling
- Digester 1
- Digester 2

Other Concrete Tanks
- Misc. concrete pads

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Appendix B

Summary of Equipment Condition Assessment Comments

MALCOLM PIRNIE

Equipment Condition Assessment Summary for Bedford Hills Correctional Facility Wastewater Treatment Plant		
Equipment Description	**Condition Comments**	**Condition Rating**
Alum Addition	Chemical feed system is in generally good condtion. Buried chemical feed lines not assessed.	2
Alum Addition	Chemical feed system is in generally good condtion. Buried chemical feed lines not assessed.	2
Belt Filter Press	Not in use. May be in good condition if operable. Polymer system in poor condition.	2
Dechlorination System	Gas dechlorination system was left in place during the 2002 upgrade as a back up to the UV system. Not in use.	4
Dial Out Panel	Instrumentation and field devices appear to be in generally very good conditon.	1
Digester No. 1 Mixer	South tank - Used for sludge storage. Mixer observed operating.	2
Digester No. 2	North Tank - Used for sludge storage if the south tank is at capacity.	3
Domestic Water Pump No. 1	Plant water system is not inoperation due to compliance change during the 2002 upgrade.	5
Domestic Water Pump No. 2	Plant water system is not inoperation due to compliance change during the 2002 upgrade.	5
Emergency Generator No. 2 (Microfiltration Bldg)	Emergency generator is in good condition, the plant has an excellent PMP for emergency generators.	2
Emergency Generator No.1 (Main Plant)	Emergency generator is in good condition, the plant has an excellent PMP for emergency generators.	2
Equalization Basin Blowers No. 1	Generally in good condition.	2
Equalization Basin Blowers No. 2	Generally in good condition, motor recently replaced.	2
Equalization Basin No. 1 Coarse Bubble Diffusers	Coarse bubble aeration system was installed in 2002 and is very good condition.	1
Equalization Basin No. 2 Coarse Bubble Diffusers	Approximately 50 percent of coarse bubble diffusers have air distribution.	4
Filter Air Compressor	Rapid Sand filters were install in 1992 and mechanical components appear to be in generally good condition.	2
Filter Backwash Blowers	Rapid Sand filters were install in 1992 and mechanical components appear to be in generally good condition.	2
Filter Backwash Blowers	Rapid Sand filters were install in 1992 and mechanical components appear to be in generally good condition.	2
Filter Backwash Pump No. 1	Rapid Sand filters were install in 1992 and mechanical components appear to be in generally good condition.	2
Filter Backwash Pump No. 2	Rapid Sand filters were install in 1992 and mechanical components appear to be in generally good condition.	2
Fire Panel	Instrumentation and field devices appear to be in generally very good conditon.	1
Grit Classifier	Vortex grit removal system was installed in 2002 and is in generally good condition.	2
Grit Pump	Vortex grit removal system was installed in 2002 and is in generally good condition.	2
Influent Grinder	Vortex grit removal system was installed in 2002 and is in generally good condition.	2
Influent Pump No. 1	Pumps are less than 10 years old and are in generally condition.	2
Influent Pump No. 2	Pumps are less than 10 years old and are in generally condition.	2
Influent Pump No. 3	Pump is less than 10 years old, however, motor was out of service at the date of the inspection.	2
Magnetic Flow Meter No. 1	Instrumentation and field devices appear to be in generally very good conditon.	1
Magnetic Flow Meter No. 2	Instrumentation and field devices appear to be in generally very good conditon.	1

Equipment Description	Condition Comments	Condition Rating
Membrane Feed Pump No. 1	Membrane microfiltration system was installed in 2002 and is good condition.	2
Membrane Feed Pump No. 2	Membrane microfiltration system was installed in 2002 and is good condition.	2
Membrane Filtration Pump No. 1	Membrane microfiltration system was installed in 2002 and is good condition.	2
Membrane Filtration Pump No. 2	Membrane microfiltration system was installed in 2002 and is good condition.	2
Membrane Filtration Pump No. 3	Membrane microfiltration system was installed in 2002 and is good condition.	2
Membrane Microlftration System	Membrane microfiltration system was installed in 2002 and is good condition.	2
Mudwell Pump No. 1	Rapid Sand filters were install in 1992 and mechanical components appear to be in generally good condition.	2
Mudwell Pump No. 2	Rapid Sand filters were install in 1992 and mechanical components appear to be in generally good condition.	2
Parshall Flumes	Parshall flumes are inoperable due to a construction error in hydrualics.	5
Polymer Addition	Polymer addition is not utilized anymore due to membrane microfiltration perofrmance for solids removal.	5
Primary Clarifier No. 1 Flight and Drive	Primary clarifiers are in generally good condition, except the rotary scum skimmer needs to be replaced.	2
Primary Clarifier No. 2 Flight and Drive	Primary clarifiers are in generally good condition, except the rotary scum skimmer needs to be replaced.	2
Rotary Fine Screen Bedford	Fine screening facilities were installed in 2004 and are in very good condition.	1
Rotary Fine Screen Taconic	Fine screening facilities were installed in 2004 and are in very good condition.	1
RSF System	Underdrain and filter bottom in cell no 1 recently failed and need to be replaced.	4
SCADA	Instrumentation and field devices appear to be in generally very good conditon.	1
Secondary Clarifier No. 1 Flight and Drive	Secondary clarifier no. 1 is in geenrally good condition from visual observation of the chain and drive.	2
Secondary Clarifier No. 2 Flight and Drive	Secondary clarifier no. 2 drive and chain need to be replaced and are currently not in operation.	4
Sludge Pump No. 1	Sludge Pump No. 1 uses scavaged parts from Pump Nos. 2 and 3.	5
Sludge Pump No. 2	Sludge pump No. 2 is inoperable due to parts missing and being utilized for Pump No. 1.	5
Sludge Pump No. 3	Sludge pump No. 3 is inoperable due to parts missing and being utilized for Pump No. 1.	5
Soda Ash (Caustic) Addition	pH adjustment has not been utilized with alum addition due to alkalinity of the wastewater.	4
Standby Chlorine System	Gas chlorinators were left in place during the 2002 upgrade as a backup to the UV system. Not currently in use.	5
Static Screen No. 1	Screens are currently removed as remote rotary fine screens were installed in 2004.	4
Static Screen No. 2	Screens are currently removed as remote rotary fine screens were installed in 2004.	4
Storage Tank (Fuel Oil) No. 1	Below ground - not viewed.	Not Rated
Storage Tank (Fuel Oil) No. 2	Fuel oil tank visually appeared in generally good condition, however, tanks should be tested independently.	Not Rated

Equipment Description	Condition Comments	Condition Rating
Trickling Filter Feed Pump No. 1	Generally in good condition, some corrosion and significant usage.	3
Trickling Filter Feed Pump No. 2	Generally in good condition, some corrosion and significant usage.	3
Trickling Filter No. 1	Original, retrofitter in 1991 (steel tank added on top of the concrete tank).	3
Trickling Filter No. 1 Blower	Trickling filter blowers are out of service. Air flow through the trickling filter is currently sufficent with blowers.	5
Trickling Filter No. 1 Distributer Arms	Clogged. Not rotating or spraying well.	4
Trickling Filter No. 2	1991 Steel tank built with some concrete at base.	2
Trickling Filter No. 2 Blower	Trickling filter blowers are out of service. Air flow through the trickling filter is currently sufficent with blowers.	5
Trickling Filter No. 2 Distributer Arms	Trickling filter arms are generally in good condition.	3
Trickling Filter Recycle Pump No. 1	Generally in good condition, some corrosion and significant usage.	3
Trickling Filter Recycle Pump No. 2	Generally in good condition, some corrosion and significant usage.	3
Trickling Filter Recycle Pump No. 3	Only two trickling filter recycle pumps are currently in operation. There is not a 3rd pump.	Not Rated
Turbidimeters	Membrane microfiltration system was installed in 2002 and is good condition.	1
Ultraviolet Chamber No. 1	UV system was installed in 2002 and is generally in good conditon.	2
Ultraviolet Chamber No. 2	UV system was installed in 2002 and is generally in good conditon.	2
Ultraviolet Chamber No. 3	UV system was installed in 2002 and is generally in good conditon.	2
Ultraviolet Recirculation Pump No. 1	UV system was installed in 2002 and is generally in good conditon.	2
Ultraviolet Recirculation Pump No. 2	UV system was installed in 2002 and is generally in good conditon.	2
Ultraviolet Transmitter	UV system was installed in 2002 and is generally in good conditon.	1
Vortext Grit System and Grit Classifier	Vortex grit removal system was installed in 2002 and is in generally good condition.	2

Town of Bedford

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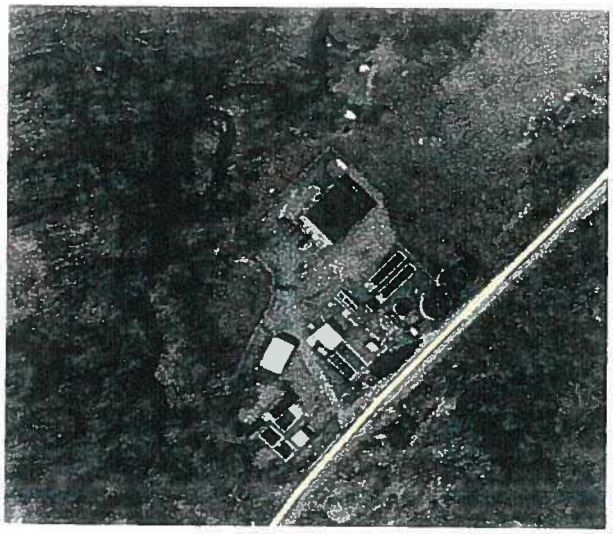
Appendix C

Rand Commercial Services Land Valuation Report (2010)

MALCOLM PIRNIE

RAND
COMMERCIAL
SERVICES

Valuation Analysis of Land Associated with Bedford Hills Wastewater Treatment Plant



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Submitted to:

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1200 MacArthur Blvd.
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6. Value

1. Summary of Findings

At the request of Joseph Cleary and Gary Grey of Hydro Qual, Inc, Rand Commercial Services studied the current market value of the land associated with the Wastewater Treatment Plant on the grounds of the Bedford Womens Correctional Facility. On Friday, January 15, 2010, Scott Baird, a NYS Licensed Real Estate Salesperson and commercial specialist, visited the site and walked the premises with Gary Grey of HydroQual, Inc.

Based upon that visual inspection, a review of the neighboring properties, a review of recent property sales and listings in the Town of Bedford, and a general knowledge of the real estate market in the northern Westchester region, we offer the following estimation of property value.

The current market value of the land, without any improvements, as of the date of this report, can be estimated as

$1,200,000 (One million, two hundred thousand dollars)

This is not an appraisal, but, rather, an estimation of market value based on our professional judgement. The detailed rationale for this estimation is included in the attached report.

2. Methodology and Scope of Assignment

Rand Commercial Services was requested to evaluate the current market value of the land associated with the Bedford Correctional Facility Wastewater Treatment Plant. None of the existing structures or improvements were to be considered when making this evaluation. The value of the structure, roads, fences, and process equipment are outside the scope of this evaluation.

As there are no comparable sales or listings of land for the construction of a wastewater treatment plant, land sales and listings for development were used as comparative measures. These comparative sales and listings were evaluated on the basis of the following criteria:

1. Size of total land sale
2. Status of municipal approvals for development
3. Comparative desirability of location

It should be noted, however, that as there is an existing wastewater treatment plant on the site and the property is adjacent to a correctional facility, it is likely that there are few potential buyers for the subject property. The potential use is limited to the existing use or other similar auxiliary functions of the correctional facility. On the other hand, the purpose served by a municipal wastewater treatment facility that is permitted to operate in the New York City watershed area, makes this property extremely valuable to the few candidates who would consider purchasing the property.

3. *Description of Property*

Physical characteristics

The subject property consists of 7-10 acres of land lying on the intersection of Harris Road and Beaver Dam Road in the Town of Bedford, Westchester County, New York. The land slopes down from Beaver Dam Road to the Broad Creek. There are two paved entrances and several existing buildings and structures. Across Beaver Dam Road to the east the property rises quickly. The property is not heavily vegetated- having mostly small scrub brush or landscaped surfaces. In the area directly adjacent to the Broad Creek, there appear to be wet, marshy areas- it is unknown if these are Federally or State designated wetlands.

Location

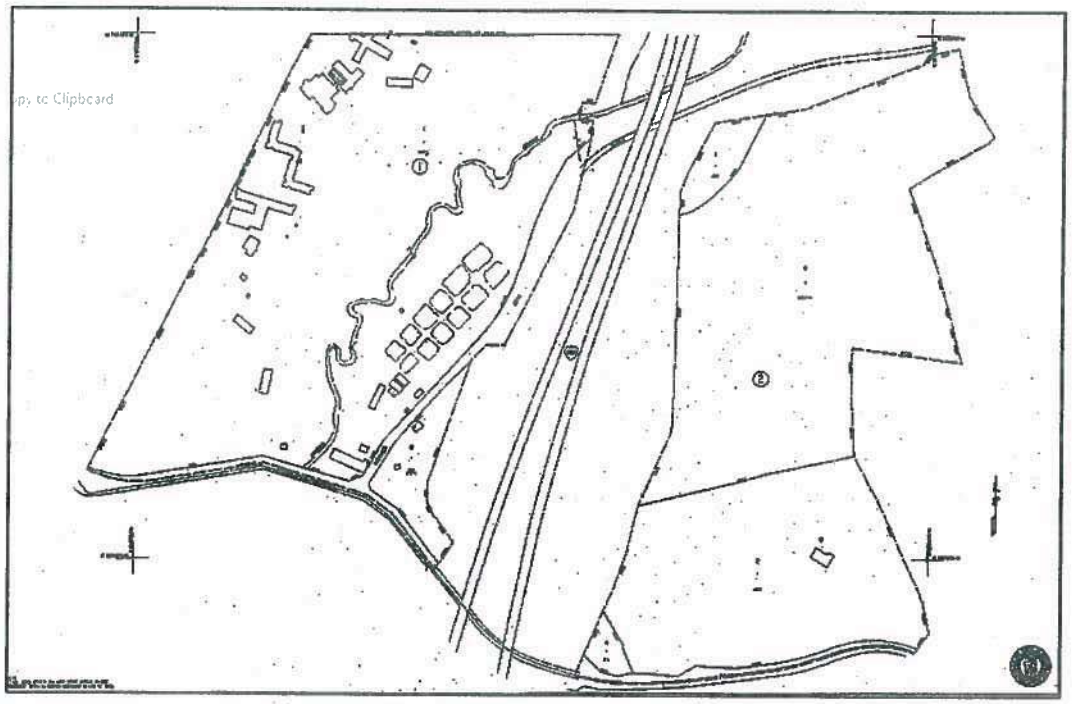
The subject property is located within 5 minutes of the Saw Mill River Parkway. It also located just outside the hamlet of Bedford Hills. The subject is also nearby Highway 684- however, the only close vehicular access is via the Saw Mill River Parkway.

