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EXECUTIVE SUMMARY

1. INTRODUCTION AND BACKGROUND

1.1. INTRODUCTION

After careful consideration, the New York City Department of Environmental Protection (NYCDEP or Department) has identified the Mosholu Golf Course in Van Cortlandt Park in the Borough of the Bronx, New York City (Mosholu Site) as the preferred site for the Croton Water Treatment Plant (WTP). As stated in the December 31, 2003 Draft Supplemental Environmental Impact Statement (Draft SEIS):

"The purposed of the Draft SEIS is to evaluate the potential for environmental impacts at three alternative sites so an informed decision can be made about the selection of a preferred site."

The NYCDEP proposes to design, construct and place into operation a 290 million-gallon-perday (mgd) Croton WTP to provide filtration and disinfection of the Croton Water Supply System (Croton System) to New York City water users. The Croton System is part of an intricate water system that provides New York City (City) with its drinking water. This Final Supplemental Environmental Impact Statement (Final SEIS) describes the proposed Croton WTP that would filter and disinfect the Croton System. The Final SEIS has been prepared to assess the potential for significant adverse environmental impacts that are predicted to occur at the Mosholu Site and the other alternative sites that were under consideration for siting the WTP facility.

The Final SEIS includes a description of the proposed project; engineering analyses leading to the proposed project; methods of the analysis; descriptions of existing environmental conditions and future conditions without the project; and, potential impacts of the project during the WTP's operation and during its construction. The Final SEIS describes the potential mitigation measures to reduce both the potential impacts from the facility's operation and construction. This Final SEIS includes information requested by the public, to the extent that information is available, and updates to information presented in the Draft SEIS. Attached to the Final SEIS are responses to comments that the Department has received on the Draft SEIS.

The proposed WTP also includes the construction of new water tunnels to connect the proposed plant to the New Croton Aqueduct (NCA) and the improvements and rehabilitation of structures related to distribution connections at and near Jerome Park Reservoir also in the Bronx. The purpose of the Final SEIS is to evaluate the potential for environmental impacts at the Mosholu Site and the two alternative sites: the Eastview Site in the Town of Mount Pleasant, Westchester County; and, the Harlem River Site, also in the Bronx., The Eastview Site alternative includes work at other sites along the NCA or possible future connection to the proposed Kensico-City Tunnel¹.

It should be noted, the inspection and Baseline Rehabilitation of the NCA and its appurtenant structures would occur irrespective of the location of the proposed plant. The repairs are required

¹ The Kensico-City Tunnel is the early design stage and will be subject to an independent environmental review.

to preserve the NCA and prevent it from falling into disrepair. If however the Croton WTP were sited at the Eastview Site, the NCA would be required to be pressurized. The work on the NCA for pressurization would take place after the completion of the WTP construction. In addition, the NCA repairs are necessary before improvements are made to another intricate part of the City's water supply system, the Catskill Aqueduct. In order to maintain redundancy in the City's water supply during improvements to the Catskill Aqueduct, which are planned in the future, this inspection and baseline rehabilitation work to the NCA would be accelerated in time and completed before it is necessary to shutdown the Catskill Aqueduct prior to the start of any proposed work on the Croton WTP. The NCA pressurization is analyzed as part of the Final SEIS, but the Baseline Rehabilitation of the NCA is the subject of a separate environmental review since it would occur irrespective of the sting or construction of the Croton WTP.

This Final SEIS enumerates all the various impacts of the proposed plant at three sites. The Final SEIS lays out plans to avoid or mitigate potential significant adverse impacts to the maximum extent that is possible to be protective of public health and safety and the environment



Croton Watershed and Reservoirs

Croton Water Treatment Plant

1.2. DESCRIPTION OF THE CROTON WATER SUPPLY SYSTEM

The Croton System is the oldest of City's three systems (Croton, Catskill and Delaware) that provide drinking water to the City and upstate communities. Although it was once the only reservoir system supplying water from outside the City, the Croton System is now the smallest of the three systems. The Croton watershed is a series of interconnected reservoirs and lakes in northern Westchester and Putnam Counties (Figure 1). The Jerome Park Reservoir, a distribution reservoir, is located at the downstream end of the Croton System and is the point at which Croton water enters City's water distribution system. The Croton System provides an average of approximately 10 percent of the City's average daily demand. During droughts, the Croton System provides up to 30 percent of in-City consumption. Croton water is primarily used in low-lying areas of the Bronx and Manhattan, where the water can be conveyed by gravity. Two pump stations, the Jerome Avenue Pump Station and the Mosholu Pump Station, can supply additional Croton water to the Intermediate and High Level service areas, normally served by the Catskill and Delaware Systems.

1.2.1. Existing Croton Water Supply Users

1.2.1.1. Upstate Users

Croton water is conveyed to Westchester County residents directly from the reservoir system and through the NCA, which extends from New Croton Reservoir in Westchester County to the 135th Street Pumping Station in Manhattan. The City provides approximately 200 mgd of water to upstate consumers based on maximum day demand of which approximately 114 mgd is supplied to southern Westchester County. The Croton System provides approximately eight percent (~9 mgd) of the water demand of upstate consumers that use New York City water. The Catskill and Delaware Systems provide the remainder of the upstate demand. The NCA is responsible for delivering approximately three (3) mgd of the nine (9) mgd demand, with the remainder being withdrawn directly from the reservoirs in the Croton System. The following users withdraw water directly from the Croton System: Katonah Water District, Carmel Water District, Hunter Brook Cove Water District, Amawalk Department of Environmental Facilities, Town of Southeast (Brewster), Village of Croton-on-Hudson Water District, Putnam County Hospital, and the Village of Ossining.

The seven municipalities connected to the NCA are the Town of New Castle, the Village of Ossining, the Village of Briarcliff Manor, the Village of Sleepy Hollow, the Village of Tarrytown, the Village of Irvington, and the Village of Ardsley (supplied by United Water New Rochelle). Most of these users do not use Croton water as their primary source (usually the Catskill/Delaware System is the primary source).

1.2.1.2. New York City Users

1.2.1.2.1. The Croton System

Year 2000 census data were used to develop population profiles of Bronx and Manhattan residents typically served by the Croton System as compared to the population profiles of those

areas not typically served by the Croton System. Typical Croton water users are those who are regular users of the Low Level Croton Water Supply System². These are the users who receive Croton water by gravity. The typical Croton user in the Bronx represents 23.4 percent of the Bronx population. Approximately 48.7 percent of this population is between the ages of 20–54 years, with approximately 20.5 percent over the age of 55. The per capita income of the typical Croton user is approximately \$13,801 per year. Approximately one-quarter of the typical Croton water users are below the poverty line.

The typical Croton distribution areas in Manhattan encompass approximately 450,793 people, which represent 29.3 percent of the population. In Manhattan, unlike the Bronx, there are significant differences between the typical Croton users and those who receive their water from the Catskill and Delaware Water Systems. Of the approximately 451,000 persons typically receiving Croton water, approximately 70.0 percent are minority, contrasted with just 44.5 percent minority among the approximately 1,086,000 primarily non-Croton users. The percentage of persons of Hispanic origin in the typical Croton user group is approximately 10 percent higher than in the non-Croton water users. In addition, the region typically receiving Croton water is characterized by a larger Afro-American population (30.8 percent vs. 8.8 percent). On the other hand, the Asian population is slightly lower in the Croton users region (5.0 percent vs. 11.2 percent) than the region serviced primarily by the Catskill and Delaware Water Systems. The per capita income of the typical Croton user in Manhattan is approximately \$30,114.per year. Approximately 27.3 percent of Manhattan Croton users are below the poverty line. In contrast, 16.1 percent of those persons receiving primarily non-Croton water are below the poverty level, and the area as a whole is characterized by a per capita income of \$54,141 per year.

1.2.1.2.2. The Catskill/Delaware Systems

The typical non-Croton water user on average is not statistically different than the typical Croton user in Bronx County. Approximately 49.6 percent of the typical non-Croton water user population is between the ages of 20–54 years, with approximately 16.8 percent over the age of 55. The non-Croton water distribution area is characterized by a slightly higher Afro-American population (33.0 percent vs. 25.6 percent) and a slightly smaller Caucasian population (12.8 percent vs. 20.1 percent) than the Croton water distribution area. Percentage of Asians, Hispanics, Native Americans, two or more races and Others categories within the two groups are quite similar. Approximately 81.7 percent of the Catskill/Delaware water users are minorities, approximately 8 percent higher than the typical Croton user area. The percentage of persons below the poverty line in the Catskill/Delaware distribution system is approximately eight percent greater than that within the Croton system. There is no significant difference between the per capita income of the typical Catskill/Delaware and typical Croton user.

 $^{^2}$ City water is supplied at three pressures, Low, Intermediate and High, depending on the height of the neighborhoods above Sea Level. The Croton System supplies the Low Level service by gravity. Croton water can be supplied to the Intermediate and High Level service by pumping the water. The Catskill/Delaware System water arrives in the City by gravity at the High Level. The High Level service pressure can be reduced in the distribution system to supply the other systems.

1.3. NEED FOR THE PROJECT

The project is being proposed to meet the public water supply and public health needs of the City, and to comply with State and Federal drinking water standards and regulations.

The New York State Department of Health (NYSDOH) and the United States Environmental Protection Agency (USEPA) have mandated the filtration and disinfection of the Croton water supply to comply with standards set forth in sub-part 5.1 of Chapter 1, New York State Sanitary Code, and the USEPA Surface Water Treatment Rule (SWTR), a National Primary Drinking Water Regulation promulgated under the Safe Drinking Water Act (SDWA), 1974. The City did not apply for Filtration Avoidance for Croton water discharged into the NCA in 1991 under the SWTR because the NYCDEP believed that Croton water would require filtration. Instead, in 1992 the City entered into a Stipulation Agreement with NYSDOH for filtration of Croton water. Subsequently, in 1993, USEPA issued a determination pursuant to the SWTR, requiring the City to filter the Croton water supply. More recently, these two regulatory agencies, USEPA and NYSDOH sought a federal court order to obligate the City to construct a Croton filtration plant according to a specified schedule.

The Croton System has provided high quality water to consumers for many years. Although Croton water currently meets all existing health-based water quality regulations, it frequently violates the aesthetic standard for color. Water quality problems have resulted in the Croton System being removed from service on numerous occasions, typically during the summer and fall months (in four of the last several years – 1992, 1993, 1994 and 1998). The entire system was shut down for most of 2000-2001 because of contaminants that leaked into the NCA.

While the USEPA distinguishes between health-based (*primary*) and aesthetic (*secondary*) standards with respect to mandatory compliance, NYSDOH considers all standards on an equal basis. Croton water consistently is more colored than the Catskill and Delaware Systems (Figure 2). The raw water, as shown in Figure 2, is above the color standard of 15 scu (standard color units), but the chlorination of the raw water generally bleaches the color and brings it into compliance in the distribution system before it reaches the consumer. The City's goal is to provide equally high quality water to all its users while minimizing the risks associated with the use of chemicals.

The 1996 SDWA Amendments and the rules and regulations that were promulgated subsequent to the SDWA Amendments placed further regulatory burdens on the Croton System. The Interim Enhanced Surface Water Treatment Rule (1998) increased required protection from microorganisms, lowered the turbidity standard, and required the covering of all new treated water reservoirs. One of the Safe Drinking Act Amendments, the Disinfectants and Disinfection Byproducts Rule has rendered the filtration of Croton water a necessity. Stage 1 of this Rule limits certain by-products of chlorination. These disinfection byproducts have been implicated as a factor in bladder, colon and rectal cancers as well as congenital fetal defects and miscarriages. Stage II of this will require measuring the disinfection byproducts as a quarterly running average and to change the points of measurement in the distribution system. As a result of these regulatory changes, without filtration the Croton water is not predicted to consistently meet the Stage 2 Disinfectants and Disinfection Byproducts Rule (Figure 3). Recently Croton



Croton System Daily Color Results for the Year 2002



Croton Haloacetic Acids Quaterly Running Averages

Croton Water Treatment Plant

water has violated turbidity in 2002, requiring the notification of all users that the water exceeded standards.

The proposed project is designed to meet all current and anticipated future water quality regulations and goals. In addition, the project is intended to allow the City to maximize the use of Croton water that can be conveyed down the NCA.

This project is required to provide filtration and disinfection of the Croton System to: 1) allow NYCDEP to continue to provide drinking water of the highest quality; 2) prevent the periodic shutdown of the Croton System, particularly at times of the year when the City water demand is at its highest; 3) meet the requirements of existing and future regulations; 4) augment the effective yield and operational flexibility of the City's overall water supply system, and 5) provide additional protection from contamination of the treated water in the water conveyances by pressurizing the treated water conveyances.

For a more detailed discussion of the need for the Croton WTP, see Section 2.3.

1.4. BACKGROUND TO THE PROJECT

In planning the Croton System in the late 1800s, the City anticipated that filtration might some day be necessary to ensure that good quality water could be delivered to consumers. Planning for the system assumed that filtration would need to be added in the future, and a large area of land immediately adjacent to Jerome Park Reservoir was reserved for that purpose. As early as 1911, the City designed a slow sand filtration system. This project was never implemented because the microbiological water quality problems being experienced were solved by a new technology, disinfection using chlorine. Subsequently, the land reserved for a treatment plant was released for other uses, which now include Lehman College, Harris Park, subway yards, Bronx High School of Science, De Witt Clinton High School, and residential buildings.

In the late 1960s episodes of insect larvae in the Croton distribution system provided the impetus to begin new, active planning for a Croton filtration plant. During the 1970s and 1980s planning progressed, and the capacity, treatment process and configuration of a proposed plant and its related distribution system components at Jerome Park Reservoir were defined. In 1993 NYCDEP initiated the State Environmental Quality Review Act (SEQRA)/City Environmental Quality Review (CEQR) processes and began preliminary design of a Croton filtration project.

City officials, NYCDEP, and the public recognized in 1994 and 1995 that many issues relating to the Croton System had changed, and that re-evaluation of threshold issues was warranted. These threshold issues were defined as fundamental decisions on the future of the Croton System that needed to be re-examined before planning, permitting and design of a proposed Croton WTP should proceed. In 1995, an Extended Special Study Program (ESSP)(1996-97) was undertaken to evaluate the following specific questions:

- 1. Given the success of NYCDEP's water conservation programs in reducing water consumption in the City, and recognizing that, on average, the Croton System supplies 10 percent of the City's water, is the Croton System still needed?
- 2. If the Croton System is still needed, how much proposed plant capacity should be provided to bring Croton water to the City?
- 3. Given the success of the City's efforts to protect the Catskill and Delaware watersheds and to obtain Filtration Avoidance of those supplies, is filtration of the Croton supply necessary?
- 4. In light of changing regulatory emphasis regarding microbiological control, disinfection byproducts, and distribution system re-growth, is the previously proposed treatment process proposed in 1993 the best for the City or should a different process be used?
- 5. Where should the Croton and its Related Facilities be located? Are there feasible alternatives to Jerome Park Reservoir?
- 6. Is treated water storage necessary for reliable system operation? If it is necessary, how much is needed?

In its Extended Special Study Program report, NYCDEP reached the following conclusions in response to these questions:

- 1. There is clearly a continued need for the Croton System. Prudent, responsible public policy dictates that the Croton System should continue to be used as an integral part of the City's water supply system.
- 2. 290-mgd capacity should be provided, by restoring but not pressurizing the NCA.
- 3. Non-filtration alternatives would improve water quality, potentially enough to meet water quality goals, but these combinations of alternatives would not meet all of NYCDEP's stated water quality goals, particularly system reliability, maximization of system supplies during droughts, and minimization of reliance on chemicals. Furthermore, some methods to meet water quality goals are not permitted by NYSDEC and preliminary concerns are that aquatic resources could be significantly impacted.
- 4. While the previously proposed treatment process would meet all treatment goals, a different treatment process (dissolved air flotation-filtration) now offers economic and other advantages. The treatment process recommended for the proposed Croton WTP comprises dissolved air flotation (DAF), ozonation and biologically active carbon filtration.
- 5. Treated water storage is necessary for reliable system operation, with a minimum usable volume of 20 million gallons³.

1.4.1. Consent Decree

In 1997 the United States of America Department of Justice brought an action against the City and the NYCDEP pursuant to Section 1414(b) of the Safe Drinking Water Act, 42 U.S.C. § 300g-3(b), for alleged violation of the Surface Water Treatment Rule, 40 C.F.R. § 141.70-141.75, promulgated under Section 1412 of the Safe Drinking Water Act, 42 U.S.C. 300g-1. The State of New York joined the suit, as plaintiff-intervener, alleging that the City was not in compliance with provisions of the State Sanitary Code, 10 NYCRR Part 5, by virtue of its failure to install filtration treatment for its Croton System. As settlement of the action against the City and the NYCDEP, the City and the NYCDEP negotiated a Consent Decree with the United States of America and the State of New York. This Consent Decree required NYCDEP, among other things, to prepare an Environmental Impact Statement (EIS) and to site, design, construct and place into operation a proposed plant to provide filtration and disinfection of the water supplied to the City from the Croton System. The Court entered the Decree on November 27th, 1998.

 $^{^{3}}$ Subsequent to the ESSP additional engineering design concluded that the 20 million gallons of storage could be reduced to 2 million gallons if some of the treated water were pumped to high pressures. The high-pressure water would be used to make up for short-term demands. This lower storage requirement was introduced into designs since 1999.

1.4.2. 1999 Croton Water Treatment Plant

In compliance with the Consent Decree, public hearings on this Scope of Work for an EIS began in February 1998 to receive comments that were considered in developing the conceptual design. The Final Scope of Work for the EIS was issued on July 1998.

According to the Consent Decree, eight new water treatment plant sites were evaluated, in addition to Jerome Park Reservoir. Four of these sites were located in the Bronx, and the other four were in Westchester County. The nine site alternatives were the following:

- Cove Site Alternative at New Croton Reservoir, Town of Yorktown, Westchester County
- Mount Pleasant Site Alternative, Town of Mount Pleasant, Westchester County
- Greenburgh Site Alternative, Town of Greenburgh, Westchester County
- Yonkers raceway Site Alternative, City of Yonkers, Westchester County
- Croton Woods Site Alternative, Van Cortlandt Park, Borough of the Bronx, New York City
- Mosholu Golf Course Site Alternative, Van Cortlandt Park, Borough of the Bronx, New York City
- Shandler Recreation Area, Van Cortlandt Park, Borough of the Bronx, New York City
- Jerome Park Reservoir, Borough of the Bronx, New York City
- Harris Park, Borough of the Bronx, New York City (pump station and treated water reservoir only)

The EIS for the 1999 Croton WTP equally addressed the different site alternatives and analyzed the potential environmental impacts of each site in accordance with the SEQRA/CEQR procedures. The timetable for the completion of the EIS was set by the Consent Decree milestone schedule.

Based on these sites, the proposed project and sixteen project engineering alternatives were developed and analyzed in the Final EIS. NYCDEP determined that the preferred site for the proposed plant and related facilities was the Mosholu Golf Course Site (Mosholu Site). The City Planning Commission approved the proposal on June 30, 1999 and the New York City Council approved the siting recommendation on July 21, 1999.

One of the Consent Decree milestones required the City to apply for any necessary state legislative approval and home rule messages by July 31, 1999. The City believed that no legislative approval was required, but a lawsuit brought by community groups and joined by the State of New York challenged this opinion. The U.S. District Court granted the City's motion and concluded that legislative approval was not necessary. Meanwhile, final design of the Croton WTP progressed and construction documents were in preparation while the U.S. District Court opinion was appealed to the Federal Court of Appeals. This court, in turn, referred the question to the New York State Court of Appeals. The New York State Court of Appeals determined on February 8, 2001, that state legislative approval was required to use the Mosholu Site. This decision prevented the commencement of any work at the Mosholu Site until such time that the legislative approval could be obtained.

1.4.3. Supplement to the Consent Decree

All parties signed a Supplement to the Consent Decree on December 12, 2001. It replaced the schedule in the Consent Decree with a new timetable. The document required the evaluation of two water treatment plant sites: one in the Bronx and one in Westchester County. The Eastview Site in the Town of Mount Pleasant, Westchester County, and the Harlem River Site in the Bronx were selected for further evaluation. The Supplement to the Consent Decree required the issuance of a Draft EIS by April 30, 2003. The Supplement to the Consent Decree further stipulated that the City could elect to build a water treatment plant at the Mosholu Site if the New York State Legislature approval was received by April 15, 2003, and the proposed plant would be operational by October 21, 2011, or, if later, within a timeframe acceptable to the United States and the State of New York.

1.4.4. 2003 Croton WTP EIS

The Supplement to the Consent Decree required design work to proceed at both the Eastview and Harlem River Sites simultaneously. The submission of an application for site plan approval was to commence by April 30, 2003 in the Town of Mount Pleasant, if the Eastview Site was chosen as the preferred site, or the Uniform Land Use Review Procedure (ULURP) was to begin in the City if the Harlem River Site was chosen as the preferred site. A local Site Approval application for the Town of Mount Pleasant was filed on April 30, 2003 and a ULURP application for the City was filed on April 21, 2003. The City also initiated action to secure the necessary State Legislature approval for use of the Mosholu Site. Since this was underway, the Draft EIS that was released on April 17, 2003 did not select a preferred site. Design of the proposed project proceeds for both of these sites, as well as for the Mosholu Site.

1.4.5. State Legislature's Approval of Park Alienation

Following the February 8, 2001 determination that the Legislature's approval was required for the City to build the Croton WTP at the Mosholu Site, the City made a request for the necessary approval. A home rule message was passed by the New York City Council on June 13, 2003. On June 20, 2003 the State Legislature passed a bill authorizing park alienation⁴ of certain land within Van Cortlandt Park (Park) and such legislation was signed into law by Governor George Pataki on July 22, 2003. The legislation provides for temporary alienation of portions of the Park during construction of the Croton WTP and permanent alienation of portions of the Park to operate and maintain the Croton WTP and related facilities. This legislation has allowed the reconsideration of the Mosholu Golf Course and Driving Range as a possible site for the Croton WTP. In light of these developments, it is anticipated that the parties would negotiate new milestones under the Supplement to the Consent Decree. An updated evaluation of the Mosholu Site, along with the Eastview and the Harlem River Sites, which were under consideration in the April 2003 Draft EIS, are the subject of this Final SEIS, consistent with the terms of the aforementioned home rule message and provisions of the legislation.

⁴ Alienation is the act of transferring property. In this context it refers to the transfer of parkland to another use. This requires New York State Legislative approval in New York State.

1.4.6. Draft Supplemental Environmental Impact Statement

A Draft Scope of Work for a Draft Supplemental Environmental Impact Statement (DSEIS) that considered the Eastview Site, the Mosholu Site, and the Harlem River Site was released August 22, 2003. Public meetings were held September 22, 2003 in the Town of Mount Pleasant and September 29, 2003 in the Borough of the Bronx to receive comments on the Draft Scope. A Final Scope of Work was released November 4, 2003, and the DSEIS was published December 31, 2003. Public Hearings were held February 25, 2004 in the Town of Mt. Pleasant and March 3, 2004 in the Borough of the Bronx to receive public comments on the DSEIS. The public comment period remained open until March 19, 2004. This Final Supplemental Environmental Impact Statement includes information requested by the public and updates to information presented in the Draft SEIS to the extent that this information is available. A separate document, *Response to Public Comments on the Draft SEIS for the Croton WTP*, is being released as an attachment to this document.

1.5. SITE SELECTION

1.5.1. Site Screening

In 1970, the City undertook an engineering study of the future treatment of the Croton Water Supply, including evaluation of potential sites for a WTP, and concluded that Jerome Park Reservoir in the Bronx should be the site for a proposed plant. In 1993 the NYCDEP undertook an environmental assessment of the Jerome Park Reservoir for the site of the Croton WTP. In response to public comments received on the 1993 Draft Scope of Work for an Environmental Impact Statement (EIS), another siting study for the proposed Croton WTP was initiated, to update the previous study and to consider alternatives to the Jerome Park Reservoir. This study was a three-phased, multi-criteria, focused screening process that evaluated numerous potential locations within the Bronx and Westchester County, New York. This screening effort began with 120 sites, reduced that pool to 23 alternatives, and finally six alternatives to Jerome Park Reservoir that were evaluated in depth.

Each of these screening efforts considered lot size, distance from the NCA, zoning, height, and the possibility of a willing seller. In 1995, based on public comment asking that NYCDEP consider all sites equally and not select a preferred site until the public could review new, similar impact analyses, Jerome Park Reservoir was no longer identified as a preferred site and all the alternatives under consideration at that time were considered as equal candidates.

In 1996 and 1997, based on public comment and revised site screening analyses, additional sites were identified and evaluated. Because the sites initially screened were found to be unavailable or unacceptable, screening criteria were broadened to consider smaller lots, and parks for the first time. The sites under consideration when the Draft Scope of Work for this EIS was published were:

- Cove Site Alternative at New Croton Reservoir, Town of Yorktown, Westchester County
- Mount Pleasant Site Alternative, Town of Mount Pleasant, Westchester County
- Greenburgh Site Alternative, Town of Greenburgh, Westchester County

- Yonkers Raceway Site Alternative, City of Yonkers, Westchester County
- Croton Woods Site Alternative, Van Cortlandt Park, Borough of the Bronx, New York City
- Shandler Recreation Area Site Alternative, Van Cortlandt Park, Borough of the Bronx, New York City
- Jerome Park Reservoir Site Alternative, Borough of the Bronx, New York City, and
- Harris Park Site Alternative, Borough of the Bronx, New York City (Related Facilities only).

The Mosholu Site, in Van Cortlandt Park, Borough of the Bronx, New York City, was added in May 1998 in response to public comment on the Draft Scope of Work for this EIS. The Draft EIS published in 1998 selected the Mosholu Site, but in February 2001; the use of this site was suspended pending approval from the State Legislature and in accordance to the court decision described above.

Revised siting criteria established subsequent to the February 2001 court decision include much smaller lots, greater distances from the NCA, larger changes in height, and for the first time, the consideration of land that could require the condemnation of private property. The site selection criteria were:

- 1. In accordance with the June 11, 2001 Order from the federal Magistrate, two sites must be evaluated and preliminary design started on both: one potential site must be in the Bronx and one potential site must be in Westchester County;
- 2. At least eight acres for permanent facilities, and four acres for staging, must be available;
- 3. The site must be within 8,000 feet of the NCA;
- 4. The site must be in a site zoned Manufacturing, or suitable for development by a Special Use Permit;
- 5. Access for the conveyance of materials to and from the site must be readily available from major surface roads, rail, or barge traffic on waterways; and
- 6. The site must not be immediately adjacent to schools, residences, or other sensitive receptors.

These criteria led to the choice to pursue the Harlem River Site in the Bronx and the Eastview Site in the Town of Mount Pleasant. Neither of these sites was evaluated in the 1999 Draft EIS. The Harlem Site failed to meet the size criterion used for site selection in that document. At that time, only sites greater than 15 acres were considered viable. It was also over a mile from the NCA.

The 83-acre New York City-owned Eastview Site in the Town of Mount Pleasant has long been considered the best site for a water treatment plant for the Catskill and Delaware Systems, and has been declared as the City's preferred site in a recent (July, 1998) Filtration Avoidance Determination that was required as a parallel track planning exercise from NYCDEP to USEPA. Although

NYCDEP strongly believes the Filtration Avoidance Determination would be renewed on either a temporary or permanent basis, there is no guarantee. The approval in 2000 of ultraviolet light treatment as a primary disinfectant by the NYSDOH allowed for a smaller plant footprint for both the Catskill and Delaware water treatment plant and the Croton water treatment plant. These smaller footprints now allow the design of two water treatment plants on the same site and the Eastview Site was selected as the Westchester site alternative for the Croton WTP. This site is also the preferred site for a Catskill Delaware Ultraviolet Treatment Facility (UV Facility). If it ever becomes necessary to build a Catskill Delaware water treatment plant, the UV facility could be a component of the future project.

The Harlem River Site, with a water treatment plant footprint of only 10.5 acres, also was selected as the site alternative in the Bronx. Both sites are farther from the NCA than previously considered, not at ideal hydraulic grades, and are smaller than the sites considered in 1999. They also each present unique engineering challenges compared to the sites evaluated in the past. However the other sites considered in 1999 and earlier were eliminated from the list of current candidates because they did not have any advantages over the Mosholu Site. Those sites were either in parks, adjacent to schools and residences, or were not zoned appropriately.

1.5.2. Identification of the Preferred Site

The New York City Department of Environmental Protection (NYCDEP) identifies the Mosholu Site as the preferred site for the Croton Water Treatment Plant (WTP). The following section presents the rationale for this selection. In reaching this determination, NYCDEP has considered the analyses and conclusions set out in the Final SEIS, as well as public comments received during the SEQRA review process. It has also considered the manner in which the City water supply system is operated, water quality information, and other data and information relevant to the issue of siting.

NYCDEP considers the Mosholu site as the most advantageous location for the Croton Water Treatment Plant based on a combination of compelling factors. As an operator of a public water supply system, NYCDEP must consider a variety of important factors in determining which site, on an overall basis, would be the best site for the WTP. The factors that have been considered include, among others: water system dependability, water quality, security, complexity of engineering/construction, cost, environmental impacts, environmental justice, jobs and economic development, and community benefits.

In summary, NYCDEP has selected the Mosholu Site as the preferred site for the following reasons:

• *Water system dependability:* Construction at the Mosholu Site would allow the City's Catskill/Delaware (Cat/Del) systems and the Croton System to remain separate, while still allowing for interconnections closer to the City. This creates the most diversified and redundant water supply for the City. Connecting the Croton system to the Cat/Del System at the Eastview Site would make the City more vulnerable to the possibility of a single catastrophic incident disrupting all water delivery.

- *Water quality:* The Mosholu Site is closer to the distribution system, thereby greatly reducing the risk of contamination after filtration. Additionally, water filtered at Mosholu will not require rechlorination closer to the City, which would increase the operational complexity of the system, as well as require another chlorine addition facility in the City.
- *Security*: The Mosholu Site will be constructed underground, thereby making it the most secure site. Locating the plant at the Eastview Site would consolidate critical water supply facilities at one location.
- *Engineering/Construction*: The WTP at the Eastview Site is designed so that filtered water would be delivered to the City through the New Croton Aqueduct (NCA) or the Kensico-City Tunnel (KCT). Until either of these actions is completed, treated water from Eastview would need to be conveyed through the Delaware Aqueduct. This is problematic in terms of assuring redundancy and dependability for water conveyance into the City.

Furthermore, the combination of building both the filtration and UV plants at Eastview would greatly impact the surrounding community, and could cause schedule delays for both projects, and/or increase costs because of the need to coordinate construction of both projects in the same time frame.

- *Cost:* Capital costs for construction at the Mosholu Site are \$204 million less than at Eastview. Additionally, the O & M costs at Mosholu will be at least \$11 million per year less than at the Eastview Site. Town, county and school budgets drive local tax assessments and locating the Croton WTP at Eastview makes NYC vulnerable to property tax increases over time.
- *Environmental impacts*: If built at the Mosholu Site, the Croton WTP will be built underground, and the driving range rebuilt above. The overall visual character of the site would remain more or less the same. There will be more trees cut down to build at Eastview than at Mosholu. There will be more significant traffic impacts at Eastview than at Mosholu, where construction vehicles will not pass either residential premises or businesses. No potential for significant adverse impacts, which would not be mitigated, would occur. No potential significant adverse impacts were predicted to occur as a result of the operation of the Water Treatment Plant at the Mosholu site.
- *Jobs and economic development:* By building at the Mosholu Site at least 600 construction jobs would be available in the City. Additionally, the induced economic benefits during construction of the plant in the City include an additional 456 new jobs being created.
- *Parks amenities:* Construction at the Mosholu Site obligates the City to spend \$243 million dollars to beautify and green the Bronx.

Below is a more thorough evaluation comparing and contrasting the three sites.

1.5.2.1. Environmental

As part of the site selection process potential environmental impacts at the three alternative sites were considered. Discussed below are environmental impact categories most affected by the proposed project at the three sites and a comparative assessment of the potential for environmental impacts at these sites. It should be noted that the Mosholu Site is the only site that would not result in the potential for significant unmitigated impacts as a result of construction. At the Harlem River Site, the potential for significant unmitigatable traffic impacts are predicted to occur. At the Eastview Site, when it is assumed that both the Cat/Del UV Facility and the Croton WTP would be co-located, resulting in potential significant adverse traffic impacts that could not be mitigated in the time frame necessary for construction would occur. None of the alternative sites would result in the potential for significant adverse unmitigated impacts during operation.

1.5.2.1.1. Land Use, Zoning, and Public Policy

Construction or operation of the WTP would not result in a significant impact to land use at any of the sites.

At the Mosholu Site, implementation of the proposed project would result in a two-acre area in the vicinity of the current Mosholu Golf Course clubhouse being restricted from public use. The remainder of the site would be available for public open space and recreation, including a golf driving range being rebuilt atop the WTP, in its existing location.

Construction at the Eastview Site would require local land use approvals. However, if the Eastview Site were selected, the proposed use would be consistent with the institutional/light industrial uses surrounding the site in the Grasslands Reservation, as well as the other water supply uses on the site including the proposed Catskill/Delaware Ultraviolet Light Disinfection Facility and the existing Delaware Aqueduct Shaft No. 19.