Zoning and Comprehensive Plan

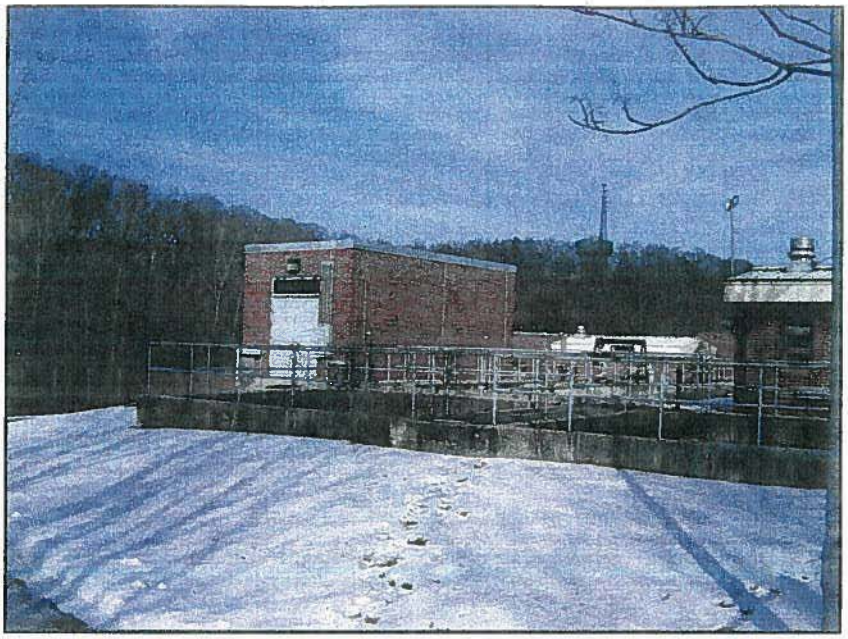
The subject property is adjacent to existing Medium Density (R1/4 or R1/2) zoning associated with the Hamlet of Bedford Hills

Aerial View

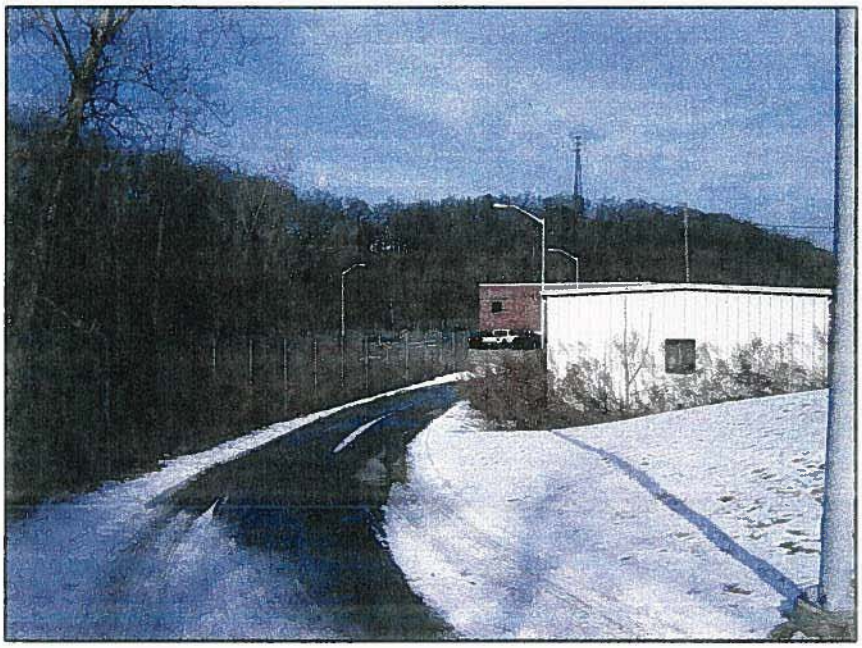
Tax Map



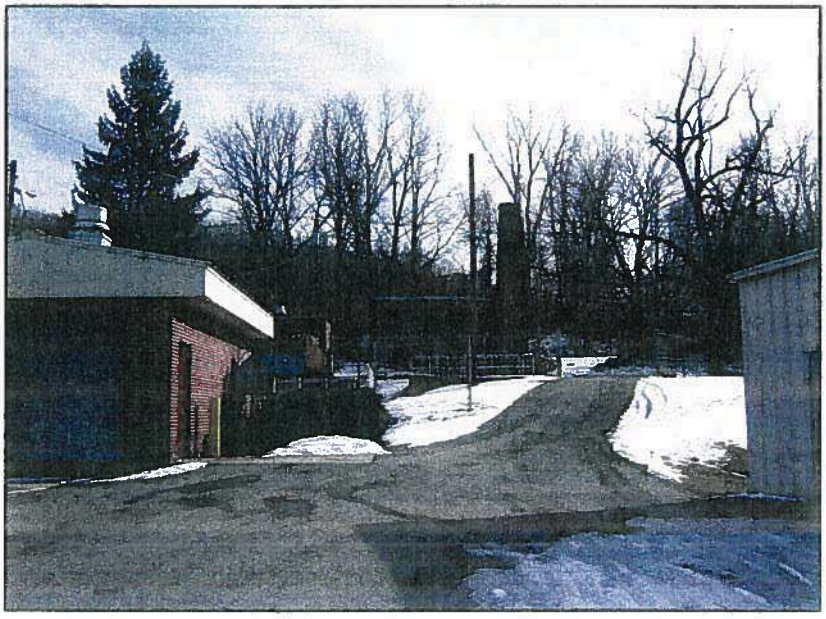
Photos



View of property facing North



Access road from Beaver Dam Road and WWTP structures



View west towards Broad Creek

View north

View from Bever Dam Road

View of Broad Creek and surroundin marshes

Broad Creek

4. *Comparative Listings for sale*

The following listings were considered as comparative listings for the purpose of evaluating the value of the Bedford WWTP land.

Bedford WWTP Valuation Analysis

Comparable Listings Currently on the Market

	MLS #	Address	Location	Asking Price	Acres	Listing Date	Days on Market	Asking price/Acre
1	2730819	20 Stone Paddock PL	Bedford	$ 1,250,000	4	10/4/2007	837	$ 312,500
2	2919213	84 Twin Lakes Dr	Bedford	$ 1,495,000	4.75	6/15/2009	226	$ 314,737
3	2913098	Salem Rd	Bedford	$ 1,495,000	14.436	4/28/2009	273	$ 103,561
4	2730212	322 Succabone Rd	Bedford	$ 1,575,000	5.3	9/28/2007	843	$ 297,170
5	2917837	Penwood Rd	Bedford	$ 1,600,000	6.22	6/4/2009	237	$ 257,235
6	2919221	90 Twin Lakes Dr	Bedford	$ 1,695,000	5.34	6/15/2009	226	$ 317,416
7	2819526	7 Pine Ridge Rd	Bedford	$ 1,850,000	12.15	6/13/2008	588	$ 152,263
8	2836728	488 ABC Long Ridge Rd	Bedford	$ 2,999,000	9	12/8/2008	413	$ 333,222

The following factors must be considered when reviewing the value of each parcel:

Comp 1: This is a single building lot because it is located in a 4 acre zone- this decreases the per acre value. The property has been over two years on the market which indicates it is overpriced. The property is in a more rural area, which would increase value in Bedford.

Comp 2: This is a single building lot because it is located in a 4 acre zone- this decreases the per acre value. The property has been over two years on the market which indicates it is overpriced. The property is in a more rural area, which would increase value in Bedford.

Comp 3: This is a single building lot and it has a pond on the site- this decreases the per acre value. The property has been over one year on the market which indicates it may be overpriced. The property is in a more rural area, which would increase value in Bedford.

Comp 4: This is a single building lot because it is located in a 4 acre zone- this decreases the per acre value. The property has been over two years on the market which indicates it is overpriced. The property is in a more rural area, which would increase value in Bedford. The property has permit and site plan approvals which increases value

Comp 5: This is a single building lot located in a gated community. This increases value.

Comp 6: This is a single building lot that has a pond on the site- this decreases the per acre value. The property has been over one year on the market which indicates it may be overpriced. The property is in a more rural area, which would increase value in Bedford.

Comp 7: This is a subdividable parcel with a possible 4 or 5 building lots It has a pond which decreases per acre value. There are not approvals which is similar to the subject property. The property has been listed for over a year which indicates that it may be over priced.

Comp 8: This property contains 3 fully approved building lots adjacent to a conservation easement. This increases value.

Based on these comparative listings, the value of the subject property is $250,000/acre.

On the following pages, we have included a map of these listings and the MLS summaries of the listings.

5. *Comparative Listings sold*

The following listings were considered as comparative listings for the purpose of evaluating the value of the Bedford WWTP land.

Bedford WWTP Valuation Analysis

Comparable Listings Sold

	MLS #	Address	Location	Asking Price	Sale Price	Acres	Sale Date	Days on Market	Sale price/Acre
1	2908143	17 Whitlockville Rd	Katonah	$ 340,000	$ 250,000	2.054	6/12/2009	86	$ 121,714
2	2907771	7 Old Katonah Dr	Katonah	$ 375,000	$ 337,500	1	11/24/2009	254	$ 337,500
3	2925387	46 N. Greewich Rd	Armonk	$ 389,000	$ 365,000	3.58	11/24/2009	98	$ 101,955
4	2836580	36 Barrett Rd	Katonah	$ 500,000	$ 398,000	1.3	7/23/2009	233	$ 306,154
5	2901605	Ferdinand Dr	Katonah	$ 550,000	$ 400,000	2.79	10/1/2009	258	$ 143,369
6	2814395	45 Hammond Ridge Rd	Bedford Corners	$ 525,000	$ 425,000	1.96	5/1/2009	364	$ 216,837
7	2735786	24 Nichols Rd	Armonk	$ 549,999	$ 500,000	1.3	5/13/2009	528	$ 384,615
							AVG:		$ 230,306

The following factors should be considered when comparing the value of each sold listing to the subject property:

Comp 1: The property is a single building lot. The property is in Katonah which would decrease relative value. Property had no building approvals

Comp 2: The property is a single building lot. The property is in Katonah which would decrease relative value. Property had building approvals which increases value.

Comp 3: This property was bank owned and sold as-is, which tends to reduce value. There are no approvals and a pond on a portion of the acreage.

Comp 4: Property includes a pool, pool house and garage which increases value.

Comp 5: Single building lot in a subdivision in Katonah. This decreases relative value.

Comp 6: Approved home site in Bedford. Increased value due to approvals. Long time on market indicates reduced demand.

Comp 7: Unapproved home site. Extremely long time on market indicates possibly over priced.

Based on these comparative sales, the value of the subject property could be estimated as $220,000 per acre.

On the following pages, we have included a map of these listings and the MLS summaries of the listings.

6. *Value*

Based on a review of comparable sales and listings in the Town of Bedford during the year 2009, the value of the subject property is approximately $230,000 per acre.

However, the subject property is not in a prime development location. The property is adjacent to an overpass for Route 684- which is heavily trafficked and would likely be a source of significant noise. Additionally, the land is on the grounds of Bedford Hills Correctional- a maximum security women's prison operated by the State of New York. Although the land is discreet from the prison- this location would negatively affect the overall value. Since similar sales of property on the grounds of an active correctional facility are unavailable, we propose a discount factor of 25% be applied to the per acre values. This is in recognition of the difficulties inherent in developing on the subject property. This would bring the value of the subject property to $172,500 per acre.

Therefore considering a total lot size of 7 acres, the total value of the property is $1,200,000 (One million, two hundred thousand dollars).

Town of Bedford
321 Bedford Road • Bedford Hills, NY 10507

Appendix D

Scoring and Ranking Guidelines by Asset Class

MALCOLM PIRNIE

Physical Condition Criteria and Ranking Guidelines (Mechanical Summary)

Criteria	Condition	1	2	3	4	5
Corrosion	Surface only	0%	<10%	10%-50%	>50% - 75%	>75%
	Structural	None	None	None	1 location	>1 location
Leakage	Gaskets / Connections	None	Historic only	Drip only	Stream 1 loc	Stream >1 loc
	Holes / Failures	None	None	None	1 location	>1 location
Vibration	Apparent with Noise	None	None	Yes	Yes	Yes
	Non-Structural Damage	None	None	None	Yes	Yes
	Structural Damage	None	None	None	None	Yes
Concrete Pedestals	Surface Cracking / Loose Grout	None	<10%	10%-50%	>50% -75%	>75%
	Through Cracks	None	None	None	<25%	>=25%
	Missing Pieces	None	None	None	None	1 or more
Steel Supports	Surface Corrosion	None	<10%	10%-50%	50%-75%	>75%
	Structural Corrosion	None	None	None	<25%	>=25%
	Missing/Broken Anchors	None	None	None	<25%	>=25%
Apparent Maintenance Needs	Routine PM only	None	None	Yes	Yes	Yes
	Corrective Action	None	None	None	Yes	Yes
	Major rehab or replacement	None	None	None	None	Yes
Piping / Valves	Leaks – gaskets	None	None	Drips only	Stream – 1 loc	Stream - >1 loc
	Leaks – holes / failures	None	None	None	1 location	>1 location
	Corrosion - surface	None	<10%	10%-50%	>50%-75%	>75%
	Corrosion - structural	None	None	None	<20%	>=20%
	Support Damage	None	None	None	<20%	>=20%
Local Panels	Surface corrosion	None	<10%	10%-50%	>50%-75%	>75%
	Structural damage	None	None	None	1 location	>1 location
	Internal corrosion / leakage	None	None	None	Yes	Yes
	Panel Instruments – non-function	None	None	None	<20%	>=20%
Field Instruments	Damage / non-functional devices	None	None	None	<20%	>=20%
	Leakage	None	None	Drips only	Stream – 1 loc	Stream - >1 loc
Electrical Connections	Conduit / J. Box Surface Corrosion	None	None	<20%	>20%-50%	>50%
	Damage / gaps / missing gaskets	None	None	None	1 location	>1 location
	Exposed wiring	None	None	None	1 location	>1 location

Physical Condition Criteria and Ranking Guidelines (Structural Summary)