The Harlem River Site is not as-of-right and would require City Planning Commission (ULURP) approval. If the Harlem River Site were selected, the site use would change from heavy industrial to a water supply/light industrial use. However, the use of this property for the WTP would result in a loss of industrial land and direct displacement of private businesses (Xcel Concrete and a self-storage facility), potentially requiring the condemnation of railroad and utility properties. Nonetheless, the businesses on site are not unique to the area and it is likely that they would be able to relocate to other sites within the Bronx or the greater New York area, since neither of them is dependent upon access to either the river or the railroad to conduct their business.

In conclusion, all three sites are not anticipated to result in potential significant adverse impacts on land uses at the actual site, or on the land uses that surround them. The neighborhoods where they exist are not dependent on existing land uses that would be replaced by the proposed project, and the proposed project would not alter projected land use trends in the project's build year. In addition, the Mosholu and Harlem River Sites would provide for public open space as part of their construction. The Mosholu Site would provide an improved golf course, driving range, and clubhouse and the Harlem River Site may include 4.5 acres of publicly accessible open space to the waterfront along the Harlem River.

1.5.2.1.2. Visual Character

Construction or operation of the proposed WTP would not result in a significant impact to the visual character of the areas surrounding the WTP sites. Construction at the various sites would be short-term and would not result in a long-term visual change to the various sites.

During construction at the Mosholu Site, the existing site would temporarily change from a grass, landscaped golf driving range to a fenced-in construction site, including an ornamental wall along Jerome Avenue. Upon completion of construction, the site would be restored with a new clubhouse being built to the southeast of new two-story driving range tee-boxes. The site would resemble the existing driving range with the exception of the relocation of the club house, the expanded tee-boxes, and a restricted area containing a number of buildings associated with the WTP in the vicinity of the location of the current club house.

The visual character of the Eastview Site would change the most of the three sites, if the WTP were located at the site. During construction, natural vegetated areas would be cleared for construction staging and upon completion of the construction; a portion of the northwest corner of the site would be developed with a large water treatment building. The facility would be industrial in aesthetic, which is in character with the surrounding area. This would result in a long-term change in the appearance of the site.

The appearance of the Harlem River Site would be improved, if the WTP were to be located at the site. During construction, the site would resemble the current uses on site, with the exception of the self-storage facility. The site currently is occupied by industrial uses and contains no open space or natural areas. Upon completion of construction the site would contain the water treatment buildings as well as extensive natural areas including wetlands and landscaped areas. Due to the narrow configuration of this site, it would not be possible to design the facility to maintain view corridors to the waterfront.

In conclusion, the Mosholu Site would undergo the least long-term visual change of the three sites.

1.5.2.1.3. Community Facilities

Construction or operation of the proposed WTP would not result in a significant impact to community facilities at any of the sites. No community facilities would be directly impacted as a result of construction or operation of the proposed WTP at any site.

At the Mosholu Site, the existing golf driving range and club house would be temporarily displaced. The driving range would occupy an existing golf course hole within the golf course, which would be temporarily replaced by dividing one long hole into two smaller ones. The club house would be temporarily relocated to the Shandler Recreation Area. In addition, no community facilities would be affected indirectly as a result of either construction or operation of

the WTP at the Mosholu Site. Construction truck traffic would be restricted to traveling to and from the WTP site along Jerome Avenue between West 233rd Street and Bainbridge Avenue. No community facilities, with the exception of the Woodlawn Cemetery and Van Cortlandt Park's Shandler Recreation Area, are located along this corridor. It is not anticipated that the Woodlawn Cemetery or the Shandler Recreation Area would experience major inconvenience as a result of construction of the proposed WTP at the Mosholu Site.

At the Eastview Site, the Bee-Line Bus Facility would not be inconvenienced during construction. There would be sufficient capacity on Walker Road as well as Grasslands Road/Route 100C to accommodate both the buses entering and exiting the bus facility as well as the construction traffic related to the WTP construction. Only approximately one bus every two minutes would be exiting the bus facility during its peak (6:30 AM to 7:30 AM), while few construction trucks would be accessing the construction site during that hour. However, it is anticipated that traffic congestion and elevated mobile noise levels generated as a result of the construction of the WTP at the Eastview Site could result in inconvenience to community facilities along the routes utilized by truck traffic, especially with the concurrent construction of the Cat/Del UV Facility.

At the Harlem River Site, no community facilities would be affected either directly or indirectly as a result of the construction or operation of the WTP. No community facilities are currently located on the Harlem River Site. In addition, the majority of truck traffic to the site would access the site from the Major Deegan Expressway, which is adjacent to the site. Therefore it is not anticipated that construction of the WTP would result in inconvenience to community facilities in the vicinity of the site.

1.5.2.1.4. Open Space

Construction or operation of the proposed WTP would not result in a significant impact on open space at any of the proposed sites.

Construction and operation of the proposed WTP at the Mosholu Site would result in changes in open space within Van Cortlandt Park. During construction 28.5 acres within the park would be removed from public use. However, the uses within this area, including the driving range and club house, would be relocated to other parts of the Mosholu Golf Course and the Shandler Recreation Area. Therefore, these recreational uses would not be significantly affected by the construction of the WTP. Upon completion of construction, the driving range and golf course will be restored, and a new clubhouse and parking area created. Two acres would remain removed from public use permanently; these two acres would encompass the secured area around the above grade buildings associated with the WTP. Pursuant to State legislation authorizing the discontinuation of usage of the Mosholu Golf Course site as parkland, for the purpose of construction, operation and maintenance of the Croton WTP, an additional 41 acres would no longer be within the jurisdiction of the NYC Department of Parks and Recreation but would be under the jurisdiction of NYCDEP. These areas, however, would continue to be utilized for public open space and recreation.

Also, as part of the project, \$200 million will be invested in the acquisition of, and/or capital improvements to parks and recreational facilities within the Borough of the Bronx. This is in

addition to the \$43 million that was originally pledged for mitigation of certain potential impacts pursuant to the approval of the Mosholu Site under ULURP. Therefore, as a result of building the WTP at the Mosholu Site, the existing open space inventory will be improved and possibly expanded.

Construction and operation of a WTP at the Eastview Site would not affect open space within the surrounding area. The site itself is not utilized as public open space because it is owned by the City of New York and its use is restricted for security reasons; therefore, building the WTP would not displace open space. Also, the nearest open space to the site is the Kensico Dam Park and Plaza, 2.5 miles to the east. It is not anticipated that construction or operational workers would utilize the Park.

If the WTP were to be located at the Harlem River Site, an esplanade and public open space areas might be built on site. However security concerns would need to be factored into a decision to provide waterfront access. Therefore, if the WTP were located at the Harlem River Site, the open space inventory within the Bronx would potentially expand.

In conclusion, none of the sites would have the potential for significant adverse impacts on open space, and the Eastview Site is the only one that would not provide improvement to or addition to the existing open space inventory as part of the project. Building the WTP at the Mosholu Site would provide the most benefit to open space, with the investment of \$243 million into Bronx parks and recreational facilities.

1.5.2.1.5. Neighborhood Character

Construction and operation of the proposed WTP would not result in either significant or adverse impacts to neighborhood character at either the Mosholu or the Harlem River Sites. At the Eastview Site, the concurrent construction of both the Croton WTP and the Cat/Del UV Facility would cause temporary adverse neighborhood character impacts to occur.

Since uses that would be sensitive to being impacted during construction of the WTP are a significant distance from the proposed project sites, with the exception of a few residences near the Mosholu Site, traffic congestion due to construction of the proposed project would be the main contributing factor contributing to a change in a neighborhood character.

Because the Eastview Site is located approximately 1.7 miles from the nearest major transportation corridor (I-287) construction truck traffic, therefore requiring trucks to travel along local regional and local road corridors including Saw Mill River Road (Route 9A), Old Saw Mill River Road, Grasslands Road (Route 100C), and Tarrytown White Plains Road. During construction, up to approximately 900 vehicles (with both the Croton WTP and the Cat/Del UV Facility under construction) would be traveling through the area in order to access the site and nearby parking locations. As a result of this high level of project-induced traffic, it is likely that uses along routes traveled by project traffic would experience widespread congestion in the regional area, resulting in temporary inconvenience to commercial, institutional, retail, and residential uses, within the surrounding area.

Both the Harlem River and Mosholu Sites are near a major transportation corridor (the Major Deegan Expressway (Major Deegan)). In the case of the Harlem River Site, the Major Deegan Expressway is within 1,000 ft of the entrance to the site. Therefore, it is anticipated that a majority of both the workers as well as the construction truck traffic would arrive at the site via the Major Deegan and would not travel through the local communities along local streets. In addition, car and truck access to the site would be restricted. Only approximately 29 trucks would be permitted to access the site each day, the majority of construction material hauling being handled by barge. Construction workers would not be permitted to park on site, although it is anticipated that they would drive by the site as they exit the Major Deegan and head to their off-site parking locations. Construction traffic at the Mosholu Site, similar to the Harlem River Site, would not travel through the local community to access the site. As part of the project, construction truck traffic would be required to access the site by exiting the Major Deegan and traveling south along Jerome Avenue, from the West 233rd Street exit of the Major Deegan, to access the site and north on Jerome Avenue, to the West 233rd Street exit, to exit the site. This restriction would prevent truck traffic from traveling through the commercial and residential area to the south, west, and east of the site. Therefore, because of this restriction, construction truck traffic would travel to and from the site via the Major Deegan and not through the local community. Thus, it is not anticipated that the local community would experience hardship as a result of the construction of the proposed WTP at the Mosholu Site.

1.5.2.1.6. Socioeconomic Conditions

No significant adverse socioeconomic impacts would result from the implementation of the project either at the Mosholu Site or the Eastview or Harlem River Sites. The potential water rate impact would range from \$44 (4.1%) to \$52 (4.9%) for the Mosholu Site and the Eastview Site with NCA Pressurization, respectively, for 2016. These potential water rate increases would not result in significant impacts by causing indirect displacement of low-income residents.

The implementation of the WTP project at any of the sites would not result in a substantial burden on in-City water users. The annual increase in the water rate charge to the in-City user for the Mosholu Site in the years 2011 and 2016 would be \$28 (3.3%) and \$44 (4.1%), respectively, above the base rate if the Croton WTP were not built. This compares to an annual increase in the water rate charge to the in-City user for the Eastview Site with the Kensico City Tunnel (KCT) in the years 2010 and 2016 of \$38 (4.7%) and \$45 (4.2%), respectively, if an inflator factor of 4% is applied to property tax liability, which was the inflator factor utilized in the Draft SEIS. However, given the trend in property tax increases in Westchester County, New York State, and the surrounding region, it is reasonable to consider the higher property tax inflation factor in calculating the water rate impact of the project if sited at the Eastview Site. Therefore, water rates impacts utilizing a 5% and 6% inflation rates were calculated. These calculations show that water rates using the 5% inflator would be \$38 (4.7%) and \$47 (4.4%), in 2010 and 2016, respectively. The reason that the 2010 rates remain the same with the different inflation rates is that the property tax increases would not take affect until 2011.

The Eastview Site with the NCA Pressurization, without an assumed \$28 million for local community amenities, would result in an annual increase in water rate charges to the in-City user in the years 2010 and 2016 of \$38 (4.7%) and \$52 (4.9%), respectively. The Eastview Site with

the NCA Pressurization was not analyzed including the amenities package because that scenario already includes substantial costs related to the pressurization of the Aqueduct and building the treated water tunnel to the Aqueduct.

The Harlem River Site would result in an annual increase in water rate charges to the in-City user in the years 2011 and 2016 of \$34 (4.0%) and \$46 (4.3%), respectively.

It is important to note that the Mosholu Site would result in the lowest increase in annual water rate charges to the in-City user in the analyzed years.

1.5.2.1.7. Traffic

Though significant traffic impacts during construction would occur at all three of the WTP sites, the level of impact differs between the sites. If the WTP were to be located at the Eastview Site, construction of the project would result in the most widespread traffic impacts of any of the sites. This results from the large number of worker and construction related vehicles that would be accessing the site, especially when the Cat/Del UV Facility is assumed to be co-located at the site. Additionally, the site is 1.7 miles away from the nearest major highway. Since the site is far from the nearest major highway, a greater number of impacts at intersections between the site and the highway would occur as a result of the construction traffic traveling through the area between the site and the highway. As a result of construction of the WTP at the Eastview Site, 5 intersections would be significantly impacted, with a total of 12 significant impacts during the AM and PM peak hours, this assumes the Cat/Del UV Facility is not co-located at the site. If the Cat/Del UV Facility impacted, with a total of 33 significant impacts during the AM and PM peak hours. During operation of the proposed WTP, significant impacts at a several intersections in the vicinity of the Eastview Site would remain.

Construction of the WTP at the Mosholu Site would result in significant construction-related traffic impacts as a result of the project. However, these impacts would be confined to the immediate vicinity of the golf course between the site and the West 233rd Street exit of the Major Deegan Expressway. These are all mitigated by geometric as well as signal timing changes at the affected intersections. Unlike the Eastview Site, the Mosholu Site is near a major traffic corridor, the Major Deegan Expressway, therefore, the number of intersections that could be affected by the project at the Mosholu Site is substantially lower than at the Eastview Site, where many more possible routes/intersections are between the site and major traffic corridors. In addition, as part of the project at the Mosholu Site, restrictions will be placed on construction truck traffic requiring that trucks access the site from the West 233rd Street exit of the Major Deegan and proceeding south along Jerome Avenue and leave the site going north along Jerome Avenue. This restriction will prevent the potential for adverse impacts to the community to the south of the site and would route truck traffic past uses that would not be sensitive to truck traffic. Additionally, there would be no significant traffic impacts at the Mosholu Site during the operation of the WTP.

If the WTP were to be built at the Harlem River Site, construction-related traffic impacts would occur in the vicinity of the site as a result of the project. Although the site is very close to the Major Deegan Expressway, the nearest major traffic corridor, and construction related truck

traffic going to the site would have to be restricted to 29 trucks per day and workers would not be permitted to park on-site, multiple traffic impacts would occur since the existing road network is already heavily congested and experiences substantial delays. The addition of the project related traffic would exacerbate the existing delays, resulting in significant adverse unmitigatable impacts within the network. In addition, unlike the Mosholu Site, without rebuilding the entire interchange between West Fordham Road and the Major Deegan Expressway it is unlikely that measures can be taken to alleviate either the existing congestion in the area or lessen the impact of the project on the network.

In conclusion, the introduction of the WTP at the Mosholu Site would have the least impact on the existing road network surrounding the site as a result of the project, especially given the measures being implemented as part of the project to restrict truck traffic through the neighborhood. Construction at the Eastview Site would result in widespread impacts, particularly along the Route 9A Corridor where trucks would need to travel along several miles of roadways bordering commercial and retail strips serving the adjacent communities. Construction of the WTP at the Harlem River Site would worsen an already severely congested network, even with the measures being taken as part of the project.

1.5.2.1.8. Noise

The only site that would have significant adverse construction-related noise impacts would be the Mosholu Site, which are anticipated to occur within the golf course, the Saturn Playground, and a limited number of residences near the site. However all but the impact to the golf course would be fully mitigated as part of the project with the use of noise control measures such as noise barriers or other attenuation measures. The impact within the golf course, which is anticipated to occur in close proximity to the site where park users would continue to have public access, would remain but would be intermittent throughout construction and would be reduced with the implementation of noise attenuation measures. The implementation of these measures would reduce the effect of construction noise on sensitive receptors in the vicinity of the site. With the implementation of these measures, the public would not experience excessive noise levels as a result of the project. The Eastview and the Harlem River Sites would have shortterm temporary adverse impacts as a result of construction. However since there would be no sensitive receptors in close proximity to the construction zone, no potential for significant adverse impacts are expected, because the noise related impacts would either only affect nonsensitive receptors in the vicinity of the site or would be short-term. No noise reduction measures are proposed to be implemented as part of the project at these sites.

1.5.2.1.9. Hazardous Materials

The Harlem River Site is the only site with extensive contaminated material on site that would have to be remediated or removed prior to the start of construction. The site is extensively contaminated with several heavy metals, volatile organic carbons, semi-volatile organic carbons, and PCBs as a result of off site contaminate migration as well as on site contamination from industrial uses, such as electric transformer storage, cement batching, and a lumberyard. The groundwater contains MBTE and naphthalene, and there are also contaminants in the river sediments that would be disturbed by any action at this site.

The Mosholu Site has minor contamination in the vicinity of the golf course maintenance sheds, and the existing club house contains asbestos and lead paint, which would have to be disposed of in accordance with all applicable regulations. It is not anticipated that remediating/disposing of the contaminated material at the Mosholu Site would add substantial delay to the start of construction.

The Eastview Site has been owned by New York City since the 1910s and has not been developed. Therefore, there is a low probability of contamination being on site. As part of the project, at this site as well as the others, a Health and Safety Plan would be instituted to protect workers during construction.

In conclusion, the Eastview Site is the least likely to exhibit hazardous materials contamination. Although there is some hazardous material to remove from the Mosholu Site, appropriate precautionary measures and health and safety plans implemented as part of the project will prevent the general public and construction workers from being exposed to contamination from such materials.

1.5.2.1.10. Natural Resources

Implementation of the project at all three of the WTP sites would pose significant impacts to natural resources. Each of the sites poses a different type of natural resources impact.

Building the WTP at the Mosholu Site would result in the removal of 370 trees and the threatening of 245 trees, as well as possibly reducing the groundwater flow into a wetland adjacent to the construction area. Trees of this nature and associated vegetation in a preserved park environment are rare in New York City; therefore their loss would represent a potential significant adverse impact. It should be noted, however, that the majority of the trees that would either be removed or threatened are trees within the Mosholu Golf Course along fairways and do not represent a component of a valuable natural habitat. The removal of these trees would not substantially harm the natural habitat and contiguous forests within the Van Cortlandt Park. Only 0.7 acres of the contiguous forest adjacent to the construction site would be removed as a result of the project, and a portion of that area is being removed in order to build a temporary golf course parking lot to enable to the golf course to remain in play throughout the construction of the proposed project. 76 of the trees proposed to be removed and 79 of the threatened trees would be a consequence of the temporary Golf Course facilities and parking lot. 72 of the cut trees are within the fairways of the Golf Course and within the driving range. The remaining trees are in small woodlots that are adjacent to the driving range and fairways.

There are wetlands adjacent to the Mosholu Site that could be adversely impacted. This potential impact will be avoided by the construction of infiltration structures adjacent to the nearby forested wetland to replenish groundwater and maintain the existing hydrology.

Building the WTP at the Eastview Site would result in 494 trees being cut and 214 being threatened. In addition to the trees and vegetation being lost, approximately 0.2 acres of freshwater wetlands would be lost. This lose includes the permanent lose of an approximately 0.1 acre isolated wetland in the northwest portion of the site and the temporary loss of approximately 0.1 acres of wetland during the construction of the conduit connecting the WTP to

the Delaware Shaft No. 19. It should be noted that a majority of the vegetation to be removed from the site by the project would be multiflora rose, an invasive species, which does not provide valuable habitat for the region. In addition, a majority of the trees that would be removed as a result of the project are not part of the most valuable forest system within the site, but are spread throughout the multiflora rose field in the northwestern portion of the site.

Building the WTP at the Harlem River Site would result in the removal of 101 trees and the filling of approximately 1.5 acres of tidal wetlands. As a result of the project, all of the existing vegetation on the site would be removed. However, the existing vegetation consists of disturbed trees, shrubs, and herbs without any coherent habitat system since a majority of the site is covered by paved and cleared areas interspersed with vegetation. Therefore, the existing vegetation on site provides little habitat value for foraging or as a breeding location for mammals and birds. On the other hand, the loss of the approximately 1.5 acres of tidal wetlands would result in a negative impact to the marine community currently utilizing the area. However, as part of the project, three acres of tidal wetlands would be created, 1.8 on site and 1.2 off site. Therefore, overall, the implementation of the proposed project would result in an improvement to the marine habitat available to species that currently utilize the shoreline along the project site.

In conclusion, building the proposed WTP at the Mosholu Site would result in the least overall natural resources impact as a result of the project. The vegetation being removed, including 350 trees, is largely confined to the removal of vegetation along fairways within the golf course, which provide little habitat value, whereas building the WTP at the Eastview Site would result in the removal of 494 trees, also within an area of little habitat value, but with a greater number of trees as well as 0.2 acres of wetland impacts, and building the WTP at the Harlem River Site, although only impacting 101 disturbed trees, would result in the filling of approximately 1.5 acres of tidal wetlands, which provide a valuable habitat for marine organisms.

1.5.2.1.11. Public Health

The main public health concerns related to the construction of the WTP is the generation of particulate matter (PM), specifically, fine particulate matter, such as $PM_{2.5}$, during construction. $PM_{2.5}$ in the atmosphere can lead to elevated occurrences of respiratory system health effects. In recognition of the community's concerns regarding increased truck traffic related to the proposed project, NYCDEP is committed to the use of ULSD or equivalent emission reduction measures in order to reduce the emissions of $PM_{2.5}$ during construction of the WTP both for on site off-road vehicles as well as on-road trucks utilized by the contractor for hauling excavated material from the site. In addition to the use of ULSD the BAT will be implemented during both the construction as well as the operation of the WTP. The predicted particulate matter concentrations would not result in significant adverse impacts during either construction or operation of the proposed WTP. Therefore, no significant adverse impacts to the public health of the residential or commercial communities in the vicinity of the preferred Mosholu Site or the alternative Eastview or Harlem River Sites are anticipated.

In addition, for the WTP sites within NYC, as well as the Jerome Park Reservoir, a rodent control program will be implemented to prevent the displacement or attraction of vermin during the construction of the WTP and related facilities.

1.5.2.2. Engineering / Construction

One of the most compelling engineering benefits of the Mosholu Site is its proximity to the raw water supply and the distribution system connections. Tunnel routes are shorter than at the other sites. A raw water basin at Jerome Park Reservoir could be utilized to control flow to the plant. Interconnection with the Cat/Del System provides the ability to respond quickly to emergencies and to fluctuations in demand. Another key factor is that an in-City site for the WTP it allows the New Croton Aqueduct to remain in service as a raw water conduit to the City without the necessity for major improvements to eliminate infiltration into the Aqueduct. Keeping this conduit in service provides a valuable alternative path for water to flow to the City, and is therefore an important security consideration for the overall water supply system. These features enable the City to maintain the desired flexibility and redundancy in the water supply system.

Structural and HVAC engineering at the Mosholu Site are complicated by the buried plant being underground. However, the excavation into solid bedrock assures an excellent foundation, minimizing differential settlement. The additional security provided by the buried structure (security that could not be engineered into an above-grade structure) is a positive aspect of this site.

Construction of the WTP at the Mosholu Site would require the excavation of over 1,000,000 cy of material, mostly rock, from the building footprint before construction of the facility could begin. Access to and from the site is restricted to the one existing access point, the intersection of the site road and Jerome Avenue.

Access for equipment around the perimeter of the excavation is somewhat limited due to the construction boundary designed to keep the golf course in operation. Tunnel excavation would further hamper access around the site, but the shorter tunnel lengths associated with this site are advantageous.

The Eastview Site offers the benefit of the most straight-forward engineering of the above-grade WTP structure. The building is expected to be constructed without any unusual complications. However, the additional length of the raw water tunnel, the deep pumping station, and the necessary surge/overflow protection within the New Croton Aqueduct, the connection tunnel, and at the WTP, create engineering and construction complexities. The presence of fractured rock beneath the site necessitates deeper tunnels and complicates the design of the raw water pump station. A temporary connection to Shaft 19 of the Delaware Aqueduct must be made without interfering with the operation of the water distribution system. During this period, the City would be mixing waters and would have eliminated much of the redundancy and flexibility of the existing water distribution infrastructure due to the present separation of the Croton System from the Catskill/Delaware Systems outside of New York City.

Construction of the raw and treated water connections to the Eastview Site would also present many challenges. A mile and a half long tunnel excavation would be constructed from the site, reducing the space available for building construction. A pumping station would be constructed underground, a more difficult and complex activity than construction of the WTP. In addition, construction of the Croton WTP at Eastview would require coordination with the construction of the UV Facility. The simultaneous construction of the two projects would result in 40,000 additional truck trips above the traffic of the two projects independently, due to the reduction of available stockpile area. This truck traffic, as well as construction worker traffic, would pass through commercial and residential areas in order to access the site. Operating a WTP at the Eastview Site also requires either pressurization of the NCA at a cost of \$558 million or a connection to the KCT as a long-term treated water conveyance solution. Selection of the KCT as the long-term treated water conveyance carries the risk that issues related to tunnel routing would create delays in the construction and operation of that tunnel, leaving the temporary conveyance from the WTP in service beyond the planned duration.

The Harlem River Site offers many of the same advantages in terms of water supply system operation as the Mosholu Site. The raw and treated water tunnels, although longer (~10,000 Linear Feet), than those associated with the Mosholu Site, operate in much the same way. Jerome Park Reservoir would be utilized as a raw water basin and provide a measure of flow control, and treated water could be transferred to the existing distribution system connections, maintaining the desired system flexibility and redundancy. However, tunnels to/from the site would encounter a mixed face-soil and rock-complicating tunnel design and construction. The Harlem River Site would permit the NCA to remain a raw water conduit to the City, without the necessity for major costly improvements.

Subsurface conditions, requiring soil compaction, complicate foundation design and construction. Stabilizing a waterfront site, along with providing pedestrian access to the waterfront while maintaining site security, create engineering and construction challenges not easily overcome.

Construction at the Harlem River Site would be difficult because the site is only 350 feet wide at its widest point, with the Metro-North tracks to the east and the Harlem River to the west. Vehicular access to the site would be limited due to the anticipated congestion generated by a project of this magnitude at a site accessible only from the University Heights Bridge. Transport of bulk materials and some construction staging would occur from barges in the Harlem River, arriving at docking facilities that would be constructed at the outset of the project.

WTP construction would be complicated by the lack of access to all sides of the structure, limiting the staging area and restricting delivery options. Another concern is the coordination of the bulkhead construction, WTP excavation and backfill, pile driving, raw and treated water pipeline installation, soil compaction and concrete foundation work required to be completed before the superstructure can be built. Tunnel work would be staged at the north end of the property, further complicating the access problems. The tunnel would pass under the Major Deegan Expressway, necessitating underpinning of the highway. As noted above, the mixed face tunneling would be difficult for the tunnel contractor, requiring different construction methods for each section. These circumstances could only add to the construction risk.

Each site has advantages and disadvantages in terms of engineering and construction. The engineering and constructability issues at Harlem River make it a less attractive site than Mosholu, with which it shares water supply system advantages. Eastview would be the easiest

site to construct the WTP structure, while sacrificing system flexibility and redundancy, and increasing the length and therefore the uncertainty of the tunneling.

1.5.2.3. Operation / Water Quality

Taken as a whole, the Mosholu Site provides the most overall benefit to the City in both operational ease as well as water quality benefits than do the other two sites. The Mosholu Site is close to the distribution system so the probability that treated water from the plant could be contaminated is low. Furthermore, building at the Mosholu Site would require one dose of chlorine to treat the water. At the Eastview Site, there is a greater potential for contamination given the greater distance between the WTP and the distribution system. Additionally, two doses of chlorine would be required to treat water from Eastview prior to entering the distribution system because of the distance between the WTP and the distribution system, which could result in higher levels of Disinfection By-Products (DBP) than would occur if the WTP were at the Mosholu Site.

Jerome Park Reservoir (JPR) would remain in service as a raw water reservoir and act as a balancing reservoir to meet the fluctuating water supply needs of the City. If the WTP were at the Eastview Site, the Croton Lake Gate House (CLGH) would need to constantly adjust flow in the NCA to meet the City's demand because the New Croton Reservoir would be the final raw water reservoir before water reaches the WTP at the Eastview Site. The Harlem River Site would be similar to the Mosholu Site in terms of the advantages mentioned above. However, the WTP at the Harlem River Site would require more pumping than the Mosholu Site. The WTP at the Harlem River Site would require treated water pumping to lift water to a pressure of 305 feet to supply the higher elevations in the service area at connections near Jerome Park Reservoir and to a pressure of 130 feet to a connection with the NCA to provide water to Manhattan users. The WTP at the Eastview Site would require raw water pumping to lift water greater than 100 ft from the bottom of the raw water shaft to the plant inlet. And finally, the WTP at Mosholu would require raw water pumping to lift water pumping to the high-level service. Therefore, it is likely that the Mosholu Site would have the lowest energy cost related to pumping since it has to lift water the shortest distance.

The Eastview Site long-term treated water conveyance alternatives provide the City with a choice of keeping the redundancy that is currently built into the system by maintaining separation of the Croton and the Cat/Del Systems until the water reaches the distribution system (through use of the NCA), or eliminating the need to upgrade the NCA and providing a means for having all City water being conveyed through the Cat/Del Systems (through the KCT). Both the Mosholu Site as well as the Harlem River Site would provide redundancy in the System by keeping delivery of Croton water to the City separate from the Cat/Del water, although mixing of waters from both Systems would occur within the City's water distribution system. This redundancy would enable water to still be supplied to users even if something were to occur to either the Croton or the Cat/Del Systems. Moreover, the separation of the systems permits water to be delivered to both the high-level as well as the low-level service areas. Both the Mosholu and the Harlem River Sites would provide a connection to the high-level service (the Cat/Del System) as well as the low-level service (the Croton System). Additionally, both the Mosholu and Harlem River Sites have direct connections to the distribution system and do not rely on other possible work to convey treated water to the distribution system.

redundancy and flexibility to the System both the Mosholu and Harlem River Sites have an advantage over the Eastview Site since both can provide treated Croton water to both the high-level as well as the low-level service areas, they both keep the Croton and the Cat/Del Systems separated until after they reach the City, and they do not rely on large infrastructure changes in order to deliver treated water. The work related to either the pressurization of the NCA or the construction of the KCT could be delayed because of budget constraints, shaft siting, or engineering difficulty.

1.5.2.4. Social

The Mosholu Site would provide the most social benefit as a result of building the proposed WTP. If the WTP were built at the Mosholu Site \$200 million would be invested in Bronx parks and recreational facilities. This investment would greatly improve the existing open space and recreational facilities in the borough. If either of the other two sites were chosen for the WTP, this investment would not occur. Although construction of the WTP at the Mosholu Site would result in the permanent loss of two acres now available for public open space and recreation, the vast majority of the site will, upon completion of the project, be available for such uses. If the WTP were built at the Harlem River Site, the area might (depending upon security requirements) be improved with a waterfront esplanade and publicly accessible open space in addition to the WTP, yielding some social benefits. If the WTP were built at the Eastview Site, the Town of Mount Pleasant would be likely require certain social improvements in order to obtain local site approval. If the Eastview Site were selected, no amenities would be provided within New York City since the plant would not be within the City.

1.5.2.5. Approvals / Permits

The Mosholu Site requires the fewest approvals from permitting agencies or land use approval entities. ULURP approval has already been obtained for the proposed project at the Mosholu Site. The ULURP approval, granted by the City Council on July 21, 1999, approved the selection of the site for construction of a WTP within the Mosholu Golf Course. The proposed project, with its reduced footprint, would be built within the area previously approved for the siting of the WTP. As part of that approval and as part of the FEIS issued in 1999, NYCDEP is required to rebuild the driving range atop the WTP; to provide reforestation within Van Cortlandt Park to mitigate the impact associated with removing vegetation within the Park to build the proposed facility; to renovate both the Shandler Recreation Area and the Saturn Playground; to upgrade and improve the Old Croton Aqueduct Trail; to install signage within Van Cortlandt Park; to renovate the entrance way area west of Dickensen Avenue, near Van Cortlandt Park South; to complete restoration of the area adjacent to the Van Cortlandt Valve Chamber; to evaluate the feasibility of building a bridge over the Major Deegan Expressway to connect the east and west portions of Van Cortlandt Park; and to create a Facilities Monitoring Committee (FMC). The reforestation program could include the hiring of Urban Park Rangers and restoration of areas within the Park during the first phase of construction.

In addition to the previously issued ULURP approval, legislation authorizing the alienation of parkland is necessary to permit the construction and operation of the proposed WTP at the Mosholu Site. Legislation approving the alienation of parkland necessary for the construction, operation and maintenance of the proposed WTP was signed into law on July 22, 2003. Pursuant

to the alienation legislation the City is authorized to discontinue the usage of the Mosholu Site as parkland, for the purpose of constructing, operating and maintaining the WTP. The authorization is subject to certain conditions, including the completion of a Supplemental Environmental Impact Statement (SEIS); the City acquiring additional parkland and/or making capital improvements to parklands or recreation facilities in an amount equal to or greater than the fair market value of lands being alienated; the City entering into a Memorandum of Understanding (MOU) with the President Pro Tempore of the State Senate and the Speaker of the State Assembly, identifying the sum of money to be dedicated by the City towards implementing eligible projects to acquire and/or improve parklands in the Borough of the Bronx; and the City is to give due consideration to dedicating JPR as parkland. As of the date of this Final SEIS: the City has committed to spending \$200 million on projects to acquire parkland and/or improve park lands and recreational facilities in the Bronx; the City will shortly enter into the required MOU, memorializing this commitment.