Criteria	Condition	1	2	3	4	5
Corrosion	Surface only	0%	<10%	10%-50%	>50% - 75%	>75%
Leakage	Cracks/Joints	None	Historic only	Drip only	Stream 1 loc	Stream >1 loc
	Penetrations / Failures	None	None	None	1 location	>1 location
Concrete/Masonry Surface Damage	Cracking (Width of crack)	None	Minor (< 1mm)	Moderate (1-2mm)	Major (>2mm)	Excessive (not serviceable)
	Exposed Reinforcement	None	None	None	1 location	>1 location
	Spalling, Exposed Aggreg., Pitting, Delamination, Freeze/Thaw Damage	0%	0%	<10%	>10% - 30%	>30%
Joint Damage	Deterioration	0%	<10%	10%-50%	>50% - 75%	>75%
Settling	Magnitude	None	Minor	Moderate	Major	Excessive
Steel Damage	Cracking	None	None	None	1 location	>1 location
	Fatigue/Connection Failure	None	None	None	1 location	>1 location
	Deformation	None	Minor	Moderate	Major	Excessive
	Loss of Section	0%	0%	<10%	>10% - 30%	>30%
Wood Damage	Dry Rot	None	None	None	1 location	>1 location
	Warping/Splitting	None	None	None	1 location	>1 location
	Connection Failure	None	None	None	1 location	>1 location
	Loss of Section	0%	0%	<10%	>10% - 30%	>30%
Apparent Maintenance Needs	Routine PM only	None	None	Yes	Yes	Yes
	Corrective Action	None	None	None	Yes	Yes
	Major rehab or replacement	None	None	None	None	Yes
Roof	Leaks - Cracks/Joints	None	Historic only	Drip only	Stream 1 loc	Stream >1 loc
	Leaks - Penetrations / Failures	None	None	None	1 location	>1 location
	Sagging	None	Minor	Moderate	Major	Excessive
	Support Damage	None	None	None	<20%	>=20%
Railings	Surface corrosion	None	<10%	10%-50%	>50%-75%	>75%
	Structural corrosion	None	None	None	1 location	>1 location
	Missing Pieces	None	None	None	None	1 or more
Walkways Platforms Stair Ladders	Surface corrosion	None	<10%	10%-50%	>50%-75%	>75%
	Loss of Section	0%	0%	<10%	>10% - 30%	>30%
	Cracking	None	None	None	1 location	>1 location
	Fatigue/Connection Failure	None	None	None	1 location	>1 location
	Deformation	None	Minor	Moderate	Major	Excessive
Doors/Hatches	Leaks - Cracks/Joints	None	Historic only	Drip only	Stream 1 loc	Stream >1 loc
	Leaks - Penetrations / Failures	None	None	None	1 location	>1 location
	Missing/Broken Hinges	None	None	None	None	1 or more

Physical Condition Criteria and Ranking Guidelines (Electrical Summary)

Criteria	Condition	1	2	3	4	5
Corrosion	Surface only	None	None	<20%	>20%-50%	>50%
	Structural	None	None	None	1 location	>1 location
Dielectric Leakage	Transformer/Connection Leaks	None	Historic only	Drip only	Stream 1 loc	Stream >1 loc
	Holes / Failures	None	None	None	None	1 location
Vibration	Apparent with Noise	None	None	Yes	Yes	Yes
	Non-Structural Damage	None	None	None	Yes	Yes
	Structural Damage	None	None	None	None	Yes
Electrical Damage	Evidence of Overheating/Arcing	None	None	None	1 location	>1 location
	Evidence of Water Damage	None	None	None	1 location	>1 location
	Grounding Missing/Damaged	None	None	None	1 location	>1 location
	Insulation Wear	None	None	None	1 location	>1 location
	Cooling System Broken	None	None	None	1 location	>1 location
Concrete Pedestals	Surface Cracking / Loose Grout	None	<10%	10%-50%	>50% -75%	>75%
	Through Cracks	None	None	None	<25%	>=25%
	Missing Pieces	None	None	None	None	1 or more
Steel Supports	Surface Corrosion	None	<10%	10%-50%	50%-75%	>75%
	Structural Corrosion	None	None	None	<25%	>=25%
	Missing/Broken Supports	None	None	None	<25%	>=25%
Apparent Maintenance Needs	Routine PM only	None	None	Yes	Yes	Yes
	Corrective Action	None	None	None	Yes	Yes
	Major rehab or replacement	None	None	None	None	Yes
Motor Control Centers/Panels	Breakers Tripped	None	None	1 location	2 locations	>2 locations
	Drawings and Labeling Missing	No	No	No	Yes - One	Yes - Both
Conduit or Junction Box	Corrosion - surface	None	<10%	10%-50%	>50%-75%	>75%
	Corrosion - structural	None	None	None	<20%	>=20%
	Support Damage	None	None	None	<20%	>=20%
	Exposed Wiring	None	None	None	1 location	>1 location
	Damage / gaps / missing gaskets	None	None	None	1 location	>1 location
	Connections Loose/Broken	None	None	None	1 location	>1 location
Door Mounted Inst.	Damage / non-functional devices	None	None	None	<20%	>=20%

Asset Performance Condition Criteria, Weighting and Ranking Guidelines

Criteria	Assessment Level	Weight	Condition	1	2	3	4	5
Capacity	Process / System	31%	Ability to meet current capacity	Avg. – Yes* Peak – Yes*	Avg. – Yes* Peak – Yes**	Avg. – Yes* Peak – No**	Avg. – Yes** Peak – No**	Avg. – No** Peak – No**
			Ability to meet future capacity	Avg. – Yes Peak - Yes	Avg. – Yes Peak - No	Avg. – Yes Peak - No	Avg. – No Peak - No	Avg. – No Peak - No
Regulatory	Process / System	5%	Ability to meet current regulations	Yes	Yes	Yes	Yes – with some modification required	No
			Ability to meet future regulations	Yes	Yes – with some modifications required	No	No	No
Reliability	Equipment Group	30%	Average time equipment is available	99-100% (4 days OS)	95-99% (18 days OS)	90-94% (36 days OS)	85-89% (55 days OS)	< 84% (>55 days OS)
O&M Issues	Equipment Group	21%	Frequency of O&M Issues (Excluding Breakdowns)	None	Very Infrequently (Quarterly)	Infrequently (Monthly)	Frequently (Weekly)	Very Frequently (Daily)
Obsolescence	Equipment Group	13%	Equipment Technology	State of the Art / Best Available	Industry standard / “Tried and True”	Technology considered appropriate	Technology nearing obsolescence/ Misapplied	Technology obsolete / out of date

Town of Bedford

321 Bedford Road • Bedford Hills, NY 10507

Appendix E

Individual Asset Condition Assessment Sheets

MALCOLM PIRNIE

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Generator (Main Plant)
Manufacturer	Kohler
Model Number	80PROZJ81
Quantity/Type	1 / Diesel
Equipment IDs	
Installation Date	1995
Capacity	130 kW
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	120/208V

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	1	
Vibration/Noise	NA	
Support/Base Damage	2	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	NA	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	NA	
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions	
1-5	

Comments: Not in operation. Recently run for outage.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Equalization Basin No.2 Coarse Bubble Diffusers
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	1995
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	1	
Vibration/Noise	1	
Support/Base Damage	NA	
Paint/Coating Damage	NA	galvanized
Labeling Missing (Y/N)	NA	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	3	galvanized
Motors	2	See EQ Blowers
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating: 1 | 2 | 3 | **4** | 5

Equipment Exceptions	
1-5	

Comments: Viewed in operation.
No air from 50% of diffusers.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Equalization Basin No.1 Coarse Bubble Diffusers
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	2002
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	1	
Leakage	1	
Vibration/Noise	1	
Support/Base Damage	1	
Paint/Coating Damage	NA	galvanized
Labeling Missing (Y/N)	N	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	2	
Motors	2	See EQ Blowers
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating: **1** 2 3 4 5

Equipment Exceptions: 1-5

Comments: Viewed in operation.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Primary Clarifier No.2- Flight and Drive
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	1/2 hp
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	3	
Leakage	NA	
Vibration/Noise	1	
Support/Base Damage	2	
Paint/Coating Damage	3	
Labeling Missing (Y/N)	Y	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	3	
Instruments	NA	
Local Control Station/Panel	2	
Other	4	Control Panel

Overall Rating: 1 | 2 | **3** | 4 | 5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:
Weirs are in good shape
Rotary scum skimmer needs to be replaced

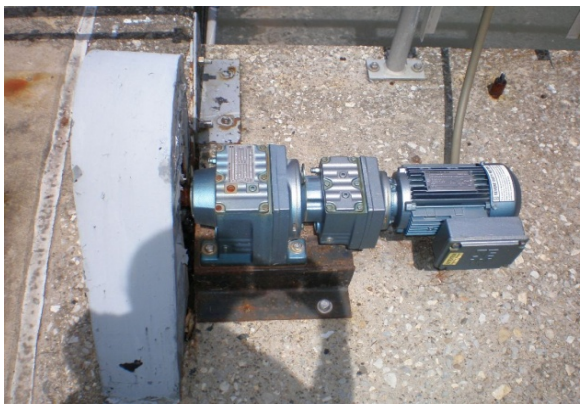
Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:



Equipment Description	Primary Clarifier No.1- Flight and Drive
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	1/2
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	NA	
Vibration/Noise	1	
Support/Base Damage	2	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	Y	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	2	Drive recently replaced
Instruments	NA	
Local Control Station/Panel	2	
Other	4	Control Panel

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions

1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:
Weirs are in good shape
Rotary scum skimmer needs to be replaced

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Equalization Blower No.
Manufacturer	WispAir
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	1	
Vibration/Noise	2	Rotary- noisey by design, some reduction could be useful
Support/Base Damage	1	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	NA	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	2	
Instruments	NA	
Local Control Station/Panel	NA	
Other	3	Electrical Panel and Breaker Panel

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Equalization Blower No.
Manufacturer	WispAir
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	1	
Vibration/Noise	2	Rotary- noisey by design, some reduction could be useful
Support/Base Damage	1	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	NA	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	1	Motor recently replaced
Instruments	NA	
Local Control Station/Panel	NA	
Other	3	Electrical Panel and Breaker Panel

Overall Rating	1	**2**	3	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Rotary Fine Screen Taconic
Manufacturer	Romat Fine Screen
Model Number	16MS-0.250-75
Quantity/Type	1
Equipment IDs	
Installation Date	2004
Capacity	1270 gpm
Motor Manuf.	Lakeside Equipment Corp.
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	1	
Leakage	1	
Vibration/Noise	1	
Support/Base Damage	1	
Paint/Coating Damage	1	
Labeling Missing (Y/N)	NA	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	1	
Motors	1	
Instruments	1	
Local Control Station/Panel	1	
Other		

Overall Rating: **1** | 2 | 3 | 4 | 5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Rotary Fine Screen Bedford
Manufacturer	Romat Fine Screen
Model Number	16MS-0.250-75
Quantity/Type	1
Equipment IDs	
Installation Date	2004
Capacity	1270 gpm
Motor Manuf.	Lakeside Equipment Corp.
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	1	
Leakage	1	
Vibration/Noise	1	
Support/Base Damage	1	
Paint/Coating Damage	1	
Labeling Missing (Y/N)	NA	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	1	
Motors	1	
Instruments	1	
Local Control Station/Panel	1	
Other		

Overall Rating	1	2	3	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Influent Pumps
Manufacturer	KSB
Model Number	KRTK 100-251-190-1750 RPM
Quantity/Type	3 / Submersible
Equipment IDs	
Installation Date	
Capacity	85-350 gpm @ 26'TDH
Motor Manuf.	
HP/RPM/V/FLA	10HP
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	1	
Vibration/Noise	2	
Support/Base Damage	2	
Paint/Coating Damage	3	
Labeling Missing (Y/N)	Y	
Other	NA	
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	2	
Motors	3	
Instruments	NA	
Local Control Station/Panel	NA	
Other	NA	

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions	
1-5	

Comments: One Out of Service. Motor being serviced, out for one month.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Static Screens
Manufacturer	Vulcan Industries
Model Number	Vulcan Static Screens
Quantity/Type	2 /
Equipment IDs	
Installation Date	1995
Capacity	
Motor Manuf.	300 gpm@300 mg/l TSS
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	4	
Leakage	3	
Vibration/Noise	NA	
Support/Base Damage	3	
Paint/Coating Damage	4	
Labeling Missing (Y/N)	Y	
Other	NA	
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	4	
Motors	5	Out of Service
Instruments	NA	
Local Control Station/Panel	4	Electrical Panel
Other	4	

Overall Rating: 1 | 2 | 3 | **4** | 5

Equipment Exceptions	
1-5	

Comments: Out of Service. Screen removed. Flow passing through units.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Grit Classifier
Manufacturer	Waste Tech
Model Number	
Quantity/Type	1 /
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	1	
Vibration/Noise	1	
Support/Base Damage	1	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	Y	
Other	NA	
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves		
Motors		
Instruments		
Local Control Station/Panel		
Other		Some rust on grit pump

Overall Rating	1	**2**	3	4	5

Equipment Exceptions	
1-5	

Comments: Very little grit being cleared. Five gallon bucket for collection.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Vortex Grit Separator
Manufacturer	Hayward Gordon
Model Number	CR4-7
Quantity/Type	1 /
Equipment IDs	
Installation Date	
Capacity	250 gpm @26' TDH
Motor Manuf.	TEFC
HP/RPM/V/FLA	10HP
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	3	
Leakage	NA	
Vibration/Noise	1	
Support/Base Damage	2	
Paint/Coating Damage	3	
Labeling Missing (Y/N)	NA	
Other	NA	
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	1	
Instruments	NA	
Local Control Station/Panel	1	
Other	2	Some rust on grit pump

Overall Rating: 1 **2** 3 4 5

Equipment Exceptions	
1-5	

Comments: Reviewed in service. Not pulling much, because none coming in.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:
Bypass channel

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment *Level & Location:*

Inventory Information:

Equipment Description	Main Plant Influent Grinder
Manufacturer	Muffin Monster
Model Number	3000-24
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	720 gpm
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	NA	
Vibration/Noise	NA	
Support/Base Damage	1	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	NA	
Other	NA	
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	2	
Instruments	NA	
Local Control Station/Panel	2	
Other		

Overall Rating	1	**2**	3	4	5

Equipment Exceptions	
1-5	

Comments: Standby service depending on remote screens. Not seen in operation. Rated (2) if operable.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Belt Filter Press
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	NA	
Vibration/Noise	NA	
Support/Base Damage	2	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	NA	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	3	
Motors	3	
Instruments	NA	
Local Control Station/Panel	NA	
Other	4	Polymer system OOS

Overall Rating: 1 **2** 3 4 5

Equipment Exceptions	
1-5	

Comments: Rated (2) IF functional (not in operation, condition unknown)

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Trickling Filter Recycle Pumps
Manufacturer	Fairbanks Morse Pump Corp.
Model Number	4" Model B5442V vertical dry pit non-clog
Quantity/Type	2 /
Equipment IDs	
Installation Date	
Capacity	250 gpm @32' TDH/700gpm @55'TDH
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	3	
Leakage	2	
Vibration/Noise	NA	
Support/Base Damage	3	
Paint/Coating Damage	3	
Labeling Missing (Y/N)	Y	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	3	
Motors	3	
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating	1	2	**3**	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Trickling Filter Recycle Pumps
Manufacturer	Fairbanks Morse Pump Corp.
Model Number	4" Model B5442V vertical dry pit non-clog
Quantity/Type	2 /
Equipment IDs	
Installation Date	
Capacity	250 gpm @32' TDH/700gpm @55'TDH
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	3	
Leakage	2	
Vibration/Noise	NA	
Support/Base Damage	3	
Paint/Coating Damage	3	
Labeling Missing (Y/N)	Y	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	3	
Motors	3	
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating	1	2	**3**	4	5

Equipment Exceptions	
1-5	

Comments: One pump was missing (OOS).