If the WTP were located at the Eastview Site, approval would be required from the Town of Mount Pleasant Town Board for site plan approval. There is no stated limit on how long the Town Board can take in their review of projects. If the proposed Croton WTP were to be sited at the Eastview Site, the approval process would be complicated by the proposed siting of the Cat/Del UV Facility, which is currently awaiting approved at the same site. Therefore, if the WTP were located at the Eastview Site, delays could occur in the implementation of the project as a result of the local site approval process. Additionally, easements/condemnation of tunnel rights-of-way would be needed to connect the NCA to the site.

If the WTP were located at the Harlem River Site, local site approval would also be required. The Uniform Land Use Review Procedure (ULURP) process would have to be completed. This process involves a 9-month review process including review by the Community Boards affected by the project, the Borough President, and the City Council. Additionally, easements/condemnation of tunnel rights-of-way are needed to connect JPR and the NCA to the site and acquisition/condemnation of various properties on site is required in order to build the WTP, including some properties whose owners possess their own condemnation powers.

Therefore, siting the WTP at the Mosholu Site would entail the least potential delay prior to the implementation of the project.

The Eastview and Harlem River Sites would require land use approval, which has already been secured for the Mosholu Site. The land use approval process could result in delays that could compromise the City's ability to comply with mandated timetable for the delivery of treated Croton water.

1.5.2.6. Security

The Mosholu Site represents the most secure of the three proposed WTP sites. In addition to being below ground, and therefore the least exposed, locating the WTP at the Mosholu Site, as with the Harlem River Site, keeps critical facilities associated with the City's water supply system separated, therefore providing redundancy in the System. Whereas building at the Eastview Site would concentrate critical water infrastructure at one location, potentially posing a risk to the entire system if there were ever an attack on the facilities at the site.

The Harlem River Site is the least secure of the three sites. The site would be difficult to secure since the Harlem River, the Metro-North railroad tracks, and the Major Deegan Expressway all pass right by the site. These transportation corridors could provide platforms from which attacks on the facility could be launched.

1.5.2.7. Economics

The Mosholu Site, overall, provides the most economic benefit of the three sites. The Mosholu Site has the lowest life cycle costs of the three sites at \$1,352 million and the lowest annual operating costs at \$22 million. While the Harlem River Site has the lowest capital cost of \$1,215 million, but a higher life cycle cost, \$1,378 million, than does the Mosholu Site because its operating costs are \$25 million per year. The Eastview Site has the highest costs of the three sites with capital costs of \$1,247 million and \$1,597, and total life cycle costs of \$1,521 and \$1,814, with the KCT or the NCA Pressurization, respectively.

In addition, included in the costs of the Mosholu Site is a \$200 million investment package to improve parks and recreational facilities in the Bronx. This extra expense, which is attached to the Croton WTP project only if the project is located at the Mosholu Site, could provide improved economic conditions within the Bronx as the projects are constructed as well as upon completion. The implementation of the improvements would provide jobs during construction as well as possibly revitalize areas near the project site as a result of the improvements to Van Cortlandt Park.

Also, another advantage of the in-City WTP sites is that the City would not have to pay property taxes or Payments in Lieu of Taxes (PILOT) unlike at the Eastview Site where Town, County and school taxes would be payable and would be subject to increases over time. Although, locating the WTP at the Harlem River Site would deprive the City of property tax revenue from existing uses on the site since City facilities do not pay taxes, the existing uses can (and presumably will) relocate to other sites within the City and continue to contribute to the tax rolls.

A final economic advantage that the in-City WTP sites have is that construction worker jobs associated with the project would remain within the City; therefore, the City would receive income tax revenue from the project.

1.5.2.8. Conclusion

After careful consideration of all of the above factors, it is clear that the Mosholu Golf Course Site is the best site for the Croton WTP.

Construction of the WTP at any of the three sites under consideration would result in environmental impacts, including traffic and natural resource impacts. At the Mosholu Site, impacts would largely be confined to the area immediately surrounding the construction site, primarily the adjacent golf course. NYCDEP is committed to taking appropriate mitigation measures that will reduce these impacts and maintain quality of life, wherever the project is sited. At Mosholu, these efforts will include steps to keep the golf course open even while the project proceeds, thus maintaining an important public recreational resource.
Since each of the sites presents potential environmental impacts, and each will involve appropriate measures by NYCDEP that are expected to mitigate those impacts, environmental impacts alone cannot form the basis for selecting a preferred site.

However, when consideration is given to a number of other, equally important factors, the Mosholu Golf Course site is clearly the site that offers the greatest benefits to the City. Among other things, the Mosholu Golf Course Site is the most secure; it maintains the redundancy already built into the City water supply by keeping the Croton and Cat/Del systems separate; it is the least costly site; it does not require further land use approvals; it involves the least risk in terms of tunneling; it would keep construction jobs within the City; and it would result in a \$200 million investment in Bronx parks and recreational facilities, as well as certain capital improvements within Van Cortlandt Park that were already required by the ULURP approval granted in 1999 (e.g., construction of a new driving range, and new golf course club house and parking area). Although approximately 43 acres of parkland would be alienated in order to allow for construction, operation and maintenance of the Croton WTP and related facilities, the Mosholu Golf Course would remain open during construction, and virtually all of the alienated land, except for approximately two acres adjacent to the WTP, would be available for open space or recreational use after the WTP is completed and is operational.

	Eastview NCA ¹	Eastview KCT ²	Mosholu ³	Harlem River
Approximate dimensions – main building	1,000t. X 267 ft	1,000. X 267 ft	555 ft X 685 ft	920 ft X 260 ft.
Approximate dimensions- Other buildings	51 ft. X 44 ft.	51 ft. X 44 ft.	60 ft X 75 ft 60 ft. X 60 ft.	320 ft. X 180 ft.
Approximate building footprint area	262,000 sq. ft	262,000 sq. ft	380,000 sq. ft	272,000 sq ft
Maximum main building height above grade	65 ft	65 ft	Main building at grade - 0 ft. Others ~ 30 ft.	Penthouse – 76.5 ft. Roof – 65 ft.
Length of Raw Water Tunnel	7,500 ft	7,500 ft	900 ft	1,415 ft
Length of Treated Water Tunnel	7,500 ft 1,950 ft.	1,950 ft.	3,680 ft combined 0 High Level 650 Low Level	350 ft combined 6,640 High Level 1,200 Low Level
Approximate area affected during construction	30 acres	30 acres	28 acres	17.5 acres
Approximate finished WTP site area (buildings and roads)	12 acres	12 acres	11 acres	11 acres
Construction Costs, 2003 ⁴ \$ million	\$1,546	\$1,196	\$992	1,174
Estimated Mitigation/Attenuation 2003 \$ million	\$23	\$23	\$43	\$11
Amenities 2003 \$ million	\$28	\$28	\$200	\$30
Total Capital Costs 2003 \$million	\$1,597	\$1,247	\$1,235	\$1,215
Annual Operating Costs, 2003 \$million	\$33	\$33	\$22	\$25
Life Cycle Costs, 2003 \$million	\$1,814	\$1,521	\$1,352	\$1,378

TABLE 1. SITE COMPARISON FOR THE CROTON WATER TREATMENT PLANT

TABLE 1. SITE COMPARISON FOR THE CROTON WATER TREATMENT PLANT

Notes:

¹ NCA as the finished water conveyance. Includes \$558,000,000 cost of aqueduct pressurization plus \$125,000,000 for the Treated Water Tunnel.

² Kensico-City Tunnel. This is a proposed new City Water Tunnel to connect Kensico Reservoir, the Eastview Site, and the Van Cortlandt Valve Chamber. The New Croton Aqueduct would only be used for plant overflows.

³ The Mosholu Design requires a passageway around the perimeter of the underground WTP to move equipment that is accomplished at the other sites by an exterior roadway.

⁴ Costs are based on 2.75% inflation, 6.4% interest, and 30-year life cycle. All costs are from Conceptual Designs. Estimates of amenities and mitigation costs are included. Baseline NCA rehabilitation is not included.

2. SUMMARY OF THE PROPOSED PROJECT

The largest potential impacts associated with the proposed project would be confined to the WTP sites. After a brief introduction to the WTP process that is common to all sites, the following section provides a summary of the proposed work at each of the three sites. The tunnels and connections associated with each site are also included with each WTP site description.

In order to expedite inspection and rehabilitation of the NCA, the Baseline Rehabilitation project for the NCA would be completed before the start of the WTP construction and would be evaluated through a separate environmental impact analysis since the expedited inspection and rehabilitation of the NCA needs to occur irregardless of a decision about the siting of the Croton WTP. This includes seasonal work in 2004-2006 at most of the accessible shafts along the NCA. The work at shaft sites specifically related to the construction of the WTP is described in this Final SEIS. Most of this extra work along the NCA would only occur if the Eastview Site is selected and the NCA is chosen as the preferred treated water conveyance. Extensive work at Gate House No. 1 is required with the selection of the Mosholu Site. That work is described in the Off-Site Facilities – NCA Pressurization section. All the sites require some work at Jerome Park Reservoir, and the proposed work at this site is described in the Off-Site Facilities – Jerome Park Reservoir section after the description of the three WTP site alternatives.

2.1. WATER TREATMENT PROCESS

The water treatment process design is very similar for the three project designs. The only significant difference, as described in the Final SEIS, is that the solids (residuals) would be removed on site if the Eastview Site were selected but the solids would be pumped to the Hunts Point WPCP if the WTP were to be built at either the Mosholu or Harlem River Sites.

The primary goals of the proposed project are to meet the public water supply and public health needs of the City and to comply with State and Federal drinking water standards and regulations. The key treated water quality objectives considered in evaluating and selecting a treatment process for the Croton System focus on source water quality and current and anticipated water quality regulations. These water quality objectives include:

- **Filtration**, for concerns over *Giardia* cysts (Giardia) and *Cryptosporidium* oocysts (Cryptosporidium), making the optimization of turbidity and particle removal critical;
- Aesthetics, improving aesthetic parameters such as color, taste and odor, iron and manganese, and visible larvae, due to consumer complaints;
- **Disinfection**, compliance with the disinfectant concentration and contact time (CT) requirements of the Surface Water Treatment Rule (SWTR) and the future Enhanced Surface Water Treatment Rule (ESWTR) to balance against lower trihalomethane (THM) and other disinfection by-product (DBP) standards that have been proposed under the future Disinfectant/Disinfection By-Products Rule (D/DBPR); and
- **Disinfection By-Products**, future standards of 64 ug/l for Total Trihalomethanes and 48 ug/l for the total of five Haloacetic Acids (HAA5) (on a locational running annual average basis at the worst case points in the distribution system) have been identified.

To satisfy the above-mentioned criteria, the selected treatment process for the proposed plant would be a "stacked" dissolved air flotation/filtration (DAF/Filtration) system. This proposed 290 mgd plant would include coagulation/mixing, flocculation, dissolved air flotation (DAF), filtration, and UV disinfection. This selection would achieve treated water quality goals including a 99.9 percent (3-log) removal/inactivation of *Giardia* and 99.9-percent (3-log) removal of *Cryptosporidium*.

In an achievable dose, UV disinfection has been found to effectively prevent the *Cryptosporidium* from replicating itself and is therefore shed from a host's digestive tract without causing illness. UV disinfection has also been found to render *Giardia lamblia* non-infective, but was deemed inefficient with respect to inactivating viruses. To inactivate many microorganisms (bacteria, viruses, and *Giardia lamblia*), chlorination is effective, but it is not effective for inactivating *Cryptosporidium parvum*. In the USEPA's published September 2000 Agreement-in-Principle and subsequently was adopted in the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) that was published on August 11, 2003 in the Federal Register (Volume 68, Number 154), chlorination is given no credit for *Cryptosporidium* inactivation. UV technology, on the other hand, has been approved in the Agreement-in-Principle for use against *Cryptosporidium*. Based on its approval by the USEPA for the inactivation of *Cryptosporidium*, UV has been selected for the proposed plant.

Ancillary systems in the proposed plant would include pre/post-treatment chemical storage and handling, process waste backwash water handling and residual facilities, with necessary support facilities such as: electrical; instrumentation; plumbing; security; and heating, ventilation and air conditioning systems. Figure 4 outlines the arrangement of proposed facilities at the proposed plant.

The proposed plant at any of the sites would include the water treatment building (housing the treatment processes, administrative offices, and a process laboratory), an electrical substation, a raw water tunnel from the NCA, treated water conveyances, and pumping or turbine station as required for each site.

The proposed plant layout would be designed to minimize space requirements. This design practice involves using appropriate loading rates in the treatment processes, common wall construction with rectangular treatment units and vertically stacking some process components. The structural components would be designed in accordance with state and local codes to accommodate normal and seismic forces. The proposed plant design would incorporate levels of redundancy based on good engineering practices and regulatory requirements (*Recommended Standards for Water Works*, which is also referred to as the *Ten State Standards*). Although these design levels of redundancy are not considered mandatory, they would be used in the process design and by the NYSDOH as a guideline for approval of the proposed project. Therefore, the proposed project would incorporate an "n+1+1" redundancy for the critical equipment design.



Water Treatment Plant Process Block Diagram

Croton Water Treatment Plant

The proposed plant would be designed such that the main flow of water through the treatment processes would be by gravity. The average design flow would be 144 mgd with a maximum capacity of 290 mgd. With the design principle that no single plant component would treat, convey, or power more than 50 percent of the plant design flow, in the event of an unforeseen shutdown or emergency, the main treatment processes would be divided into two separate water treatment trains (Train A and Train B). Further subdivision, yet parallel process units, would appear in the plant design.

The treatment processes (i.e. rapid mixing, flocculation, DAF, filtration, and UV) would be connected in the proposed plant by means of channels, conduits, and pipelines. Electrically operated sluice gates and valves would control and regulate flows through the proposed plant. In the event of a power or mechanical failure, these gates and valves may fail to operate. Provisions to handle these process overflows would be required to assure that tank levels could not rise above the elevation of the operating floor and flood the proposed plant.

Two process overflows would also be provided, one for each half of the plant. These overflows include the combined contribution from the backwash tanks, the waste backwash water tanks, and the filter-to-waste tanks.

Treatment of Croton water would result in the production of residuals throughout the treatment process. The proposed plant residual handling facility would serve the following purposes:

- Collection and recycling of waste backwash water and filter-to-waste water from periodic cleaning of the DAF tanks and filters (e.g., backwashing),
- Collection of the floated solids from the DAF tanks, and
- Transferring floated solids off-site for dewatering and disposal.

Solids would be handled differently at the sites in the Bronx as compared to the site in Westchester County if the Eastview Site were selected. At the Eastview Site, the waste streams would be dewatered via centrifugation. The water would return to the head of the WTP and the solids would be conveyed to the sewer for ultimate dewatering at the Westchester County WPCP in Yonkers. At the Mosholu and Harlem River Sites the wastewater would be conveyed to the Hunts Point WPCP in the Bronx via a new force main constructed beneath streets. This WPCP has adequate capacity to handle the solids from the Croton WTP without additional construction or staffing. The conveyance to Hunts Point would be via a 6-inch force main in City streets.

2.1.1. Treatment Chemicals

Chemical facilities would be designed in accordance with NYSDOH and New York State Department of Environmental Conservation (NYSDEC) requirements. Regulatory requirements encompass chemical storage capacity, redundant transfer and feed pumps, and secondary containment of chemicals to protect against potential spills. The chemicals and their functions are listed below. Chemical application points, average and maximum dosage, and chemical storage volumes per treatment train (with two treatment trains in the proposed plant) are presented in Table 2.

- Potassium permanganate: Intermittent use for manganese control if the filter medium is changed in the future.
- Sulfuric acid: For pH correction prior to coagulation.
- Coagulant alum (Aluminum sulfate)/ PACl (Poly-Aluminum chloride): For coagulation.
- Coagulant Aid Polymer: Coagulant.
- Filter Aid Polymer: Filtration aid.
- Sodium Hypochlorite:
 - Pre-Feed: Used for plant start-up and aids in maintaining an oxide coating on the filter media.
 - Post-Feed: Secondary and disinfection of viruses.
- Hydrofluorosilicic Acid: To prevent dental decay.
- Sodium Hydroxide: For pH adjustment.
- Corrosion Inhibitor (Orthophosphate or Phosphoric Acid): For corrosion control.

Chemical system capacities would be based on the chemical usage data from pilot testing and estimates of required dosages for other chemicals. The storage tank volume would be based on 30-day storage for the design usage, except sodium hypochlorite and potassium permanganate⁵, which would be based on 15-day storage. In order to standardize the design of the chemical systems, tanks would be provided for the larger of the 30-day storage or 5,000 gallons. However, the filter aid polymer and residual polymer would be shipped in totes rather than in tanker trucks.