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Sludge Storage Tank Mixer (Old Digester No.1)
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	3	
Leakage	Na	
Vibration/Noise	NA	
Support/Base Damage	NA	
Paint/Coating Damage	3	
Labeling Missing (Y/N)	Y	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	NA	
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating	1	2	**3**	4	5

Equipment Exceptions	
1-5	

Comments: Observed operating

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Sludge Pumps
Manufacturer	ITT Marlow, Inc
Model Number	PE61-A
Quantity/Type	3 / Dual Plunger
Equipment IDs	
Installation Date	
Capacity	57gpm @ 62 strokes/min @ 60'TDH
Motor Manuf.	
HP/RPM/V/FLA	.5HP
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	5	
Leakage	4	
Vibration/Noise	NA	Not observed operating.
Support/Base Damage	4	
Paint/Coating Damage	5	
Labeling Missing (Y/N)	Y	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	4	
Motors	5	
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating: 1 | 2 | 3 | 4 | **5**

Equipment Exceptions	
1-5	

Comments: One is Out of Service; One is missing.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Trickling Filter Blowers
Manufacturer	
Model Number	
Quantity/Type	2 /
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	5	
Leakage	NA	
Vibration/Noise	NA	OOS
Support/Base Damage	4	
Paint/Coating Damage	5	
Labeling Missing (Y/N)	Y	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves		
Motors		
Instruments		
Local Control Station/Panel		
Other		

Overall Rating	1	2	3	4	**5**

Equipment Exceptions	
1-5	

Comments: Out of Service. Question on if they are required anymore.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Trickling Filter No.2 Distributer Arms
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	3	
Leakage	NA	
Vibration/Noise	NA	
Support/Base Damage	NA	
Paint/Coating Damage	NA	
Labeling Missing (Y/N)	Y	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	2	
Motors	NA	
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating	1	2	**3**	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Trickling Filter No.1 Distributer Arms
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	3	
Leakage	NA	
Vibration/Noise	NA	
Support/Base Damage	NA	
Paint/Coating Damage	NA	
Labeling Missing (Y/N)	Y	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	4	
Motors	NA	
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating	1	2	3	**4**	5

Equipment Exceptions	
1-5	

Comments: Clogged at inspection. Not rotating.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Secondary Clarifier No. 2 - Flight & Drive
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	NA	
Vibration/Noise	1	
Support/Base Damage	2	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	Y	
Other		

Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	2	
Instruments	NA	
Local Control Station/Panel	2	
Other		

Overall Rating	1	**2**	3	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Secondary Clarifier No. 1 - Flight & Drive
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	4	
Leakage	NA	
Vibration/Noise	NA	Not operating
Support/Base Damage	3	
Paint/Coating Damage	4	
Labeling Missing (Y/N)	Y	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	4	
Instruments	NA	
Local Control Station/Panel	3	
Other		

Overall Rating: 1 | 2 | 3 | **4** | 5

Equipment Exceptions	
1-5	

Comments: Out of service- flight and chain not operating

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

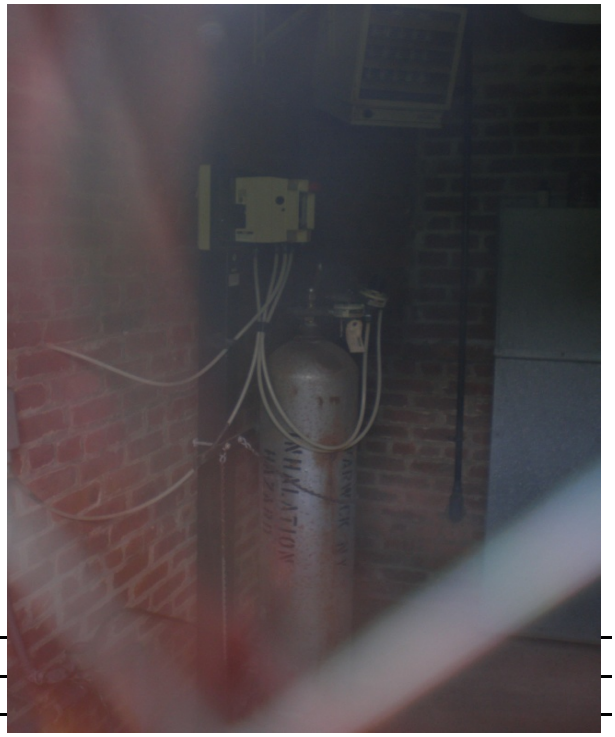
Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Standby Chlorine System
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	



Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	NA	
Leakage	NA	
Vibration/Noise	NA	
Support/Base Damage	NA	
Paint/Coating Damage	NA	
Labeling Missing (Y/N)	NA	
Other	NA	
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	NA	
Instruments	NA	
Local Control Station/Panel	NA	
Other	NA	

Overall Rating	1	2	3	4	**5**

Equipment Exceptions	
1-5	

Comments:	Standby chlorine building locked (not accessible). Chlorine canister is a potential saftey hazard. Removal should be considered. Out of Service.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Microfiltration System
Manufacturer	Pall Corp
Model Number	
Quantity/Type	3 Racks/ 44 module/rack (membranes are <0.1 micron pore size)
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	Goulds: (2 Feed Pumps; 3 Recirc Pumps; 3 Filtration Pumps)
HP/RPM/V/FLA	
Drive Type	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	Small signs of rust
Leakage	1	
Vibration/Noise	1	
Support/Base Damage	1	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	Y	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	1	
Motors	2	
Instruments	1	
Local Control Station/Panel	1	
Other		

Overall Rating: 1 **2** 3 4 5

Equipment Exceptions: 1-5

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Rapid Sand Filters
Manufacturer	
Model Number	
Quantity/Type	3 /
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	4	
Leakage	NA	
Vibration/Noise	NA	
Support/Base Damage	NA	
Paint/Coating Damage	4	
Labeling Missing (Y/N)	N	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	NA	
Instruments	NA	
Local Control Station/Panel	NA	
Other	NA	

Overall Rating: 1 | 2 | 3 | **4** | 5

Equipment Exceptions	
1-5	

Comments: 4 -Media and auxillary equipment valves
Filter No.1 OOS due to underdrain repair. Others will liekly need repairs.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	UV System
Manufacturer	
Model Number	
Quantity/Type	3 /
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	MP Pumps Series 30
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	1	
Vibration/Noise	1	
Support/Base Damage	2	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	N	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	2	
Motors	NA	
Instruments	1	
Local Control Station/Panel	1	
Other		

Overall Rating	1	**2**	3	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment *Level & Location:*

Inventory Information:

Equipment Description	Generator (Microfiltration Bldg)
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	1	
Leakage	1	
Vibration/Noise	NA	
Support/Base Damage	1	
Paint/Coating Damage	1	
Labeling Missing (Y/N)	N	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	NA	
Instruments	NA	
Local Control Station/Panel	NA	
Other	NA	

Overall Rating	1	2	3	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Propane Tank
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	1	
Leakage	1	
Vibration/Noise	NA	
Support/Base Damage	1	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	N	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	NA	
Motors	NA	
Instruments	NA	
Local Control Station/Panel	NA	
Other	NA	

Overall Rating	1	**2**	3	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Filter Backwash Pumps
Manufacturer	
Model Number	
Quantity/Type	2 /
Equipment IDs	
Installation Date	
Capacity	1040gpm each @23'TDH
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	2	
Vibration/Noise	2	
Support/Base Damage	2	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	NA	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	2	
Motors	2	
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating	1	**2**	3	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Rapid Sand Filter Blowers
Manufacturer	
Model Number	
Quantity/Type	2 /
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	1	
Vibration/Noise	1	
Support/Base Damage	2	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	NA	
Other		

Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	2	
Motors	2	
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating: 1 **2** 3 4 5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Domestic Water Pumps
Manufacturer	
Model Number	
Quantity/Type	2 /
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	3	
Leakage	1	
Vibration/Noise	NA	
Support/Base Damage	2	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	NA	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	2	
Motors	2	
Instruments	NA	
Local Control Station/Panel	2	
Other		

Overall Rating: 1 **2** 3 4 5

Equipment Exceptions	
1-5	

Comments: Not in use per DOH instruction.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment

Inventory Information:

Equipment Description	Filter Air Compressor
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	1	
Vibration/Noise	1	
Support/Base Damage	2	
Paint/Coating Damage	1	
Labeling Missing (Y/N)	NA	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	2	
Motors	2	
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating	1	**2**	3	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - General Equipment *Level & Location:*

Inventory Information:

Equipment Description	Mudwell Pumps
Manufacturer	
Model Number	
Quantity/Type	2 /
Equipment IDs	
Installation Date	
Capacity	103gpm each @ 20'TDH
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage	1	
Vibration/Noise	1	
Support/Base Damage	2	
Paint/Coating Damage	2	
Labeling Missing (Y/N)	NA	
Other		
Ancillary Items	1-5/NA	Comment(s)
Piping/Valves	2	
Motors	2	
Instruments	NA	
Local Control Station/Panel	NA	
Other		

Overall Rating: 1 **2** 3 4 5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - Chem. Feed Systems

Inventory Information:

Equipment Description: Chlorination System

Metering Pumps

Equipment Description	
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	

Bulk Storage Tank Data

Qty	Capacity	Manuf.	Material	ID #s

Day Tank Data

Qty	Capacity	Manuf.	Material	ID #s

Physical Condition Assessment

Components	1-5/NA	Code(s)	Comment(s)
Bulk Storage Tanks			
Day Tanks			
Transfer Pumps			
Metering Pumps			
Piping/Valves			
Instruments			
Local Control Station/Panel			
Motors			

Condition Codes

A Corrosion
B Leakage
C Vibration/Noise
D Support/Base Damage
E Paint/Coating Damage
F Labeling Missing

Overall Rating: 1 | 2 | 3 | 4 | **5**

Equipment Exceptions

1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - Chem. Feed Systems

Inventory Information:

Equipment Description: Alum System

Metering Pumps

Equipment Description	
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	

Bulk Storage Tank Data

Qty	Capacity	Manuf.	Material	ID #s

Day Tank Data

Qty	Capacity	Manuf.	Material	ID #s

Physical Condition Assessment

Components	1-5/NA	Code(s)	Comment(s)
Bulk Storage Tanks			
Day Tanks			
Transfer Pumps			
Metering Pumps			
Piping/Valves			
Instruments			
Local Control Station/Panel			
Motors			

Condition Codes

A Corrosion
B Leakage
C Vibration/Noise
D Support/Base Damage
E Paint/Coating Damage
F Labeling Missing

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions

1-5	
4	Pump

Comments: New storage tank installed during inspection July 2010

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - Chem. Feed Systems

Inventory Information:

Equipment Description: Caustic System

Metering Pumps

Equipment Description	
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	

Bulk Storage Tank Data

Qty	Capacity	Manuf.	Material	ID #s

Day Tank Data

Qty	Capacity	Manuf.	Material	ID #s

Physical Condition Assessment

Components	1-5/NA	Code(s)	Comment(s)
Bulk Storage Tanks			Containment area flooded
Day Tanks			
Transfer Pumps			
Metering Pumps			
Piping/Valves			
Instruments			
Local Control Station/Panel			
Motors			

Condition Codes

A Corrosion
B Leakage
C Vibration/Noise
D Support/Base Damage
E Paint/Coating Damage
F Labeling Missing

Overall Rating: 1 | 2 | 3 | **4** | 5

Equipment Exceptions

1-5	

Comments: Out of Service

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Mech.Assessment - Chem. Feed Systems

Inventory Information:

Equipment Description: Polymer System

Metering Pumps

Equipment Description	
Manufacturer	
Model Number	
Quantity/Type	/
Equipment IDs	
Installation Date	
Capacity	
Motor Manuf.	
HP/RPM/V/FLA	
Drive Type	

Bulk Storage Tank Data

Qty	Capacity	Manuf.	Material	ID #s

Day Tank Data

Qty	Capacity	Manuf.	Material	ID #s

Physical Condition Assessment

Components	1-5/NA	Code(s)	Comment(s)
Bulk Storage Tanks			
Day Tanks			
Transfer Pumps			
Metering Pumps			
Piping/Valves			
Instruments			
Local Control Station/Panel			
Motors			

Condition Codes

A Corrosion
B Leakage
C Vibration/Noise
D Support/Base Damage
E Paint/Coating Damage
F Labeling Missing

Overall Rating: 1 | 2 | 3 | 4 | **5**

Equipment Exceptions

1-5	

Comments: Out of Service

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Inventory Information:

Equipment Description	Echopac Level Transmitters
Manufacturer	Echopac
Model Number	
Quantity	2
Installation Date	
Equipment ID	
Voltage	
Output	
Other	Not in Service- Removed

Physical Condition Assessment

Code	Condition (A-E Instruments, F-N Panels)		
A	Corrosion	**H**	Drawings/Labeling Missing
B	Leakage/Water Damage	**I**	Insulation Wear
C	Vibration / Noise	**J**	Evidence of Overheating
D	Supports / Base Damage	**K**	Grounding Missing/Damaged
E	Leakage	**L**	Cooling System Broken
F	Covers/Doors Missing/Dama	**M**	Door Mounted Inst. Damage
G	Connections Loose/Broken	**N**	Other

Set Points

Hi-Hi Setting	
Hi Setting	
Lo Setting	
Lo-Lo Setting	

Instrument Evaluation

Instrument ID	Equipment Supplied	Mfg	Code(s)	Cond.Rating	Comments
			NA		
			NA		
			NA		
			NA		
			NA		
			NA		
			NA		
			NA		
			NA		

Panel Evaluation

Panel ID	Equipment Supplied	Mfg	Codes	Cond.Rating	Comments
			NA		
			NA		
			NA		
			NA		

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*
Never functioned properly

Performed By FT/CK/RO Date: 7/22/2010

Inventory Information:

Equipment Description	Magnetic Flow Meters
Manufacturer	Doppler
Model Number	UFM 91
Quantity	2
Installation Date	
Equipment ID	
Voltage	
Output	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	1	
Leakage/Water Damage	1	
Vibration / Noise	NA	
Supports / Base Damage	NA	
Leakage	1	
Covers/Doors Missing/Damaged	1	
Connections Loose/Broken	1	
Drawings/Labeling Missing	NA	
Insulation Wear	1	
Evidence of Overheating	NR	
Grounding Missing/Damaged	NR	
Cooling System Broken	NA	
Door Mounted Inst. Damage	1	
Other		

Overall Rating

1	2	3	4	5

Equipment Exceptions

1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Inventory Information:

Equipment Description	UV Transmitter
Manufacturer	
Model Number	
Quantity	
Installation Date	
Equipment ID	
Voltage	
Output	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	2	
Leakage/Water Damage	1	
Vibration / Noise	NA	
Supports / Base Damage	NA	
Leakage	1	
Covers/Doors Missing/Damaged	1	
Connections Loose/Broken	1	
Drawings/Labeling Missing	1	
Insulation Wear	1	
Evidence of Overheating	NR	
Grounding Missing/Damaged	NR	
Cooling System Broken	NA	
Door Mounted Inst. Damage	1	
Other		

Overall Rating	**1**	2	3	4	5

Equipment Exceptions

1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Inventory Information:

Equipment Description	Turbidity Meter
Manufacturer	
Model Number	
Quantity	5
Installation Date	
Equipment ID	
Voltage	
Output	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	1	
Leakage/Water Damage	1	
Vibration / Noise	NA	
Supports / Base Damage	1	
Leakage	1	
Covers/Doors Missing/Damaged	1	
Connections Loose/Broken	1	
Drawings/Labeling Missing	1	
Insulation Wear	1	
Evidence of Overheating	NR	
Grounding Missing/Damaged	NR	
Cooling System Broken	NA	
Door Mounted Inst. Damage		
Other		

Overall Rating	**1**	2	3	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: I&C/SCADA Assessment

Inventory Information:

Equipment Description	Dial Out Panel
Manufacturer	
Model Number	
Quantity	
Installation Date	
Equipment ID	
Voltage	
Output	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	NA	
Leakage/Water Damage	NA	
Vibration / Noise	NA	
Supports / Base Damage	NA	
Leakage	NA	
Covers/Doors Missing/Damaged	1	
Connections Loose/Broken	1	
Drawings/Labeling Missing	1	
Insulation Wear	1	
Evidence of Overheating	NR	
Grounding Missing/Damaged	NR	
Cooling System Broken	NA	
Door Mounted Inst. Damage	1	
Other		

Overall Rating	**1**	2	3	4	5

Equipment Exceptions

1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: I&C/SCADA Assessment

Inventory Information:

Equipment Description	SCADA
Manufacturer	Allen Bradley
Model Number	
Quantity	
Installation Date	
Equipment ID	
Voltage	
Output	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	NA	
Leakage/Water Damage	NA	
Vibration / Noise	NA	
Supports / Base Damage	NA	
Leakage	NA	
Covers/Doors Missing/Damaged	1	
Connections Loose/Broken	1	
Drawings/Labeling Missing	1	
Insulation Wear	1	
Evidence of Overheating	NR	
Grounding Missing/Damaged	NR	
Cooling System Broken	NA	
Door Mounted Inst. Damage	1	
Other		

Overall Rating	**1**	2	3	4	5

Equipment Exceptions

1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Inventory Information:

Equipment Description	Fire Panel
Manufacturer	
Model Number	
Quantity	
Installation Date	
Equipment ID	
Voltage	
Output	
Other	

Physical Condition Assessment

Condition	1-5/NA	Comment(s)
Corrosion	NA	
Leakage/Water Damage	NA	
Vibration / Noise	NA	
Supports / Base Damage	NA	
Leakage	NA	
Covers/Doors Missing/Damaged	1	
Connections Loose/Broken	1	
Drawings/Labeling Missing	1	
Insulation Wear	1	
Evidence of Overheating	NR	
Grounding Missing/Damaged	NR	
Cooling System Broken	NA	
Door Mounted Inst. Damage	1	
Other		

Overall Rating	**1**	2	3	4	5

Equipment Exceptions	
1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Sand Filter No.3	
Use	Filtration	
Type Of Construction	Steel	
Year Built		
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	NA	
	Leakage	NA	
	Cracking	NA	
	Spalling	NA	
	Settling	NA	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	NA	
	Pitting	NA	
	Delamination	NA	
	Freeze/Thaw Damage	NA	
Steel	Corrosion	3	
	Loss of Section	3	
	Cracking	3	
	Deformation	3	
	Fatigue	3	
	Connection Failure	3	

Ancillary Items	1-5/NA	Comment(s)
Railings	2	
Walkways	2	
Platforms	2	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | 2 | **3** | 4 | 5

Equipment Exceptions: 1-5

Comments: Heavy Rusting at top of tank

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Sand Filter No.2	
Use	Filtration	
Type Of Construction	Steel	
Year Built		
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	NA	
	Leakage	NA	
	Cracking	NA	
	Spalling	NA	
	Settling	NA	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	NA	
	Pitting	NA	
	Delamination	NA	
	Freeze/Thaw Damage	NA	
Steel	Corrosion	3	
	Loss of Section	3	
	Cracking	3	
	Deformation	3	
	Fatigue	3	
	Connection Failure	3	

Ancillary Items	1-5/NA	Comment(s)
Railings	2	
Walkways	2	
Platforms	2	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | 2 | **3** | 4 | 5

Equipment Exceptions: 1-5

Comments: Heavy Rusting at top of tank
Out os Service - bottom visible

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Sand Filter No.1	
Use	Filtration	
Type Of Construction	Steel	
Year Built		
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	NA	
	Leakage	NA	
	Cracking	NA	
	Spalling	NA	
	Settling	NA	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	NA	
	Pitting	NA	
	Delamination	NA	
	Freeze/Thaw Damage	NA	
Steel	Corrosion	3	
	Loss of Section	3	
	Cracking	3	
	Deformation	3	
	Fatigue	3	
	Connection Failure	3	

Ancillary Items	1-5/NA	Comment(s)
Railings	2	
Walkways	2	
Platforms	2	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | 2 | **3** | 4 | 5

Equipment Exceptions: 1-5

Comments: Heavy Rusting at top of tank

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Parshal Flume Tank	
Use	Flow Control	
Type Of Construction	Concrete	
Year Built		
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	2	
	Spalling	3	
	Settling	1	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	NA	
	Delamination	NA	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Ancillary Items	1-5/NA	Comment(s)
Railings	2	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions

1-5	

Comments: Has never worked as a flume- hydraulic issue.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Chlorine Contact Tank
Use	OOS
Type Of Construction	Not Visible
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Place for Photo, as applicable

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion		
	Leakage		
	Cracking		
	Spalling		
	Settling		
	Joint Damage/Failure		
	Exposed Reinfcmt/Aggreg.		
	Pitting		
	Delamination		
	Freeze/Thaw Damage		
Steel	Corrosion		
	Loss of Section		
	Cracking		
	Deformation		
	Fatigue		
	Connection Failure		

Ancillary Items	1-5/I	Comment(s)
Railings		
Walkways		
Platforms		
Stairs/Ladders		
Hatches/Doors		
Supports		
Cathodic Prot.		

Overall Rating: 1 2 3 4 5

Equipment Exceptions

1-5	

Comments: Not visible. Heavily overgrown. Out of Service.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Underground (not able to view). Possible removal from system. Not able to assess.

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Sludge Drying Bed
Use	OOS
Type Of Construction	Not Visible
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Place for Photo, as applicable

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion		
	Leakage		
	Cracking		
	Spalling		
	Settling		
	Joint Damage/Failure		
	Exposed Reinfcmt/Aggreg.		
	Pitting		
	Delamination		
	Freeze/Thaw Damage		
Steel	Corrosion		
	Loss of Section		
	Cracking		
	Deformation		
	Fatigue		
	Connection Failure		

Ancillary Items	1-5/I	Comment(s)
Railings		
Walkways		
Platforms		
Stairs/Ladders		
Hatches/Doors		
Supports		
Cathodic Prot.		

Overall Rating	1	2	3	4	5

Equipment Exceptions	
1-5	

Comments: Not visible. Heavily overgrown. Out of Service.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Storage Tank (Fuel Oil)
Use	
Type Of Construction	
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion		
	Leakage		
	Cracking		
	Spalling		
	Settling		
	Joint Damage/Failure		
	Exposed Reinfcmt/Aggreg.		
	Pitting		
	Delamination		
	Freeze/Thaw Damage		
Steel	Corrosion		
	Loss of Section		
	Cracking		
	Deformation		
	Fatigue		
	Connection Failure		

Ancillary Items	1-5/NA	Comment(s)
Railings		
Walkways		
Platforms		
Stairs/Ladders		
Hatches/Doors		
Supports		
Cathodic Prot.		

Overall Rating

1	2	3	4	5

Equipment Exceptions

1-5	

Comments: Not visible. Not able to assess.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Digester No. 2 (North)
Use	OOS
Type Of Construction	Steel/ Concrete
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	2	
	Leakage	2	
	Cracking	2	
	Spalling	2	5 - in some areas
	Settling	1	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	NA	
	Pitting	2	
	Delamination	2	
	Freeze/Thaw Damage	2	
Steel	Corrosion	3	Dome heavy corrosion
	Loss of Section	2	
	Cracking	2	
	Deformation	2	
	Fatigue	2	
	Connection Failure	2	

Ancillary Items	1-5/NA	Comment(s)
Railings	NA	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | 2 | **3** | 4 | 5

Equipment Exceptions

1-5	

Comments: Out of Service

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Digester No. 1 (South)
Use	Storage
Type Of Construction	Steel/ Concrete
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	4	
	Leakage	2	
	Cracking	3	
	Spalling	5	
	Settling	2	
	Joint Damage/Failure	2	
	Exposed Reinfcmt/Aggreg.	4	
	Pitting	3	
	Delamination	3	
	Freeze/Thaw Damage	3	Top only
Steel	Corrosion	3	
	Loss of Section	1	
	Cracking	1	
	Deformation	1	
	Fatigue	1	
	Connection Failure	1	

Ancillary Items	1-5/NA	Comment(s)
Railings	NA	Should have railings
Walkways	NA	
Platforms	NA	
Stairs/Ladders	5	Wooden stairs poor.
Hatches/Doors	5	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | 2 | 3 | **4** | 5

Equipment Exceptions

1-5	

Comments: Used as a storage tank
Top section problem. Tank OK.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Post-aeration Casade	
Use	Aeration	
Type Of Construction	Concrete	
Year Built		
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	1	
	Spalling	2	
	Settling	1	
	Joint Damage/Failure	1	
	Exposed Reinfcmt/Aggreg.	2	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Ancillary Items	1-5/NA	Comment(s)
Railings	NA	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: **1** | 2 | 3 | 4 | 5

Equipment Exceptions

1-5	

Comments: Location: Outside of Membrane Building

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Trickling Filter No.2
Use	Filtration
Type Of Construction	Steel/ Concrete
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	3	
	Cracking	2	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	NA	
	Freeze/Thaw Damage	NA	
Steel	Corrosion	1	
	Loss of Section	1	
	Cracking	1	
	Deformation	1	
	Fatigue	1	
	Connection Failure	1	

Ancillary Items	1-5/I	Comment(s)
Railings	2	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	4	Bottom ladder (same used for both tanks)
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions	
1-5	

Comments: Newer unit

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Trickling Filter No. 1 (Older)
Use	Secondary
Type Of Construction	Steel / Concrete
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	4	
	Cracking	2	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	1	
	Loss of Section	1	
	Cracking	1	
	Deformation	1	
	Fatigue	1	
	Connection Failure	1	

Ancillary Items	1-5/NA	Comment(s)
Railings	2	
Walkways	NA	
Platforms		
Stairs/Ladders	4	Lower ladder poor cond.
Hatches/Doors		
Supports		
Cathodic Prot.		

Overall Rating

1	2	3	4	5

Equipment Exceptions

1-5	

Comments: Leakage between steel and concrete.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Secondary Clarifier No. 2
Use	Settling
Type Of Construction	Concrete
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	2	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Ancillary Items	1-5/NA	Comment(s)
Railings	2	
Walkways	NA	
Platforms	2	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions

1-5	

Comments: Newer unit.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Secondary Clarifier No. 1 (Older)
Use	Settling
Type Of Construction	Concrete
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	3	
	Spalling	3	
	Settling	1	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Ancillary Items	1-5/NA	Comment(s)
Railings	2	
Walkways	NA	
Platforms	3	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | 2 | **3** | 4 | 5

Equipment Exceptions

1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Primary Clarifier No. 2
Use	Settling
Type Of Construction	Concrete
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	1	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Ancillary Items	1-5/NA	Comment(s)
Railings	2	
Walkways	NA	
Platforms	1	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions

1-5 5	Scum Skimmer

Comments: Newer. Skimmer Out Of Service

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Primary Clarifier No. 1 (Older)
Use	Settling
Type Of Construction	Concrete
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	2	
	Spalling	3	
	Settling	1	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Ancillary Items	1-5/NA	Comment(s)
Railings	2	
Walkways	NA	
Platforms	2	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions

1-5	
5	Rotary skimmer weir

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Grit Chamber	
Use		
Type Of Construction	Concrete	
Year Built		
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	1	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Ancillary Items	1-5/NA	Comment(s)
Railings	NA	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | 2 | 3 | 4 | 5

Equipment Exceptions

1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Equalization Basin No. 2	
Use	Flow control	
Type Of Construction	Concrete	
Year Built	2000	
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	1	2 - Adjacent wet well
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Ancillary Items	1-5/NA	Comment(s)
Railings	2	
Walkways	1	
Platforms	1	
Stairs/Ladders	1	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: 1 | 2 | 3 | 4 | 5

Equipment Exceptions: 1-5

Comments: Reviewed when full (in operation); could not see below the surface.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Process Tanks

General Information:

Structure Description	Equalization Basin No. 1 (Older)
Use	Flow control
Type Of Construction	Concrete
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	2	
	Spalling	3	
	Settling	1	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Ancillary Items	1-5/NA	Comment(s)
Railings	2	
Walkways	2	
Platforms	2	
Stairs/Ladders	NA	
Hatches/Doors	NA	
Supports	NA	
Cathodic Prot.	NA	

Overall Rating: **1** | 2 | 3 | 4 | 5

Equipment Exceptions

1-5	Joint between building and wet well platform separating.
3	

Comments: Reviewed when full (in operation); could not see below the surface.