Transfer pumps and transfer (day) tanks are proposed to reduce space requirements in the bulk storage tank area. Transfer tank volumes would be based on maximum flow and maximum dose conditions with a 24-hour detention time for all chemicals. All chemical storage tanks would be provided with secondary containment with the capacity to hold at least 110 percent of the largest single tank volume in the containment area. Incompatible chemicals would be stored in separate areas. The chemical system would be divided into two sub-systems, each serving one half of the treatment plant.

2.1.2. Electrical Power

Power usage at the maximum flow capacity of 290 mgd is estimated at 32.3 MW (34.4 MVA). At the daily average flow of 144 mgd, the power usage would be about 21.6 MW (23.0 MVA). During a power emergency when all Con Edison service feeders are out of service, plant operation would stop (0 mgd), and power usage from life safety and critical equipment would be about 1.31 MW (1.36 MVA). Two 1.5 MWA emergency diesel generators, one standby and one operating, would provide this power until Con Edison power was restored.

⁵ The currently planned filter medium, anthracite, can remove metals without oxidation by potassium permanganate, but if after operations are underway and it is decided to switch filter media to granular activated carbon, potassium permanganate would have to be added occasionally. The flocculation of iron and manganese with potassium permanganate is a slow reaction, and it would be added at the Croton Lake Gate House for a WTP at Eastview and at Gate House No. 5 for WTP sites in the Bronx. Work to install the potassium permanganate is entirely interior, of short duration, and would not result in any significant adverse impact.

	DOSI	E (mg/L)	DESIGN	USAGE ²	STO	RAGE ²	
Chemical	Average	Maximum	(Lbs/day) of active chemical	(Gal/day) of active chemical	No. Of Tanks	Volume per tank (gallon)	Application Point
Potassium Permanganate ³	3.0	3.0	7,256	N/A	15 cycle bins	3,300 lbs	Croton Lake Gate House (Eastview) or Gate House No. 5 (Mosholu or Harlem River)
Coagulant ⁴			I		7	9.284	
Aluminum Sulfate; Alum	17	30	10,640	1,998			First-Stage of Rapid Mixers
Poly- aluminum Chloride; PACl	13	17	8,136	2,464			First-Stage of Rapid Mixers
Sulfuric Acid	2.5	6.5	1,565	141	2	5,861	First-Stage of Rapid Mixers
Coagulant Aid (Cationic) Polymer	1.25	1.75	782	179	2	5,861	Second-Stage of Rapid Mixers
Filter Aid Polymer	0.05	0.2	31	8	Tote or S Drums	Storage	Second-Stage of Flocculation Tank
Sodium Hypochlori	te ⁵						
Pre-Feed	2.0	3.0	1,262	1,520	4	9,700	First-Stage of Rapid Mixers
Post-Feed	1.5	2.0	900	1,086			Filtered water discharge from UV reactors
Hydrofluorosilicic Acid	1.0	1.0	601	327	2	5,252	Filtered water discharge from UV reactors
Sodium Hydroxide	5.0	12.5	3,004	468	2	7,800	Filtered water discharge from UV reactors
Corrosion Inhibitor (Orthophosphate or Phosphoric Acid)	1.0	2.0	601	168	2	5,252	Filtered water discharge from UV reactors

TABLE 2. CHEMICAL SYSTEM DESIGN CRITERIA¹

TABLE 2. CHEMICAL SYSTEM DESIGN CRITERIA¹

Notes:

- (1) Quantities are per treatment train (with two treatment trains in the proposed plant).
- (2) Based on Average Dosage and Average Flow (144 mgd).
- (3) Potassium permanganate facilities would be at the Croton Lake Gate House for the Eastview Site and at Gate House No. 5 for the Mosholu and Harlem River Sites. It would be delivered in a dry chemical form and therefore gallons per day units are not applicable. Storage is based upon usage of 3,300 lbs cycle-bins a maximum flow and dosage. A cycle-bin system allows ease of storage, transport, and handling of potassium permanganate.
- (4) Coagulant storage tanks store either Alum or PACL at one time, depending on which chemical is more desirable to be used as a coagulant.
- (5) Sodium hypochlorite tanks store both pre-feed and post-feed sodium hypochlorite.

2.2. EASTVIEW WATER TREATMENT PLANT SITE

The City owns approximately 153 acres of largely undeveloped land located within Westchester County, New York, that is known as the Eastview Property. The Westchester County Grasslands Reservation borders the property to the north, east and northwest. Additional City-owned property is located to the south and southwest, with a residential development to the southeast along Taylor Road, and corporate office parks to the south and southeast. The property consists of 83⁶ acres situated in the Town of Mount Pleasant and 66 acres situated in the Town of Greenburgh. The two portions of the property are bisected by Grasslands Road/Route 100C, which serves as the border between the Towns. The proposed project would be situated on the 83-acre portion of the property within the Town of Mount Pleasant, which would be referred to as the Eastview Site for the remainder of this document.

The proposed project requires 12 acres of the Eastview Site for the permanent buildings and about 18 additional acres would be used for piping routes and temporarily for construction staging. This total of 30 acres is identified and delineated from approximately 83 acres of the City-owned property (Figure 5). The proposed project would primarily be an above-grade structure with a height of approximately 65 feet. There would also be a below-grade Raw Water Pumping Station (RWPS) adjacent to the proposed plant, a raw water tunnel from the NCA to the proposed plant, and a treated water conveyance system. A listing of the Croton water distribution system components related to the Eastview Site is included in Table 3.

The site is identified by Section 116-16, Tax Block 1, Lot 2 and Section 116-20 property tax Block 1, and is currently zoned as OB-2 (Office/Business). The City-owned property is currently undeveloped, with the exception of: 1) Shaft No. 19 of the Delaware Aqueduct, situated on the eastern side of the Mount Pleasant parcel with an access road off Grasslands Road/Route 100C; 2) the Catskill Aqueduct Connection Chamber, adjacent to the Greenburgh parcel with an access road off Grasslands Road/Route 100C; 3) an electrical substation (owned and maintained by Con Edison), situated off Grasslands Road/Route 100C on the Greenburgh parcel; 4) Walker Road, west of the Mount Pleasant parcel that provides access to a satellite bus facility associated with Westchester County's Bee-Line Transit System; and 5) the historic Hammond House, adjacent to Grasslands Road/Route 100C on the Mount Pleasant parcel. The

⁶ A four-acre easement was recently provided to Westchester County for the extension of Walker Road along the western boundary of the site; this reduced the acreage from the 87 acres formerly reported.

closest residents are located to the north along Cottage Road, with the closest residential neighborhood located to the southeast along Taylor Road. The Eastview Site is accessible from several arterial roadways, including the Sprain Brook Parkway to the east and the Saw Mill River Road (Route 9A) to the west, both north-south roadways.

Construction of the proposed Croton WTP project, if it were located at the Eastview Site, would include a new raw water⁷ connection to convey untreated water from the NCA to the water treatment plant site; a raw water pumping station (RWPS) that would deliver the raw water to the head of the proposed plant; a main treatment building located predominantly aboveground that would house all the process elements, plant offices, a conference room, a small process laboratory, maintenance and storage facilities, and the electrical and heating ventilation and air conditioning (HVAC) rooms; a guard house; and treated water conveyances. The Eastview Site is less secure than the Mosholu Site since the main treatment building is located predominantly aboveground. There is also a concern with this site because it would concentrate the City's water treatment facilities at one site due to the planned construction of the Cat/Del UV Facility at the same site. The treated water connection alternatives are described in Section 3, Proposed Project and Engineering Alternatives. The plant would be placed into operation in 2010. In addition, construction of the proposed plant would require the stabilization of several off-site Croton System facilities in order to pressurize the NCA south of the Eastview Site if the NCA is chosen as the treated water conveyance. The off-site location points at which significant activity would occur have been identified as the following: NCA Shaft No. 9 (the Village of Sleepy Hollow, NY), NCA Shaft No. 14 (Ardsley, NY), NCA Shaft No. 18 (Yonkers, NY), Gate House No. 1 (Bronx, NY), as well as modifications to the facilities in and around the Jerome Park Reservoir (Bronx, NY). Work at these locations along the NCA is described in Section 8, Off-Site Facilities.

The use of space at the Eastview Site has been maximized by placing the proposed plant in a location on the property that has been previously cleared of trees. The facility uses stacked components and other space-saving design to save on space and cost. The space savings are intended to preserve the remainder of the site in its current condition and to allow for the construction of other water treatment facilities if future needs require additional construction on the City-owned property. However, the construction of the Croton WTP at the same site and approximately on the same schedule of the Cat/Del UV Facility complicates the utilization of this site. It would require that additional stockpiling and staging for excavated material for the Cat/Del UV facility would have to be utilized, further increasing the impacts of both projects and adding costs.

The proposed plant would be designed such that the main flow of water through the treatment processes would be by gravity, with pumping used to lift raw water 235 feet to the entrance of the treatment process at the proposed plant. Treated water would flow by gravity to the High Level and Low Level service (see Section 5.3.6). Low Level service would be provided in the City from the High Level service by distributing water from existing boundary valves and pressure regulators. The average design flow would be 144 mgd with a maximum design flow of 290 mgd.

⁷ Raw water refers to fresh untreated water.

2.2.1. Raw Water Conveyance and Pumping

Raw water would be conveyed from the Croton Lake Gate House to south of Shaft No. 10 as it is currently operated. One of the water quality problems to be addressed is an occasional episode of elevated color due to iron and manganese in the water. The anthracite filter medium proposed for the WTP would remove the metals, but if, in the future, granulated activated carbon were used instead of anthracite because of its superior ability to remove organic contaminants, potassium permanganate would be added at the 1890 Gate House at the Croton Lake Gate House Site. This involves adding several plastic bins and mixing equipment to the inside, replacing existing unused copper sulfate dosing equipment. No environmental impacts are anticipated from this single action and no further analysis of the Croton Lake Gate House is included.

The raw water would be withdrawn from the NCA, downstream of the existing NCA Shaft No. 10. A new 12-foot diameter raw water tunnel would extend approximately 7,500 feet from the NCA to the proposed plant. The raw water tunnel would be lined with unreinforced, cast-in-place concrete built entirely in rock with the minimum depth of 60 feet below existing grade. The tunnel would convey on average 144 mgd or a maximum of 290 mgd of water to the intake shaft at the proposed plant. The raw water pumping station would deliver water from the intake shaft to the head of the proposed plant at an elevation of 330 feet, a lift of 235 feet. The raw water pumping station, approximately 210 feet below the existing grade would be constructed at the extreme western end of the proposed plant.

2.2.2. Treated Water Conveyance and Pumping

For the proposed project if located at the Eastview Site, two engineering alternatives, pressurizing the NCA or the proposed Kensico-City Tunnel (KCT) are under investigation for conveying treated water to the City over the long term. An Interim/Permanent Backup System would connect the water treatment plant to the via a 1,950 foot pipeline entirely on the NYCDEP Eastview property to the Delaware Aqueduct. This alternative could be used either intermittently as work progresses on the NCA or the proposed KCT, or as a permanent backup system. If the proposed KCT proceeds, it would take many years to complete the design. Therefore, the introduction of a proposed KCT would result in a separate environmental review. A generic description of potential impacts of the proposed KCT is included in this Final SEIS, but sufficient engineering information to conduct detailed environmental reviews would not be available for several years.



Aerial View of the Proposed Project at the Eastview Site

Croton Water Treatment Plant

Project	Raw Water	Treated Water	Off cite Excilition	Connections to Dist	ribution Systems
WTP Site	Conveyance	Conveyance	On-site Facilities	Low Level Service	High Level Service
Interim/ Permanent Back-up Treated Water Conveyance, treated water connection to the Delaware Aqueduct	A maximum of 290 mgd of raw water would be withdrawn fromThe treated water would be conveyed to the DelawareNCAAqueduct via downstream of NCA Shaft No.Shaft No. 19, located on the Eastview Site.10. The raw water pumping etation wouldEastview Site.	As part of a separate NCA baseline rehabilitation project, subject to an independent environmental review, NCA facilities from the Croton Lake Gate House to NCA Shaft No. 10 would be rehabilitated to convey raw water.	Treated water would be delivered to Low Level Service via Catskill/Delaware water supply system.	Treated water would be delivered to High Level Service via Catskill/Delaware water supply system.	
Long Term Conveyance Alternative, lining of the NCA for pressurized flow.	be located beneath the western end of the plant.	High pressure treated water would be discharged to NCA downstream from NCA Shaft No. 10 via a new treated water tunnel. The NCA would be rehabilitated to handle the high- pressure flow from the Eastview site to Jerome Park Reservoir.	As part of a separate NCA baseline rehabilitation project, subject to an independent environmental review, NCA facilities from the Croton Lake Gate House to NCA Shaft No. 10 would be rehabilitated to convey raw water. NCA shafts and Gate Houses from NCA Shaft No. 10 to NCA Shaft No. 21 would be modified and rehabilitated. Shafts would be sealed with pressure caps	Low Level treated water would be provided from the High Level Service through sleeve valves and connection to the existing Valve Chamber C to deliver water to the East Bronx. The Low Level Service to South Bronx would be provided from the connection at Shaft No. 21 to the existing 48-inch service pipe in the Jerome Park Reservoir north basin. Treated water would also be discharged to the Low Level Manhattan service through sleeve valves from the new shaft chamber to the NCBA.	High Level treated water would be delivered to a new shaft chamber, located at the Jerome Park Reservoir, and distributed to City Tunnel No. 1, Shaft Nos. 3 and 4 and to City Tunnel No. 3, Shaft No. 4B.

TABLE 3. CROTON WATER DISTRIBUTION COMPONENTS OF THE EASTVIEW SITE

Project	Raw Water	Treated Water	Off cite Excilition	Connections to Dist	ribution Systems
WTP Site	Conveyance	Conveyance	On site ruchites	Low Level Service	High Level Service
Long Term Conveyance Kensico City Tunnel (KCT); deliver filtered Croton water to Shaft No. 19 as in the Interim Conveyance alternative above. This water would mix with treated Catskill / Delaware water and flow through a new proposed Kensico- City Tunnel to the City.	Same as above.	Croton water would be conveyed along with the Catskill / Delaware water supplies via a new tunnel to the City. All the Croton water would be blended with the Catskill / Delaware water.	New Croton Aqueduct would be maintained for emergency purposes and for conveying plant overflows or shutdowns to Jerome Park Reservoir	Same as above	Existing High Level Service would be supplied from the Catskill / Delaware system with Croton water blended.

TABLE 3. CROTON WATER DISTRIBUTION COMPONENTS OF THE EASTVIEW SITE

Notes:

1. Levels (Low, Intermediate, and High) refer to the topographic height of the neighborhoods served. For example, Low Level Service includes low-level areas of the East and South Bronx and Manhattan. This water is transmitted through the distribution system at a lower level than the Intermediate and High Level Service. Intermediate Level Service would be provided from the High Level Service via existing regulators in the distribution system. The existing Intermediate Level service connections would be placed off-line.

The following Interim connection would be constructed to provide Croton water during pressurization of the NCA or during the construction of the proposed KCT. The connections would be available on a permanent basis to provide a backup conveyance for Croton water.

2.2.3. Interim/Permanent Backup System

Upon completion of the proposed plant, treated water would be conveyed to the Delaware Aqueduct via Shaft No. 19, located on the Eastview Site. Treated water would pass through flow meters, and be combined into one 14-foot diameter steel pipe. This pipe would be routed approximately 1,950 ft to Shaft No. 19 of the Delaware Aqueduct, on the eastern side of the site. The maximum water level at Shaft No. 19 is 342.70 ft MSL. The pipe route would follow the existing topography and the route would follow the edge of the existing wetlands to the property boundary. Since treated water would be conveyed to the Delaware Aqueduct via Shaft No. 19, the Jerome Park Reservoir would no longer remain in service. To meet the fluctuating water supply needs of the City the Croton Lake Gate House (CLGH) would need to constantly adjust flow in the NCA, because the New Croton Reservoir would be the final raw water reservoir before water reaches the WTP for treatment at the Eastview site.

During the interim and back-up operations, the City's Low Level and Intermediate Services would be supplied from the in-City High Level Service, using existing pressure reducing valves and regulators. Implementation of an adopted long-term treated water conveyance would downgrade the Shaft No. 19 connection to a permanent (emergency) back-up system.

2.2.4. Long Term Treated Water Conveyance Alternatives

Two long-term alternatives for the conveyance of treated water from the Eastview Site are under consideration. One alternative would convey the water through a treated water tunnel to a pressurized NCA. The other would convey the water to the new KCT. Neither of these alternatives would require any pumping of treated water because the outlet from the water treatment plant is above the level of the water in the High Level Service.