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/CK/RO Date: 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Building Systems

General Information:

Structure Description	Bedford Screening Bldg	
Use	Raw sewage screening	
Type Of Construction	Block	
Year Built		
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	1	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	1	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Wood	1-5/NA	Comment(s)
Dry Rot	NA	
Warping	NA	
Splitting	NA	
Conn. Failure	NA	
Loss of Section	NA	

Ancillary Items	1-5/NA	Comment(s)
Roof	1	
Railings	NA	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	2	
Fences	NA	

Overall Rating: **1** | 2 | 3 | 4 | 5

Equipment Exceptions

1-5	

Comments: (1) Electric Heater

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/ CK/ RO **Date:** 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Building Systems

General Information:

Structure Description	Taconic Screening Bldg	
Use	Raw sewage screening	
Type Of Construction	Block	
Year Built		
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	1	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	1	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Wood	1-5/NA	Comment(s)
Dry Rot	NA	
Warping	NA	
Splitting	NA	
Conn. Failure	NA	
Loss of Section	NA	

Ancillary Items	1-5/NA	Comment(s)
Roof	1	
Railings	NA	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	2	
Fences	NA	

Overall Rating: **1** | 2 | 3 | 4 | 5

Equipment Exceptions

1-5	

Comments: (1) Electric Heater

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/ CK/ RO **Date:** 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Building Systems

General Information:

Structure Description	Blower/ MLP Control Bldg
Use	EQ Blower/ Influent Pump Control Room
Type Of Construction	Brick/Block
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	1	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	1	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Wood	1-5/NA	Comment(s)
Dry Rot	NA	
Warping	NA	
Splitting	NA	
Conn. Failure	NA	
Loss of Section	NA	

Ancillary Items	1-5/NA	Comment(s)
Roof	1	
Railings	NA	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	4	Two doors
Fences	Na	

Overall Rating: 1 **2** 3 4 5

Equipment Exceptions

1-5	
	Doors need replacement

Comments: Building #123

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/ CK/ RO **Date:** 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Building Systems

General Information:

Structure Description	Grit/ Headworks Bldg
Use	Influent Pumps/ Grit Removal
Type Of Construction	Brick/ Block
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	1	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	1	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Wood	1-5/NA	Comment(s)
Dry Rot	NA	
Warping	NA	
Splitting	NA	
Conn. Failure	NA	
Loss of Section	NA	

Ancillary Items	1-5/NA	Comment(s)
Roof	1	
Railings	2	
Walkways	2	Joints need caulking
Platforms	NA	
Stairs/Ladders	2	
Hatches/Doors	2	
Fences	NA	

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions

1-5	

Comments:
Building #153
(1) Electric heater
(1) Exhaust fan (dry well)

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/ CK/ RO **Date:** 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Building Systems

General Information:

Structure Description	Screening Bldg
Use	Screening
Type Of Construction	Brick/ Block
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	2	
	Leakage	2	
	Cracking	2	
	Spalling	2	
	Settling	2	
	Joint Damage/Failure	1	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	2	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Wood	1-5/NA	Comment(s)
Dry Rot	NA	
Warping	NA	
Splitting	NA	
Conn. Failure	NA	
Loss of Section	NA	

Ancillary Items	1-5/NA	Comment(s)
Roof	1	
Railings	NA	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	5	Two doors
Fences	NA	

Overall Rating

1	**2**	3	4	5

Equipment Exceptions

1-5	
5	Doors need replacement

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/ CK/ RO **Date:** 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Building Systems

General Information:

Structure Description	Control Bldg
Use	Sludge Pumps, Chemicals, Trickling Filter Feed Pumps, Lab
Type Of Construction	Brick
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	2	
	Leakage	2	
	Cracking	2	
	Spalling	2	
	Settling	2	
	Joint Damage/Failure	1	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	2	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Wood	1-5/NA	Comment(s)
Dry Rot	NA	
Warping	NA	
Splitting	NA	
Conn. Failure	NA	
Loss of Section	NA	

Ancillary Items	1-5/NA	Comment(s)
Roof	2	
Railings	3	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	2	
Hatches/Doors	2	Two doors
Fences	NA	

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions

1-5	
4	Hot water boiler

Comments: Brick chimney needs repointing
Broken windows

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/ CK/ RO **Date:** 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Building Systems

General Information:

Structure Description	Sand Filter Bldg
Use	Filter Pump / NaOH Pumps
Type Of Construction	Brick/ Block
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	2	
	Cracking	2	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	1	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	2	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Wood	1-5/NA	Comment(s)
Dry Rot	NA	
Warping	NA	
Splitting	NA	
Conn. Failure	NA	
Loss of Section	NA	

Ancillary Items	1-5/NA	Comment(s)
Roof	1	
Railings	2	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	2	
Hatches/Doors	2	
Fences	NA	

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions

1-5	

Comments: (2) Electric heaters - ground floor
(2) Electric heaters - basement

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/ CK/ RO **Date:** 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Building Systems

General Information:

Structure Description	Belt Filter Press Bldg	
Use	Sludge dewatering	
Type Of Construction	Brick/ Block	
Year Built		
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	1	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	1	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Wood	1-5/NA	Comment(s)
Dry Rot	NA	
Warping	NA	
Splitting	NA	
Conn. Failure	NA	
Loss of Section	NA	

Ancillary Items	1-5/NA	Comment(s)
Roof	1	
Railings	NA	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	2	
Fences	NA	

Overall Rating: 1 | **2** | 3 | 4 | 5

Equipment Exceptions

1-5	
4	Roll-up garage door

Comments: (4) Electric heaters

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/ CK/ RO **Date:** 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Building Systems

General Information:

Structure Description	Maintenance Garage	
Use	Maintenance Garage	
Type Of Construction	Steel	
Year Built		
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	NA	
	Leakage	NA	
	Cracking	NA	
	Spalling	NA	
	Settling	NA	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	NA	
	Pitting	NA	
	Delamination	NA	
	Freeze/Thaw Damage	NA	
Steel	Corrosion	2	
	Loss of Section	2	
	Cracking	2	
	Deformation	2	
	Fatigue	2	
	Connection Failure	2	

Wood	1-5/NA	Comment(s)
Dry Rot	NA	
Warping	NA	
Splitting	NA	
Conn. Failure	NA	
Loss of Section	NA	

Ancillary Items	1-5/NA	Comment(s)
Roof	2	
Railings	NA	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	2	
Fences	NA	

Overall Rating

1	**2**	3	4	5

Equipment Exceptions

1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/ CK/ RO **Date:** 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Building Systems

General Information:

Structure Description	Microfiltration Building
Use	UV / Filtration
Type Of Construction	Brick/ Block
Year Built	
LxWxH (above grade)	x x
Basement Dimensions	

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	1	
	Leakage	1	
	Cracking	1	
	Spalling	1	
	Settling	1	
	Joint Damage/Failure	1	
	Exposed Reinfcmt/Aggreg.	1	
	Pitting	1	
	Delamination	1	
	Freeze/Thaw Damage	1	
Steel	Corrosion	1	
	Loss of Section	1	
	Cracking	1	
	Deformation	1	
	Fatigue	1	
	Connection Failure	1	

Wood	1-5/NA	Comment(s)
Dry Rot	NA	
Warping	NA	
Splitting	NA	
Conn. Failure	NA	
Loss of Section	NA	

Ancillary Items	1-5/NA	Comment(s)
Roof	1	
Railings	NA	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	1	
Fences	NA	

Overall Rating: **1** | 2 | 3 | 4 | 5

Equipment Exceptions	
1-5	

Comments:
(2) Propane heaters
(2) Exhaust fans

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/ CK/ RO **Date:** 7/22/2010

Town of Bedford Asset Condition Assessment and Valuation - DOCS WWTP

Facilities Audit: Structural Assessment - Building Systems

General Information:

Structure Description	Standby Chlorine Bldg	
Use	Not in Use	
Type Of Construction	Brick	
Year Built		
LxWxH (above grade)	x	x
Basement Dimensions		

Physical Condition Assessment

	Condition	1-5/NA	Comment(s)
Concrete/Masonry	Corrosion	3	
	Leakage	3	
	Cracking	3	
	Spalling	3	
	Settling	3	
	Joint Damage/Failure	NA	
	Exposed Reinfcmt/Aggreg.	NA	
	Pitting	NA	
	Delamination	NA	
	Freeze/Thaw Damage	NA	
Steel	Corrosion	NA	
	Loss of Section	NA	
	Cracking	NA	
	Deformation	NA	
	Fatigue	NA	
	Connection Failure	NA	

Wood	1-5/NA	Comment(s)
Dry Rot	4	Roof
Warping		
Splitting	4	Roof area
Conn. Failure		
Loss of Section		

Ancillary Items	1-5/NA	Comment(s)
Roof	4	Slate roof missing some tiles
Railings	NA	
Walkways	NA	
Platforms	NA	
Stairs/Ladders	NA	
Hatches/Doors	3	
Fences	NA	

Overall Rating: 1 | 2 | 3 | **4** | 5

Equipment Exceptions

1-5	

Comments:

Process Condition Assessment (to be completed at interviews)

	1	2	3	4	5
Reliability					
O&M Performance					
Capacity					
Regulatory					
Overall					

Comments:

Operational History *(Note any operational data available from O&M interviews)*

Performed By: FT/ CK/ RO **Date:** 7/22/2010

Town of Bedford

321 Bedford Road • Bedford Hills, NY 10507

Appendix F

Calculation of Replacement Cost New

MALCOLM PIRNIE

Equipment Description	Installation 20%	Piping 15%	Electrical 12%	I&C 15%	MFR Services 5%	Coatings 8%	O&P 15%	Total *(Calculation of Replacement Cost New)*	Notes
Digester No. 1 Mixer	$8,000	$6,000	$4,800	$6,000	$2,000	$3,200	$6,000	$76,000	(1),(4)
Digester No. 2	$20,000	$15,000	$12,000	$15,000	$5,000	$8,000	$15,000	$190,000	(1)
Belt Filter Press	$48,000	$36,000	$28,800	$36,000	$12,000	$19,200	$36,000	$456,000	(1)
Equalization Basin Blowers No. 1	$1,500	$1,125	$900	$1,125	$375	$600	$1,125	$14,250	(2)
Equalization Basin Blowers No. 2	$1,500	$1,125	$900	$1,125	$375	$600	$1,125	$14,250	(2)
Sludge Pump No. 1	$4,400	$3,300	$2,640	$3,300	$1,100	$1,760	$3,300	$41,800	(1)
Sludge Pump No. 2	$4,400	$3,300	$2,640	$3,300	$1,100	$1,760	$3,300	$41,800	(1),(5)
Sludge Pump No. 3	$4,400	$3,300	$2,640	$3,300	$1,100	$1,760	$3,300	$41,800	(1),(5)
Storage Tank (Fuel Oil) No. 2	$800	$600	$480	$600	$200	$320	$600	$7,600	(2),(4)
Trickling Filter Feed Pump No. 1	$4,600	$3,450	$2,760	$3,450	$1,150	$1,840	$3,450	$43,700	(1)
Trickling Filter Feed Pump No. 2	$4,600	$3,450	$2,760	$3,450	$1,150	$1,840	$3,450	$43,700	(1)
Trickling Filter Recycle Pump No. 1	$4,600	$3,450	$2,760	$3,450	$1,150	$1,840	$3,450	$43,700	(1)
Trickling Filter Recycle Pump No. 2	$4,600	$3,450	$2,760	$3,450	$1,150	$1,840	$3,450	$43,700	(1)
Trickling Filter Recycle Pump No. 3	$4,600	$3,450	$2,760	$3,450	$1,150	$1,840	$3,450	$43,700	(1),(5)
Emergency Generator No. 2 (Micro-Filtration Bldg)	$27,000	$20,250	$16,200	$20,250	$6,750	$10,800	$20,250	$256,500	(3)
Emergency Generator No.1 (Main Plant)	$12,000	$9,000	$7,200	$9,000	$3,000	$4,800	$9,000	$114,000	(3),(4)
Equalization Basin No. 1 Coarse Bubble Diffusers	$8,000	$6,000	$4,800	$6,000	$2,000	$3,200	$6,000	$76,000	(1)
Equalization Basin No. 2 Coarse Bubble Diffusers	$8,000	$6,000	$4,800	$6,000	$2,000	$3,200	$6,000	$76,000	(1)
Vortext Grit System and Grit Classifier	$20,400	$15,300	$12,240	$15,300	$5,100	$8,160	$15,300	$193,800	(1)
Influent Grinder	$4,100	$3,075	$2,460	$3,075	$1,025	$1,640	$3,075	$38,950	(1)
Grit Pump	$2,400	$1,800	$1,440	$1,800	$600	$960	$1,800	$22,800	(1)
Influent Pump No. 1	$1,700	$1,275	$1,020	$1,275	$425	$680	$1,275	$16,150	(1)
Influent Pump No. 2	$1,700	$1,275	$1,020	$1,275	$425	$680	$1,275	$16,150	(1)
Influent Pump No. 3	$1,700	$1,275	$1,020	$1,275	$425	$680	$1,275	$16,150	(1),(5)
Rotary Fine Screen Bedford	$13,600	$10,200	$8,160	$10,200	$3,400	$5,440	$10,200	$129,200	(1)
Rotary Fine Screen Taconic	$13,600	$10,200	$8,160	$10,200	$3,400	$5,440	$10,200	$129,200	(1)
Membrane Microlftration System	$219,000	$164,250	$131,400	$164,250	$54,750	$87,600	$164,250	$2,080,500	(1)
Ultraviolet Chamber No. 1	$11,000	$8,250	$6,600	$8,250	$2,750	$4,400	$8,250	$104,500	(1)
Ultraviolet Chamber No. 2	$11,000	$8,250	$6,600	$8,250	$2,750	$4,400	$8,250	$104,500	(1)
Ultraviolet Chamber No. 3	$11,000	$8,250	$6,600	$8,250	$2,750	$4,400	$8,250	$104,500	(1)
Ultraviolet Recirculation Pump No. 1	$800	$600	$480	$600	$200	$320	$600	$7,600	(2)
Ultraviolet Recirculation Pump No. 2	$800	$600	$480	$600	$200	$320	$600	$7,600	(2)
Parshall Flumes	$2,000	$1,500	$1,200	$1,500	$500	$800	$1,500	$19,000	(1),(4),(5)
Primary Clarifier No. 1 Flight and Drive	$11,000	$8,250	$6,600	$8,250	$2,750	$4,400	$8,250	$104,500	(1)
Primary Clarifier No. 2 Flight and Drive	$11,000	$8,250	$6,600	$8,250	$2,750	$4,400	$8,250	$104,500	(1)
RSF System	$77,000	$57,750	$46,200	$57,750	$19,250	$30,800	$57,750	$731,500	(1),(4)
Alum Addition	$3,000	$2,250	$1,800	$2,250	$750	$1,200	$2,250	$28,500	(2)
Alum Addition	$3,000	$2,250	$1,800	$2,250	$750	$1,200	$2,250	$28,500	(2)
Standby Chlorine System	$400	$300	$240	$300	$100	$160	$300	$3,800	(1)
Domestic Water Pump No. 1	$1,500	$1,125	$900	$1,125	$375	$600	$1,125	$14,250	(2)
Domestic Water Pump No. 2	$1,500	$1,125	$900	$1,125	$375	$600	$1,125	$14,250	(2)
Polymer Addition	$3,000	$2,250	$1,800	$2,250	$750	$1,200	$2,250	$28,500	(2)
Soda Ash (Caustic) Addition	$3,000	$2,250	$1,800	$2,250	$750	$1,200	$2,250	$28,500	(2),(4)
Secondary Clarifier No. 1 Flight and Drive	$13,000	$9,750	$7,800	$9,750	$3,250	$5,200	$9,750	$123,500	(1)
Secondary Clarifier No. 2 Flight and Drive	$13,000	$9,750	$7,800	$9,750	$3,250	$5,200	$9,750	$123,500	(1)
Dechlorination System	$400	$300	$240	$300	$100	$160	$300	$3,800	(1),(4)

Equipment Description	Installation 20%	Piping 15%	Electrical 12%	I&C 15%	MFR Services 5%	Coatings 8%	O&P 15%	Total *(Calculation of Replacement Cost New)*	Notes
Static Screen No. 1	$2,300	$1,725	$1,380	$1,725	$575	$920	$1,725	$21,850	(1)
Static Screen No. 2	$2,300	$1,725	$1,380	$1,725	$575	$920	$1,725	$21,850	(1)
Trickling Filter No. 1	$21,000	$15,750	$12,600	$15,750	$5,250	$8,400	$15,750	$199,500	(1),(4)
Trickling Filter No. 1 Blower	$1,500	$1,125	$900	$1,125	$375	$600	$1,125	$14,250	(2),(4)
Trickling Filter No. 1 Distributer Arms	$6,000	$4,500	$3,600	$4,500	$1,500	$2,400	$4,500	$57,000	(1),(4)
Trickling Filter No. 2	$21,000	$15,750	$12,600	$15,750	$5,250	$8,400	$15,750	$199,500	(1)
Trickling Filter No. 2 Blower	$1,500	$1,125	$900	$1,125	$375	$600	$1,125	$14,250	(2)
Trickling Filter No. 2 Distributer Arms	$6,000	$4,500	$3,600	$4,500	$1,500	$2,400	$4,500	$57,000	(1)
Storage Tank (Fuel Oil) No. 1	$800	$600	$480	$600	$200	$320	$600	$7,600	(2),(4),(5)
Fire Panel									(4), (10)
Magnetic Flow Meter No. 1									(4), (10)
Magnetic Flow Meter No. 2									(4), (10)
Dial Out Panel									(4), (10)
SCADA									(4), (10)
Ultraviolet Transmitter									(4),(9)
Turbidimeters									(4),(5),(10)
Membrane Feed Pump No. 2									(4),(6)
Grit Classifier									(4),(8)
Membrane Feed Pump No. 1									(4),(6)
Membrane Filtration Pump No. 1									(4),(6)
Membrane Filtration Pump No. 2									(4),(6)
Membrane Filtration Pump No. 3									(4),(6)
Filter Air Compressor									(4),(7)
Filter Backwash Blowers									(4),(7)
Filter Backwash Blowers									(4),(7)
Filter Backwash Pump No. 1									(4),(7)
Filter Backwash Pump No. 2									(4),(7)
Mudwell Pump No. 1									(4),(7)
Mudwell Pump No. 2									(4),(7)
Total	**$689,000**	**$516,750**	**$413,400**	**$516,750**	**$172,250**	**$275,600**	**$516,750**	**$6,545,500**	

(1) Equipment price based on quotation from distributer
(2) Equipment price based on data from previous projects
(3) Equipment price based on RS Means catalog
(4) Estimated installation (or major rehabilation) date designated to coincide with year of most significant renovation.
(5) Assets deemed "Not Rated" if not in service, not accessible, missing, and/or not visible for review; excluded from condition assessment ratings.
(6) Included in Membrane Microfiltration System
(7) Included in RSF System
(8) Included in Vortext Grit System and Grit Classifier
(9) Included in UV treatment quotation
(10) Included in Instrumentation & Controls

Building Description	Building Size (ft²)	$/ft²	Floors	Total Building Cost *(Calculation of Replacement Cost New)*	Note
Control Building	512	$750	2	$768,000	(1)
Microfiltration Building	3,566	$750	1	$2,674,500	(1)
Taconic Screen Building	250	$750	1	$187,500	(3)
Bedford Hills Screen Building	250	$750	1	$187,500	(3)
Blower Building	196	$750	1	$147,000	(3)
Grit / Headworks Building	388	$750	2	$582,000	(1)
Screenings Building	149	$750	1	$111,750	(3)
Rapid Sand Filter Building	483	$750	2	$724,500	(3)
Belt Filter Press Building	545	$750	1	$408,750	(1)
Maintenance Garage	1,056	$350	1	$369,600	(2),(3)
Standby Chlorine Building	90	$750	1	$67,500	(1)
Dechlorination Station	25	$750	1	$15,000	(1)
Total				**$6,243,600**	

Notes
(1) FRP building, quote based on previous projects
(2) Pre-engineered metal building, $/ft² lower
(3) Estimated installation (or major rehabilation) date designated to coincide with year of most significant renovation.

Tanks Description	Quantity (yds)	Price of concrete ($/yd³)	Concrete cost 56%	Excavation 25%	Yard Piping 15%	Misc. Metals 12%	Coatings 12%	O&P 15%	Total *(Calculation of Replacement Cost New)*	Notes
Grit chamber	40	$800	$32,000	$8,000	$4,800	$3,840	$3,840	$4,800	$57,280	(2)
Equalization tank #1	55	$800	$44,000	$11,000	$6,600	$5,280	$5,280	$6,600	$78,760	
Equalization tank #2	70	$800	$56,000	$14,000	$8,400	$6,720	$6,720	$8,400	$100,240	
Equalization wet well	45	$800	$36,000	$9,000	$5,400	$4,320	$4,320	$5,400	$64,440	
Valve pit	pre-cast	-	$7,500	$1,875	$1,125	$900	$900	$1,125	$13,425	(1),(4)
Meter pit	pre-cast	-	$7,500	$1,875	$1,125	$900	$900	$1,125	$13,425	(1)
Influent parshall flumes	15	$800	$12,000	$3,000	$1,800	$1,440	$1,440	$1,800	$21,480	(2)
Primary clarifier #1	60	$800	$48,000	$12,000	$7,200	$5,760	$5,760	$7,200	$85,920	
Primary clarifier #2	60	$800	$48,000	$12,000	$7,200	$5,760	$5,760	$7,200	$85,920	(4)
Trickling filter #1	50	$800	$40,000	$10,000	$6,000	$4,800	$4,800	$6,000	$71,600	(4)
Trickling filter #2	50	$800	$40,000	$10,000	$6,000	$4,800	$4,800	$6,000	$71,600	(4)
Secondary clarifier #1	65	$800	$52,000	$13,000	$7,800	$6,240	$6,240	$7,800	$93,080	
Secondary clarifier #2	65	$800	$52,000	$13,000	$7,800	$6,240	$6,240	$7,800	$93,080	
Digester 1	40	$800	$32,000	$8,000	$4,800	$3,840	$3,840	$4,800	$57,280	(3)
Digester 2	30	$800	$24,000	$6,000	$3,600	$2,880	$2,880	$3,600	$42,960	(3)
Rapid sand filtration	50	$800	$40,000	$10,000	$6,000	$4,800	$4,800	$6,000	$71,600	
Chlorine contact tank	pre-cast	-	$20,000	$5,000	$3,000	$2,400	$2,400	$3,000	$35,800	(4)
Cascade	5	$800	$4,000	$1,000	$600	$480	$480	$600	$7,160	
Misc. concrete pads	15	$800	$12,000	$3,000	$1,800	$1,440	$1,440	$1,800	$21,480	
Total			**$607,000**	**$151,750**	**$91,050**	**$72,840**	**$72,840**	**$91,050**	**$1,086,530**	

Notes

(1) Pre-cast concrete, cost based on project experience

(2) heights estimated based on project experience because no detailed drawings available

(3) height of tank estimated to be double effective depth, liquid volume consistant with report

(4) Estimated installation (or major rehabilation) date designated to coincide with year of most significant renovation.

Town of Bedford

321 Bedford Road • Bedford Hills, NY 10507

Appendix G

Estimated Useful Life and Depreciation

MALCOLM PIRNIE

Estimated Useful Lives													
Building	Process Tank	Process Tank Mech. Equip.	Pump	Storage Tank (Chem./Fuel)	Large Mech. Equip.	Odor Control System	Outfall	Membrane Unit	UV Unit	I&C	Generator	Small Chem. System	Blowers
80	50	20	20	30	20	25	50	20	20	15	25	15	10

	Useful Life Depreciation (%)													
Condition Rating	Building	Process Tank	Process Tank Mech. Equip.	Pump	Storage Tank (Chem./Fuel)	Large Mech. Equip.	Odor Control System	Outfall	Membrane Unit	UV Unit	I&C	Generator	Small Chem. System	Blowers
1	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
2	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
3	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
4	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
5	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	100%

Town of Bedford

321 Bedford Road • Bedford Hills, NY 10507

Appendix H

Supporting Valuation Information

MALCOLM PIRNIE

Equipment

Condition Assessment Summary and Valuation Calculations

Valuation Year: 2010														
Equipment Description	Notes	Estimated Installation (or Major Rehab) Date	Condition Rating	Asset Depreciation Based on Condition	Estimated Useful Service Life (Yrs)	Estimated Service Life Remaining (Yrs)	Replacement Cost New	Indexed Accumulated Depreciation	Replacement Cost New Less Depreciation	Current Date Value	Purchase Date Value	Original Cost	Accumulated Depreciation	Original Cost Less Depreciation (Net Book Value)
Digester No. 1 Mixer	(1),(4)	1992	2	40%	20	12	$76,000	$30,400	$45,600	8,789	4,985	$43,107	$17,243	$25,864
Digester No. 2	(1)	1992	3	60%	50	20	$190,000	$68,400	$121,600	8,789	4,985	$107,768	$38,796	$68,971
Belt Filter Press	(1)	1986	2	40%	20	12	$456,000	$182,400	$273,600	8,789	4,295	$222,842	$89,137	$133,705
Equalization Basin Blowers No. 1	(2)	1992	2	40%	10	6	$14,250	$5,700	$8,550	8,789	4,985	$8,083	$3,233	$4,850
Equalization Basin Blowers No. 2	(2)	2002	2	40%	10	6	$14,250	$5,700	$8,550	8,789	6,538	$10,601	$4,240	$6,360
Sludge Pump No. 1	(1)	1990	5	95%	20	1	$41,800	$39,710	$2,090	8,789	4,732	$22,506	$21,380	$1,125
Sludge Pump No. 2	(1)	1990	5	95%	20	1	$41,800	$39,710	$2,090	8,789	4,732	$22,506	$21,380	$1,125
Sludge Pump No. 3	(1)	1992	5	95%	20	1	$41,800	$37,620	$4,180	8,789	4,985	$23,709	$21,338	$2,371
Storage Tank (Fuel Oil) No. 2	(2),(4),(5)	1992	Not Rated	100%	30	0	$7,600	$7,600	$0	8,789	4,985	$4,311	$4,311	$0
Trickling Filter Feed Pump No. 1	(1)	1992	3	60%	20	8	$43,700	$26,220	$17,480	8,789	4,985	$24,787	$14,872	$9,915
Trickling Filter Feed Pump No. 2	(1)	1992	3	60%	20	8	$43,700	$26,220	$17,480	8,789	4,985	$24,787	$14,872	$9,915
Trickling Filter Recycle Pump No. 1	(1)	1992	3	60%	20	8	$43,700	$26,220	$17,480	8,789	4,985	$24,787	$14,872	$9,915
Trickling Filter Recycle Pump No. 2	(1)	1992	3	60%	20	8	$43,700	$26,220	$17,480	8,789	4,985	$24,787	$14,872	$9,915
Trickling Filter Recycle Pump No. 3	(1),(5)	1992	Not Rated	100%	20	0	$43,700	$43,700	$0	8,789	4,985	$24,787	$24,787	$0
Emergency Generator No. 2 (Micro-Filtration Bldg)	(3)	2002	2	40%	25	15	$256,500	$82,080	$174,420	8,789	6,538	$190,810	$61,059	$129,751
Emergency Generator No.1 (Main Plant)	(3),(4)	1992	2	40%	25	15	$114,000	$45,600	$68,400	8,789	4,985	$64,661	$25,864	$38,796
Equalization Basin No. 1 Coarse Bubble Diffusers	(1)	1992	1	10%	20	18	$76,000	$7,600	$68,400	8,789	4,985	$43,107	$4,311	$38,796
Equalization Basin No. 2 Coarse Bubble Diffusers	(1)	1992	4	80%	20	4	$76,000	$60,800	$15,200	8,789	4,985	$43,107	$34,486	$8,621
Vortext Grit System and Grit Classifier	(1)	2002	2	40%	20	12	$193,800	$77,520	$116,280	8,789	6,538	$144,168	$57,667	$86,501
Influent Grinder	(1)	2002	2	40%	20	12	$38,950	$15,580	$23,370	8,789	6,538	$28,975	$11,590	$17,385
Grit Pump	(1)	2002	2	40%	20	12	$22,800	$9,120	$13,680	8,789	6,538	$16,961	$6,784	$10,177
Influent Pump No. 1	(1)	2002	2	40%	20	12	$16,150	$6,460	$9,690	8,789	6,538	$12,014	$4,806	$7,208
Influent Pump No. 2	(1)	2002	2	40%	20	12	$16,150	$6,460	$9,690	8,789	6,538	$12,014	$4,806	$7,208
Influent Pump No. 3	(1)	2002	2	40%	20	12	$16,150	$6,460	$9,690	8,789	6,538	$12,014	$4,806	$7,208
Rotary Fine Screen Bedford	(1)	2004	1	10%	20	18	$129,200	$12,920	$116,280	8,789	7,115	$104,594	$10,459	$94,135
Rotary Fine Screen Taconic	(1)	2004	1	10%	20	18	$129,200	$12,920	$116,280	8,789	7,115	$104,594	$10,459	$94,135
Membrane Microlftration System	(1)	2002	2	40%	20	12	$2,080,500	$832,200	$1,248,300	8,789	6,538	$1,547,684	$619,073	$928,610
Ultraviolet Chamber No. 1	(1)	2002	2	40%	20	12	$104,500	$41,800	$62,700	8,789	6,538	$77,738	$31,095	$46,643
Ultraviolet Chamber No. 2	(1)	2002	2	40%	20	12	$104,500	$41,800	$62,700	8,789	6,538	$77,738	$31,095	$46,643
Ultraviolet Chamber No. 3	(1)	2002	2	40%	20	12	$104,500	$41,800	$62,700	8,789	6,538	$77,738	$31,095	$46,643
Ultraviolet Recirculation Pump No. 1	(2)	2002	2	40%	20	12	$7,600	$3,040	$4,560	8,789	6,538	$5,654	$2,261	$3,392
Ultraviolet Recirculation Pump No. 2	(2)	2002	2	40%	20	12	$7,600	$3,040	$4,560	8,789	6,538	$5,654	$2,261	$3,392
Parshall Flumes	(1),(4)	1992	5	95%	50	3	$19,000	$6,840	$12,160	8,789	4,985	$10,777	$3,880	$6,897
Primary Clarifier No. 1 Flight and Drive	(1)	1992	2	40%	20	12	$104,500	$41,800	$62,700	8,789	4,985	$59,272	$23,709	$35,563
Primary Clarifier No. 2 Flight and Drive	(1)	1992	2	40%	20	12	$104,500	$41,800	$62,700	8,789	4,985	$59,272	$23,709	$35,563
RSF System	(1),(4)	1992	4	80%	20	4	$731,500	$585,200	$146,300	8,789	4,985	$414,905	$331,924	$82,981
Alum Addition	(2)	1992	2	40%	15	9	$28,500	$11,400	$17,100	8,789	4,985	$16,165	$6,466	$9,699
Alum Addition	(2)	1992	2	40%	15	9	$28,500	$11,400	$17,100	8,789	4,985	$16,165	$6,466	$9,699
Standby Chlorine System	(1)	1992	5	95%	15	1	$3,800	$3,610	$190	8,789	4,985	$2,155	$2,048	$108
Domestic Water Pump No. 1	(2)	2000	5	95%	20	1	$14,250	$7,125	$7,125	8,789	6,221	$10,087	$5,043	$5,043
Domestic Water Pump No. 2	(2)	2000	5	95%	20	1	$14,250	$7,125	$7,125	8,789	6,221	$10,087	$5,043	$5,043
Polymer Addition	(2)	1992	5	95%	15	1	$28,500	$27,075	$1,425	8,789	4,985	$16,165	$15,357	$808
Soda Ash (Caustic) Addition	(2),(4)	1992	4	80%	15	3	$28,500	$22,800	$5,700	8,789	4,985	$16,165	$12,932	$3,233
Secondary Clarifier No. 1 Flight and Drive	(1)	1992	2	40%	20	12	$123,500	$49,400	$74,100	8,789	4,985	$70,049	$28,020	$42,029
Secondary Clarifier No. 2 Flight and Drive	(1)	1992	4	80%	20	4	$123,500	$98,800	$24,700	8,789	4,985	$70,049	$56,039	$14,010
Dechlorination System	(1),(4)	1992	4	80%	15	3	$3,800	$3,040	$760	8,789	4,985	$2,155	$1,724	$431