2.2.4.1. New Croton Aqueduct Pressurization

A new treated water tunnel would convey pressurized (High Level) treated water from the proposed plant to the NCA. The new treated water tunnel would connect to the NCA below ground, immediately downstream of the concrete plug in the NCA that would be constructed downstream of the proposed raw water tunnel. The NCA downstream of the treated water tunnel connection would convey High Level treated water to a new shaft chamber located in the vicinity of Gate House No. 5 at Jerome Park Reservoir. High Level and Low Level treated water would be conveyed from the new shaft chamber to Manhattan and the Bronx. This alternative would require the lining and pressurization of the entire gravity flow section of the NCA downstream of the connection with the new proposed treated water tunnel. A schematic of this conveyance alternative is provided in Figure 7.



Not To Scale

General Site Plan Eastview Site



Not to Scale

General Arrangement of NCA, New Tunnels and the Proposed Croton Project at the Eastview Site The only work required in the raw water section of the NCA would be the rehabilitation of the existing overflow weir at Shaft No. 9 in the Village of Sleepy Hollow. This overflow would divert raw water to a small tributary of the Pocantico River, alternatively known locally as Carl's Brook or Welker's Brook. Although the overflow is an existing structure, it is not currently utilized. If the WTP were built at Eastview and the NCA was utilized as the principal means of long-term conveyance the potential for blow off at this location would occur if the WTP at the Eastview Site were to shut down. The potential impacts of the construction and operational use of the overflow at Shaft No. 9 is evaluated in the Off-Site Facilities section of the Final SEIS.

The pressurization of the NCA below the finished water connection, south of Shaft No. 10, would involve work in addition to the baseline rehabilitation work to the NCA described earlier as a separate environmental review. This additional work would take place after the WTP is completed, between 2010 and 2015. The principal staging areas and access points for the workers for this project would be Shaft No. 14 in the Village of Ardsley, Shaft No. 18 in the City of Yonkers, Gate House No. 1 in Van Cortlandt Park, the Bronx, and Shaft No. 21 at Jerome Park Reservoir in the Bronx. Access to the short length of the NCA south of the plug in the Aqueduct that would separate raw water from the finished water tunnel connection to the siphon at Shaft 11A would be attained from the finished water tunnel shaft at the Eastview Site. All the shaft facilities would be fitted with pressure caps. The existing sluice gates and stop logs in Gate House No. 1 would be replaced with new sluice gates. A new shaft chamber and connections to distribution pipes would be constructed in the vicinity of Gate House No. 5. In addition, Shaft Nos. 11A, 11B, and 11C, in the Town of Greenburgh, and Shaft No. 16 in the Village of Ardsley would be used for ventilation, personnel access, and lowering of equipment and supplies, but then pressure capped or permanently sealed. Construction workers would obtain access to the NCA between the treated water connection and Shaft No. 11A from the Eastview Site. Since treated water would be conveyed to the New Croton Aqueduct under pressure, the Jerome Park Reservoir would no longer remain in service, but would be retained for City Water Supply use as an emergency supply and to receive overflows from the water treatment plant or the NCA. To meet the fluctuating water supply needs of the City the Croton Lake Gate House (CLGH) would need to constantly adjust flow in the NCA, because the New Croton Reservoir would be the final raw water reservoir before water reaches the water treatment plant for treatment at the Eastview site.

The work if the NCA is pressurized at each of these sites is described below in the Off-Site Facilities section.

2.2.4.2. Kensico-City Tunnel

This KCT project involves the construction of an entirely new tunnel from the Kensico Reservoir to the Eastview Site and from there to the City's water distribution system. This new tunnel could potentially be sized to accommodate all of the City's flows, be able to bypass the existing Hillview Reservoir in the City of Yonkers and provide system redundancy for future maintenance of the other conveyances. If the Croton System were to use this new tunnel, the NCA would be used for emergencies and for system overflows.

The proposed KCT is still at the stage of a feasibility study. Its primary purpose would be to provide system flexibility for the Catskill/Delaware supplies. The feasibility study describes three alternative alignments, including three possible intake locations alongside Kensico Reservoir. No specific shaft sites are recommended, but all the alternatives under consideration terminate at the Van Cortlandt Valve Chamber in the Bronx. Siting of the shafts would require a thorough environmental impact analysis. The shaft sites would potentially have to accommodate up to 140 workers and would generate truck traffic from the removal of spoils. This truck traffic would be less than 120 trucks per day, but the long duration of the construction (about 15 years) would require a detailed analysis of the impacts of this proposed work on Traffic, Air, Noise, and other environmental parameters. If construction of this new tunnel were to be proposed by NYCDEP there could be up to a year's overlap between the start of the KCT work and the completion of the Croton WTP at the Eastview Site. The KCT design is still in the future, and if it is adopted it would be subject to a separate thorough public environmental review. If a decision were made to advance the proposed KCT and use it as the long-term treated water conveyance, the pressurization of the NCA would not proceed. The Croton water would be blended with the Catskill and Delaware water and conveyed at the same pressure to the City. Existing boundary valves and regulators would supply the existing Intermediate and Low Level distribution systems.

2.2.5. Emergency Bypass and Blow-Off

If the proposed plant is taken out of service and the Croton Water Supply was required to meet demand, an emergency bypass, subject to NYSDOH review and approval, would be available to convey Croton water downstream of the proposed plant. If the KCT were chosen as the long-term treated water conveyance, an overflow structure would be constructed in the NCA at the raw water tunnel connection. If the proposed plant were taken out of service, raw water would fill the wet well and detention tank at the raw water pump station. The water would rise to a maximum level and cause the water to reverse direction and overflow at the weir located in the NCA. Water would flow through the NCA via gravity to Jerome Park Reservoir. Low Level water could be conveyed through the NCA to Manhattan.

If the design for the pressurized treated water to the NCA is chosen as the long term treated water conveyance, the overflow structure in the NCA would not be capable of serving as an emergency bypass. A plug would be installed upstream from the treated water tunnel connection to the NCA and the overflow structure would be sealed. Subject to NYSDOH approval, a connection at the proposed plant from the raw water shaft to the treated water shaft would serve as a bypass and allow untreated Croton water to be conveyed to the NCA downstream of Shaft No. 10. Due to the loss of power, no pumping would be available and Low Level water would be distributed to the new shaft chamber at Jerome Park Reservoir. Alternatively, the water could be allowed to back up in the raw water section of the NCA and overflow through the existing blow-off at Shaft No. 9 in the Village of Sleepy Hollow, NY. Potential environmental impacts to the area around Shaft No. 9 and to the receiving waters of Carl's Brook and the Pocantico River are described in the Final SEIS.

2.3. MOSHOLU SITE

The proposed plant would be located beneath part of the 13-acre driving range of the 74-acre Mosholu Golf Course, located within the 1,146-acre Van Cortlandt Park (Park), Bronx, New York as shown on Figure 8. The Mosholu Golf Course section of the Park is bounded by the Mosholu Parkway and Major Deegan Expressway to the west and north, Jerome Avenue and the IRT No. 4 elevated train tracks and Woodlawn Subway Station to the east, and West Gun Hill Road to the south. Across Jerome Avenue to the northeast of the site is the Woodlawn Cemetery. The Shandler Recreation Area abuts the golf course to the north and the Saturn playground is located to the southeast. Existing facilities at the site include a clubhouse, maintenance facility, driving range, nine-hole golf course, and a parking lot for approximately 75 cars.

Construction of a proposed Croton WTP at the Mosholu Site would include a new raw water tunnel to convey untreated water from the NCA to the water treatment plant site; a raw water pumping station; a main treatment building located underground that would house all the process elements, administrative offices, a conference room, a small process laboratory, maintenance and storage facilities, electrical and heating, ventilation and air conditioning (HVAC) rooms; a treated water pumping station; and a new treated water tunnel to convey treated water from the proposed plant back to Jerome Park Reservoir (JPR) and the City's distribution system. The main treatment plant would be entirely below grade. Continuous dewatering would be required to remove groundwater that would infiltrate into the excavation during construction and operation. The Mosholu site is the most secure site since the treatment facilities are located below ground. During construction, an approximately 800-foot long ornamental wall would be constructed along Jerome Avenue that would provide a visual barrier and aid in noise attenuation. In addition, construction of the proposed plant would require the rehabilitation and stabilization of several off-site Croton System facilities. The off-site location points where activity would occur include the following: Gate House No. 1 (Bronx, NY) and modifications to the facilities in and around the Jerome Park Reservoir (Bronx, NY). Work required at these offsite locations is described in Section 8, Off-Site Facilities.

The proposed plant would require a footprint of about nine acres, which would include the water treatment facility, unloading and access building, parking lot, and treated water connections to the City's distribution system via the NCA and City Tunnels No. 1 and No. 3. A listing of the Croton water distribution system components related to the Mosholu Site is included in Table 4. The facilities would be installed below-grade and the surface of the proposed plant would be restored to create a public golf driving range. A new golf course clubhouse, maintenance facility, and new golf course parking lot would be built on the existing Mosholu Golf Course property. Temporary facilities would be provided during construction so that the golf course operation would be able to continue during construction.

Areas of the Mosholu Site that would require restriction from public access include the WTP rooftop, which would be under the future driving range, and the approximately two-acre secure area north of the existing parking lot that would be used for NYCDEP parking, the chemical fill building, and the arrivals/receiving building. These areas would be restricted to vehicles by low stone walls or other structures such as the tee-boxes for the driving range along the east side of



Aerial View of the Proposed Project at the Mosholu Site

Raw Water		Off-site	Connections to Distribution Systems		
Conveyance	I feated water Conveyance	Facilities	Low Level Service	High Level Service	
A 900-foot long, 12-foot inside diameter tunnel would deliver raw water by gravity to the WTP from the NCA. The connection would be made downstream of NCA Shaft No. 20. A Raw Water Pumping Station would lift the raw water to the water treatment process units.	For Low Level Service, treated water from the Treated Water Pumping Station would flow to the pressurized NCA via a new treated 9-foot diameter tunnel to a new shaft chamber near Jerome Park Reservoir. From there a second new 9- foot diameter Low Level tunnel would convey water to the NCA, downstream of Shaft No. 21. The new shaft chamber would convey Low Level treated water to Manhattan. Intermediate Level Service water would be supplied from the High Level Service, using existing pressure reducing valves and regulators. For High Level Service, an 8-foot diameter tunnel would convey treated water from the Treated Water Pumping Station to a new shaft chamber located near JPR.	A new shaft chamber and flow meters would be installed near the Jerome Park Reservoir. Jerome Park Reservoir would function as a raw water reservoir.	Low Level Service water would be conveyed from the WTP to the new shaft chamber located near Jerome Park Reservoir via a 9-ft diameter tunnel. The water would be conveyed from the new shaft chamber to the NCA, downstream from NCA Shaft No. 21, through a second new 9-foot diameter tunnel that would deliver the water to Manhattan. The East Bronx would receive their Low Level Service water from a new 48-inch diameter pipe, which would be constructed from the new shaft chamber to the existing Valve Chamber "C." The South Bronx would receive their Low Level Service water through a new Flow Meter "D," which would connect to the existing 48-inch diameter service near Jerome Park Reservoir.	High Level Service water would be pumped from the WTP wet wells through a new 8-foot diameter tunnel to the new shaft chamber near Jerome Park Reservoir. The water would be distributed from the new shaft chamber to City Tunnel No. 1, Shaft No. 3, and Shaft No. 4; and City Tunnel No. 3, Shaft No. 4B. A future connection would be constructed to convey an additional 155 mgd. An 84- inch diameter pipe would be constructed from the WTP to Jerome Ave. and stubbed. Existing trunk mains within Jerome Ave. would be replaced with larger diameter pipes to convey the additional flow and would connect to the proposed 84-inch diameter pipe.	

TABLE 4. CROTON WATER DISTRIBUTION COMPONENTS OF THE MOSHOLU SITE

Levels (Low, Intermediate, and High) refer to the topographic height of the neighborhoods served. For example, Low Level Service includes low-level areas of the East and South Bronx and Manhattan. This water is transmitted through the distribution system at a lower level than the Intermediate and High Level Service. Intermediate Level Service would be provided from the High Level Service via existing regulators in the distribution system. The existing Intermediate Level service connections would be placed off line.

the driving range. The stone walls along the north and south sides would incorporate ventilation louvers and would serve as the foundation for a tall fence that would keep golf balls from leaving the driving range. The facades of the low stone walls would be designed to look like the existing rock walls along Jerome Avenue north of Gun Hill Road, although their internal construction would be designed to serve as a vehicle interdiction wall.

2.3.1.1. Department of Parks and Recreation Facilities.

It is the intent of NYCDEP to share the land required for the WTP at the Mosholu Site with the NYCDPR to the fullest extent possible so that existing uses can continue into the future. Details of the plans to share the site with the NYCDPR for public recreational uses would be memorialized in a Memorandum of Agreement between NYCDPR and NYCDEP if this site is selected for the WTP. In anticipation of this MOA, the design for the WTP and related facilities already incorporate plans that would facilitate the sharing of the site.

The entrance road to the Mosholu Golf course would be improved but would remain in the existing location. The new road would fork approximately 350 ft. west of Jerome Avenue. The fork to the south would convey public traffic to a new club house and parking area near the driving range. The fork to the west would pass through a security checkpoint to a secure area of about two acres that would enclose the chemical fill station, arrivals/receiving building, and NYCDEP parking. This area would be screened from casual public view by a low stone wall or the natural topography that would serve to block vehicles, plantings and a fence.

The current NYCDPR maintenance facility for the golf concessionaire consists of a pair of sheds west of the current parking area. These sheds are in poor repair. They would be replaced by a new facility located just north of their current location and adjacent to the NYCDEP secure area. Access to the driving range for NYCDPR maintenance of the driving range would be provided.

2.3.2. Raw Water Conveyance and Pumping

The NCA would be used to convey raw water from the New Croton Reservoir to the proposed plant at the Mosholu Site. The quantity of raw water entering the NCA would be determined by the operation of the flow control valves at the Croton Lake Gate House. Raw water would flow through the NCA to Gate House No. 1. At Gate House No. 1 raw water would be directed through either the NCA or the New Croton Branch Aqueduct (NCBA) or a combination of both.

During average demand flow conditions all flow would be directed to the NCBA. Raw water would be conveyed through the NCBA to Jerome Park Reservoir. The Jerome Park Reservoir (both the north and south basins) would be used as a raw water reservoir. Gate House No. 5 would supply raw water from the Jerome Park Reservoir to the NCA (via Shaft No. 21) through an 11-foot diameter conduit. A plug would be installed just south of Shaft No. 21 to direct flow in the NCA northward to the new raw water tunnel located in the Mosholu Golf Course area of Van Cortlandt Park (Bronx, New York). The new raw water tunnel would extend from the NCA connection to a new raw water shaft located within the existing driving range to the west of the proposed plant. Raw water pumps would lift the water to the plant inlet. After this initial

pumping, water would then flow by gravity through all the main treatment processes within the proposed plant.

During maximum demand flow conditions raw water would be directed at Gate House No. 1 through the NCA and the NCBA. Raw water from the NCBA would flow through the Jerome Park Reservoir and be directed northward through the NCA to the proposed plant. Raw water diverted to the NCA from Gate House No. 1 would be directed to the new raw water tunnel and flow to the raw water shaft at the proposed plant. If the Jerome Park Reservoir were taken offline, all flow would be diverted to the NCA from Gate House No. 1 and be directed to the proposed plant.

Raw water would be conveyed to the proposed plant from the NCA by gravity flow through an approximately 900 foot long, 12-foot diameter tunnel. The tunnel would connect to the NCA downstream of NCA Shaft No. 20. Although the raw water tunnel would be 195 feet below grade, the pressure in the tunnel would raise the water most of the way to the surface. The Raw Water Pumping Station would lift the raw water an additional 35 feet from the NCA hydraulic grade line into the plant for treatment. See Figure 9 for the general arrangement of the NCA, the new tunnels, and the proposed plant.

2.3.3. Treated Water Conveyance and Pumping.

A new shaft would be constructed west of the proposed plant to contain a new 9-foot diameter Low Level treated water conduit and a new 7-foot diameter High Level treated water conduit. A new combined treated water tunnel would be constructed from the bottom of this shaft at the water treatment plant site to a new shaft chamber located near Jerome Park Reservoir. This new tunnel would be approximately 3,680 feet long and would be sufficiently large enough to contain both a 7-foot diameter High Level Service treated water pipe and a 9-foot diameter Low Level Service treated water pipe between the shaft at the water treatment plant site and the new shaft chamber. At the new shaft chamber, the Low Level tunnel would reduce in size and connect to the NCA downstream of Shaft No. 21 to convey Low Level treated water to Manhattan. This tunnel is anticipated to be approximately 650 feet in length and contain an 8-foot diameter conduit.