(Condition Assessment Summary and Valuation Calculations for Equipment continued)

Valuation Year: 2010														
Equipment Description	**Notes**	**Estimated Installation (or Major Rehab) Date**	**Condition Rating**	**Asset Depreciation Based on Condition**	**Estimated Useful Service Life (Yrs)**	**Estimated Service Life Remaining (Yrs)**	**Replacement Cost New**	**Indexed Accumulated Depreciation**	**Replacement Cost New Less Depreciation**	**Current Date Value**	**Purchase Date Value**	**Original Cost**	**Accumulated Depreciation**	**Original Cost Less Depreciation (Net Book Value)**
Static Screen No. 1	(1)	1992	4	80%	20	4	$21,850	$17,480	$4,370	8,789	4,985	$12,393	$9,915	$2,479
Static Screen No. 2	(1)	1992	4	80%	20	4	$21,850	$17,480	$4,370	8,789	4,985	$12,393	$9,915	$2,479
Trickling Filter No. 1	(1),(4)	1992	3	60%	50	20	$199,500	$71,820	$127,680	8,789	4,985	$113,156	$40,736	$72,420
Trickling Filter No. 1 Blower	(2),(4)	1992	5	95%	10	1	$14,250	$13,538	$713	8,789	4,985	$8,083	$7,678	$404
Trickling Filter No. 1 Distributer Arms	(1),(4)	1992	4	80%	20	4	$57,000	$45,600	$11,400	8,789	4,985	$32,330	$25,864	$6,466
Trickling Filter No. 2	(1)	1992	2	40%	50	30	$199,500	$71,820	$127,680	8,789	4,985	$113,156	$40,736	$72,420
Trickling Filter No. 2 Blower	(2)	1992	5	95%	10	1	$14,250	$13,538	$713	8,789	4,985	$8,083	$7,678	$404
Trickling Filter No. 2 Distributer Arms	(1)	1992	3	60%	20	8	$57,000	$34,200	$22,800	8,789	4,985	$32,330	$19,398	$12,932
Storage Tank (Fuel Oil) No. 1	(2),(4),(5)	1992	Not Rated	100%	30	0	$7,600	$7,600	$0	8,789	4,985	$4,311	$4,311	$0
Fire Panel	(4), (10)	1992	1	10%	15	14								
Magnetic Flow Meter No. 1	(4), (10)	1992	1	10%	15	14								
Magnetic Flow Meter No. 2	(4), (10)	1992	1	10%	15	14								
Dial Out Panel	(4), (10)	1992	1	10%	15	14								
SCADA	(4), (10)	1992	1	10%	15	14								
Ultraviolet Transmitter	(4),(9)	1992	1	10%	15	14								
Turbidimeters	(4),(5),(10)	1992	1	10%	15	14								
Membrane Feed Pump No. 2	(4),(6)	1992	2	40%	20	12								
Grit Classifier	(4),(8)	1992	2	40%	20	12								
Membrane Feed Pump No. 1	(4),(6)	1992	2	40%	20	12								
Membrane Filtration Pump No. 1	(4),(6)	1992	2	40%	20	12								
Membrane Filtration Pump No. 2	(4),(6)	1992	2	40%	20	12								
Membrane Filtration Pump No. 3	(4),(6)	1992	2	40%	20	12								
Filter Air Compressor	(4),(7)	1992	2	40%	20	12								
Filter Backwash Blowers	(4),(7)	1992	2	40%	10	6								
Filter Backwash Blowers	(4),(7)	1992	2	40%	10	6								
Filter Backwash Pump No. 1	(4),(7)	1992	2	40%	20	12								
Filter Backwash Pump No. 2	(4),(7)	1992	2	40%	20	12								
Mudwell Pump No. 1	(4),(7)	1992	2	40%	20	12								
Mudwell Pump No. 2	(4),(7)	1992	2	40%	20	12								
Total							**$6,545,500**	**$3,083,510**	**$3,461,990**			**$4,268,289**	**$1,947,903**	**$2,320,387**

(1) Equipment price based on quotation from distributer
(2) Equipment price based on data from previous projects
(3) Equipment price based on RS Means catalog
(4) Estimated installation (or major rehabilation) date designated to coincide with year of most significant renovation.
(5) Assets deemed "Not Rated" if not in service, not accessible, missing, and/or not visible for review; excluded from condition assessment ratings.
(6) Included in Membrane Microfiltration System
(7) Included in RSF System
(8) Included in Vortext Grit System and Grit Classifier
(9) Included in UV treatment quotation
(10) Included in Instrumentation & Controls

Buildings

Condition Assessment Summary and Valuation Calculations

Valuation Year: 2010														
Building Description	**Note**	**Estimated Installation (or Major Rehab) Date**	**Condition Rating**	**Useful Life Depreciation**	**Estimated Useful Service Life (Yrs)**	**Estimated Service Life Remaining (Yrs)**	**Replacement Cost New**	**Indexed Accumulated Depreciation**	**Replacement Cost New Less Depreciation**	**Current Date Value**	**Purchase Date Value**	**Original Cost**	**Accumulated Depreciation**	**Original Cost Less Depreciation (Net Book Value)**
Control Building	(1)	2002	2	40%	80	48	$768,000	$76,800	$691,200	8,789	6,538	$571,315	$57,132	$514,184
Microfiltration Building	(1)	2001	2	40%	80	48	$2,674,500	$300,881	$2,373,619	8,789	6,343	$1,930,220	$217,150	$1,713,070
Taconic Fine Screen Building	(3)	1986	3	60%	80	32	$187,500	$56,250	$131,250	8,789	4,295	$91,629	$27,489	$64,140
Bedford Hills Fine Screen Building	(3)	1986	2	40%	80	48	$187,500	$56,250	$131,250	8,789	4,295	$91,629	$27,489	$64,140
Blower Building	(3)	1986	3	60%	80	32	$147,000	$44,100	$102,900	8,789	4,295	$71,837	$21,551	$50,286
Grit / Headworks Building	(1)	2002	1	10%	80	72	$582,000	$58,200	$523,800	8,789	6,538	$432,950	$43,295	$389,655
Screenings Building	(3)	1992	2	40%	80	48	$111,750	$25,144	$86,606	8,789	4,985	$63,384	$14,261	$49,123
Rapid Sand Filter Building	(3)	1995	2	40%	80	48	$724,500	$135,844	$588,656	8,789	5,471	$450,998	$84,562	$366,436
Belt Filter Press Building	(1)	1985	2	40%	80	48	$408,750	$127,734	$281,016	8,789	4,195	$195,101	$60,969	$134,132
Maintenance Garage	(2),(3)	1992	3	60%	80	32	$369,600	$83,160	$286,440	8,789	4,985	$209,636	$47,168	$162,468
Standby Chlorine Building	(1)	1953	3	60%	80	32	$67,500	$40,500	$27,000	8,789	600	$4,608	$2,765	$1,843
Dechlorination Station	(1)	1995	3	60%	80	32	$15,000	$2,813	$12,188	8,789	5,471	$9,337	$1,751	$7,587
Total							**$6,243,600**	**$1,007,676**	**$5,235,924**			**$4,122,646**	**$605,581**	**$3,517,064**

Notes

(1) FRP building, quote based on previous projects

(2) Pre-engineered metal building, $/ft² lower

(3) Estimated installation (or major rehabilation) date designated to coincide with year of most significant renovation.

Concrete Tanks

Condition Assessment Summary and Valuation Calculations

Valuation Year: 2010														
Process Description	**Notes**	**Estimated Installation (or Major Rehab) Date**	**Condition Rating**	**Useful Life Depreciation**	**Estimated Useful Service Life (Yrs)**	**Estimated Service Life Remaining (Yrs)**	**Replacement Cost New**	**Indexed Accumulated Depreciation**	**Replacement Cost New Less Depreciation**	**Current Date Value**	**Purchase Date Value**	**Original Cost**	**Accumulated Depreciation**	**Original Cost Less Depreciation (Net Book Value)**
Grit chamber	(2)	2002	1	10%	50	45	$57,280	$5,728	$51,552	8789	6538	$42,611	$4,261	$38,350
Equalization tank #1		1992	1	10%	50	45	$78,760	$7,876	$70,884	8789	4985	$44,673	$4,467	$40,205
Equalization tank #2		1992	1	10%	50	45	$100,240	$10,024	$90,216	8789	4985	$56,856	$5,686	$51,170
Equalization wet well		2002	1	10%	50	45	$64,440	$6,444	$57,996	8789	6538	$47,937	$4,794	$43,143
Valve pit	(1),(4)	1992	3	60%	50	20	$13,425	$4,833	$8,592	8789	4985	$7,615	$2,741	$4,873
Meter pit	(1)	1900	1	10%	50	45	$13,425	$1,343	$12,083	8789	97	$148	$15	$133
Influent parshall flumes	(2)	1992	1	10%	50	45	$21,480	$2,148	$19,332	8789	4985	$12,183	$1,218	$10,965
Primary clarifier #1		1953	1	10%	50	45	$85,920	$8,592	$77,328	8789	600	$5,866	$587	$5,279
Primary clarifier #2	(4)	2002	2	40%	50	30	$85,920	$13,747	$72,173	8789	6538	$63,916	$10,227	$53,689
Trickling filter #1	(4)	1992	3	60%	50	20	$71,600	$25,776	$45,824	8789	4985	$40,611	$14,620	$25,991
Trickling filter #2	(4)	1992	3	60%	50	20	$71,600	$25,776	$45,824	8789	4985	$40,611	$14,620	$25,991
Secondary clarifier #1		2002	4	80%	50	10	$93,080	$14,893	$78,187	8789	6538	$69,242	$11,079	$58,163
Secondary clarifier #2		2002	4	80%	50	10	$93,080	$14,893	$78,187	8789	6538	$69,242	$11,079	$58,163
Digester 1 (Storage Tank)	(3)	1953	2	40%	50	30	$57,280	$22,912	$34,368	8789	600	$3,910	$1,564	$2,346
Digester 2 (Storage Tank)	(3)	1992	2	40%	50	30	$42,960	$15,466	$27,494	8789	4985	$24,367	$8,772	$15,595
Rapid sand filtration		1992	2	40%	50	30	$71,600	$25,776	$45,824	8789	4985	$40,611	$14,620	$25,991
Chlorine contact tank	(4)	1992	2	40%	50	30	$35,800	$12,888	$22,912	8789	4985	$20,306	$7,310	$12,996
Cascade		2002	2	40%	50	30	$7,160	$1,146	$6,014	8789	6538	$5,326	$852	$4,474
Misc. concrete pads		1900	1	10%	50	45	$21,480	$2,148	$19,332	8789	97	$237	$24	$213
Total							**$1,086,530**	**$222,408**	**$864,123**			**$596,268**	**$118,535**	**$477,733**

Notes

(1) Pre-cast concrete, cost based on project experience

(2) Height estimated based on project experience; no detailed drawings available

(3) Height of tank estimated to be double effective depth, liquid volume consistant with report

(4) Estimated installation (or major rehabilation) date designated to coincide with year of most significant renovation.