2.3.4. Emergency Bypass

If the proposed plant is taken out of service and the Croton System is required to meet demand, subject to NYSDOH approval, untreated Croton water could be fed into the distribution system from the Jerome Park Reservoir.



Not to Scale

General Arrangement of the NCA, New Tunnels and the Proposed Croton Project at the Mosholu Site

Croton Water Treatment Plant

2.4. HARLEM RIVER SITE

The Harlem River Site is located in the Borough of the Bronx, New York. If the project were located at this site, the City would acquire approximately 17.5 acres of land for the proposed plant. The proposed site is located along the Harlem River near the West Fordham Road/University Heights Bridge with Exterior Street and part of the MTA Metro-North Railway Hudson Line on the east and the West 225th Street/Kingsbridge Road to the north (Figure 10). New York City Department of Transportation, Consolidated Edison Company of New York, Inc. (Con Edison), "Storage Post" Self-Storage (under construction, formerly Butler Lumber) XCEL Ready Mix batching plant, and the CSX Corporation currently occupy the water treatment plant site north of University Heights Bridge. The proposed site is identified by property tax Block 3231, Lot 350; Block 3244, Lot 100; Block 3244, Lot 120; Block 3244, Lot 145, Block 3244, Lot 160, Block 3244, Lot 1, and Block 3245, Lot 3. The current zoning of the site consists of M3-1, M2-1, and M1-1 (Manufacturing).

If the project were located at this Site, construction of the proposed Croton WTP would include a new raw water tunnel to convey untreated water from the NCA to the water treatment plant site; a raw water turbine and pressure reducing facility located aboveground that would deliver the raw water to the head of the proposed plant while recovering energy; a treatment building located above ground that would house all the process elements, administrative offices, a conference room, a small process laboratory, maintenance and storage facilities, electrical and heating, ventilation and air conditioning (HVAC) rooms; a treated water pump station; a guard house; and treated water conveyances. A bulkhead in the Harlem River at the existing pierhead and bulkhead line would be built in order to maximize the available land area for the turbine and pressure reducing facility, and the treatment building. The site is about 350 ft. wide at its widest and 2,200 feet long. An area at the south end of the site contains a 1.3 acres water inlet (cove). The Harlem River Site is less secure than both the Mosholu and Eastview sites, since it is located adjacent to the Harlem River, Major Deegan Expressway, and the Metro-North Railroad. The treated water connection alternatives are described in greater detail in Section 3, Proposed Project and Engineering Alternatives. In addition, construction of the proposed plant would require stabilization of several off-site facilities, including modifications to the facilities in and around Jerome Park Reservoir (Bronx, NY). Work described at these off-site locations is described in Section 8, Off-Site Facilities.

The proposed plant would require a footprint of about eleven acres, which would include the water treatment facility, parking lot, and other support facilities. The proposed plant would be a primarily above-grade structure, approximately 65 feet high. A listing of the Croton Water distribution system components related to the Harlem River Site is included in Table 5.

2.4.1. Raw Water Conveyance and Pumping

Raw water would be conveyed to the proposed plant from the NCA via a new 10-foot diameter tunnel 1,415 feet long. The invert of the raw water tunnel at the new shaft would be at Elevation -60 feet, approximately 70 feet below grade. The raw water tunnel would be connected to the



Aerial View of the Proposed Project at the Harlem River Site

Croton Water Treatment Plant

Figure 10

			Connections to Distribution Systems ¹		
Raw Water Conveyance	Treated water Conveyance	Off-site Facilities	Low Level Service	High Level Service	
10-foot diameter tunnel from NCA downstream from Jerome Park Reservoir to the WTP. Turbines would be used to lower the pressure and recover energy.	For Low Level Service, treated water from the Treated Water Pumping Station would flow to the pressurized NCA via a new 7-foot diameter tunnel downstream of Shaft No. 22. A plug would be installed to separate the raw water from the treated water. For High Level Service, new 9-foot diameter tunnel would convey treated water from the Treated Water Pumping Station to a new shaft near Jerome Park Reservoir.	A new shaft, valve chambers, and flow meters would be installed near Jerome Park Reservoir. Jerome Park Reservoir would function as a raw water reservoir.	In addition to providing Low Level Service via the NCA, a new 4-foot diameter pipe would be constructed from the new shaft chamber to the existing valve chamber "C" to deliver up to 30 mgd of Low Level treated water to the East Bronx. Low Level service could also be conveyed, through sleeve valves, from the new shaft chamber to the South Bronx. A new flow meter (flow meter chamber "D") would connect to the existing 4-foot diameter service near Jerome Park Reservoir. This service continues along the floor of the south basin of Jerome Park Reservoir and bypasses	High Level treated water would be distributed from the new shaft chamber to City Tunnel No. 1, Shaft No. 3, Shaft No. 4, and City Tunnel No. 3, Shaft No. 4B. Flow meters would be located on each connection to measure flows from the new shaft chamber to the High Level System.	

TABLE 5. CROTON WATER DISTRIBUTION COMPONENTS OF HARLEMRIVER SITE

Notes:

1. Levels (Low, Intermediate, and High) refer to the topographic height of the neighborhoods served. For example, Low Level Service includes low-level areas of the East and South Bronx and Manhattan. This water is transmitted through the distribution system at a lower level than the Intermediate and High Level Service. Intermediate Level Service would be provided from the High Level Service via existing regulators in the distribution system. The existing Intermediate Level service connections would be placed off-line.

NCA upstream from Shaft No. 22 and convey up to 290 mgd to the proposed plant. A concrete plug would be installed downstream from this tunnel connection to prevent raw water flow to the Manhattan Low Level Service. There would also be a turbine station within the raw water shaft to reduce pressure and recover energy as the raw water would enter the proposed plant (Figure 11). Under the proposed project, the Jerome Park Reservoir would remain in service as a raw water reservoir, and act as a balancing reservoir to meet the fluctuating water supply needs of the City.

2.4.2. Treated Water Conveyance and Pumping

Treated water would be conveyed from the wet well/treated water pumping station through a combined treated water tunnel; consisting of a High Level Service tunnel, and a Low Level Service tunnel. The combined tunnel would be 350 feet long and would have a diameter of 24 feet. The combined tunnel would cross beneath the Metro-North Rail Road tracks and the Major Deegan Expressway (Interstate 87). At these crossings, the tunnel would be constructed using soft ground tunneling techniques. This is a complex technique that can be quite slow. In addition the rail tracks and the expressway would have to be supported from beneath while the tunnel would progress.

Upon exiting the combined tunnel, the High Level tunnel, which would be 6,640 feet long, would convey up to 290 mgd of the High Level Service treated water to the new Shaft Chamber in the vicinity of the Jerome Park Reservoir. Treated water would be distributed to High Level Service City Tunnel No. 1, Shaft Nos. 3 and 4, and to City Tunnel No. 3, Shaft No. 4B. Flow meter chambers would also be installed to measure the treated water conveyed to City Tunnel No. 1 (Flow Meter Chamber B) and City Tunnel No. 3 (Flow Meter Chamber C).

High Level treated water could also be conveyed from the new Shaft Chamber to the Low Level System through sleeve valves. A new pipe would be constructed from the new Shaft Chamber to the existing Valve Chamber C to deliver up to 30 mgd of Low Level treated water to the East Bronx. Low Level Service could also be conveyed, through sleeve valves, from the new Shaft Chamber to the South Bronx. A new flow meter (Flow Meter Chamber D) would connect to the existing service in the vicinity of Jerome Park Reservoir. This service continues along the floor of the south basin of the Jerome Park Reservoir and by passes Gate House No. 6.

Low Level treated water would be pumped from the proposed plant to the NCA downstream of Shaft No. 22 via a new Low Level treated water tunnel. The treated water tunnel would supply up to 155 mgd of treated water to Manhattan.

Upon exiting the combined tunnel, the Low Level tunnel, which would be 1,200 feet long, would convey up to 155 mgd of Low Level treated water to the NCA downstream of NCA Shaft No. 22. At the point of connection of the Low Level tunnel to the NCA, rock dowels and welded wire fabric would be used to support the rock. A tunnel plug, made of cast-in-place concrete, would be installed upstream of NCA Shaft No. 22 to provide a complete physical separation of raw and treated water. The Low Level tunnel would be constructed in rock using drill-and-blast methods and immediate rock support to maintain stable ground. This blasting is not anticipated to cause significant vibrations on the surface; see Section 7.10, Noise, for further details. NCA Shaft No. 22 would be kept open for operations and maintenance purposes.

Intermediate Level Service to the Bronx would be supplied through the in-City High Level service using existing regulators. This would replace the Jerome Pumping Station, which would be taken off line.



General Arrangement of the NCA, New Tunnels, and the Proposed Croton Project at the Harlem River Site

Croton Water Treatment Plant

High Level treated water would be pumped from the pump station wet wells to a new shaft chamber located near the Jerome Park Reservoir, via a new treated water tunnel. The new treated water tunnel would be 9-foot diameter and would supply High Level treated water to the distribution system. High Level treated water would be distributed from the new shaft chamber to City Tunnel No. 1, Shaft No. 3, Shaft No. 4, and to City Tunnel No. 3, Shaft No. 4B. These new High Level service connections would replace the Mosholu Pumping Station, an existing facility, which would be taken off-line but retained by the NYCDEP.

Intermediate Level service to the Bronx would be supplied through the in-City High Level service using existing regulators. This would replace the Jerome Pumping Station, which would be taken off-line but also retained by the NYCDEP.

Low Level treated water would be pumped from the proposed plant to the NCA downstream of NCA Shaft No. 22 via a new Low Level treated water tunnel. The treated water tunnel would be 7-foot diameter and would supply up to 155 mgd of treated water to Manhattan. Low Level treated water could also be conveyed from the new shaft chamber near the Jerome Park Reservoir after passing through sleeve valves. A new 4-foot diameter pipe would be constructed from the new shaft chamber to the existing valve chamber "C" to deliver up to 30 mgd of Low Level treated water to the East Bronx. Low Level service could also be conveyed, through sleeve valves, from the new shaft chamber to the South Bronx. A new flow meter (flow meter chamber "D") would connect to the existing 4-foot diameter service near the Jerome Park Reservoir.

2.4.3. Emergency Bypass

Subject to approval by the NYSDOH, if the proposed Croton WTP is taken out of service and Croton water is required to meet demand, a connection at the Harlem River Site between the raw water shaft and the Low Level treated water shaft would enable untreated Croton water to be conveyed back to the NCA downstream of NCA Shaft No. 22.

2.5. OFF-SITE FACILITIES

Table 6 summarizes the work at sites outside of the proposed water treatment plant site alternatives. The locations along the NCA would only be required if the NCA is pressurized as part of the Eastview Site alternative instead of relying upon the KCT alternative. The subsections that follow the table summarize the specific work at each of the sites described in the table below.

Location	Eastview NCA	Eastview KCT	Mosholu	Harlem River
Croton Lake Gate House - Used	Install Potassium permanganat	e equipment for intermittent		
to select the best quality water at	treatment of iron and manganes	se.		
the desired flow rate to enter the				
NCA for conveyance to the Croton				
WTP				
	Upgrade existing control system	n to communicate with the new	v control system at the W	TP.
	2009.		2010	
NCA Shaft No. 9 – Would	Rehabilitate existing blow-off of	butlet at this Shaft.		
convey water into welker's				
Brook, which hows hito the				
overflow in the NCA				
	Could receive more frequent bl	ow-offs during operations	-	
		ow one camig operations.		
			-	
	2011-2015	F		
NCA Shaft No. 14 - Would allow	Overflow would be sealed.			
water to flow from the NCA to	Would be modified to			
Sprain Brook in the event of an	accommodate pressurized			
overflow in the NCA	10W in the NCA.			
NCA Shaft No. 18 Would allow	2011-2013 Would be modified to			
water to flow from the NCA to	accommodate pressurized			
Tibbet's Brook in the event of an	flow in the NCA			
overflow in the NCA				
	2011-2015			
Gate House No. 1 - Used to	Would be modified to	Rehabilitate with worker	Rehabilitate with	Rehabilitate with
direct flow either to both basins	accommodate pressurized	safety improvements.	automatic sluice gates	worker safety
of JPR via the NCBA or to	flow to the NCA.		and worker safety	improvements.
Manhattan via the NCA			improvements.	
	2011-2015		2009-2010	

Location	Eastview NCA	Eastview KCT	Mosholu	Harlem River
Jerome Park Reservoir -	Emergency water supply		Add ramp in the south	basin in the vicinity
Operates as a raw water reservoir			of Gate House No. 6.	
for the Croton system			2009-2010	
Gate House No. 7 -	Rehabilitate interior and	Seal pipe connections to the	Rehabilitate interior an	d exterior.
Interconnection to City Water	exterior.	distribution system. The		
Tunnel No. 1		structure would not be used		
	Refurbish and automate	for this alternative.	Refurbish and automation	te sluice gates in the
	sluice gates in the west portal		west portal to the JPR.	
	to the JPR.			
	2011-2014		2006-2007	
Mosholu Pumping Station -	Remove pumps, piping, and mo	otors, place off-line.		
Lifts about 50 mgd of Croton	2011 - 2012			
water from JPR into Shaft No. 3				
from where it can directly supply				
High Level service areas of the				
Bronx or be transmitted to other				
areas of the Bronx and Mannattan				
Cate House No. 5 Used to	Dehabilitate interior and	Seel nine connections to	Dahahilitata interior an	dautorior
Gate House No. 5 - Used to supply Shaft No. 21	A syterior	distribution system The	Kenadintale interior an	u exterior.
supply shart ivo. 21	Remove the corrosion	structure would not be used	Remove the corror	ion inhibitor and
	inhibitor and chlorination	for this alternative	chloringtion aquinme	at after the Croton
	equipment after the Croton	for this atternative.	WTP is completed	it after the croton
	WTP is completed		wir is completed.	
	Remove existing 16-inch		Remove existing 16	-inch diameter raw
	diameter raw water pipe to		water pipe to the Demo	Instration Plant.
	the Demonstration Plant.			
	Seal Chamber No. 22. Seal		Seal Chamber No. 2	2 and refurbish and
	connections to Gate House		automate existing sluic	e gates.
	Nos. 2 and 3 and refurbish		Install Potassium perm	anganate storage and
	existing sluice gates.		mixing facilities.	с с
	2011 - 2014		2009-2010	

Location	Eastview NCA	Eastview KCT	Mosholu	Harlem River
NCA Shaft No. 21 - Used as	Connection from Shaft No.	Seal pipe connections. The	Plug south of Shaft	Continue to use to
transfer conduit for water from	21 to a new Shaft Chamber	structure would not be used	No. 21 to separate	convey raw water
the JPR into the NCA; provides	north of Gate House No. 5.	for this alternative.	raw water from	from JPR
Croton water to the Low Level	Plug north of Shaft No. 21 for		treated Low Level	southward to the
service areas of the Manhattan	Low Level Service to		Service to Manhattan.	WTP.
distribution system	Manhattan.			
	Access point to NCA for constr	ruction crews and materials.		
	Rehabilitation and Upgrades.			
	2011-2014		2009-2010	
Gate House No. 6/Microstrainer	Gate House No. 6 would be tak	en offline and retained for Bur	eau of Water Supply use	
Building - Connects the south				
basin of JPR to the Bronx Low				
Level service area				
	The Microstrainer building wou	uld be demolished.	1	
	2011-2014		2009-2010	
Gate House No. 3 - Used to	Minor structural	Seal pipe connections. The	Minor structural rehabi	litation.
supply Gate House No. 5 from	rehabilitation.	structure would not be used		
South Basin		for this alternative.		
	Close two 48-inch diameter		Close two 48-inch dia	meter gate valves to
	gate valves to the distribution		the distribution system	
	system and connection to			
	Gate House No. 5			
	2011-2014		2009-2010	
Gate House No. 2 - Used to drain	Provide a new overflow	Seal pipe connections. The	Provide a new overf	low facility for the
JPR and supply Gate House No. 5	facility for the north basin of	structure would not be used	north basin of Jeron	ne Park Reservoir:
from North Basin	Jerome Park Reservoir:	for this alternative.	Extend the 30-inch dia	meter drain line from
	Extend the 30-inch diameter		the dividing wall to Ga	te House No. 2.
	drain line from the dividing			
	wall to Gate House No. 2.			

Location	Eastview NCA	Eastview KCT	Mosholu	Harlem River
	Close 48-inch diameter gate valve to the distribution system and connection to		Close 48-inch diamet distribution system	er gate valve to the
	2011-2014		2009-2010	
New Shaft Chamber - Would serve as a central point for distributing treated water to the High Level and Low Level services	Use raised bored construction to drill New Shaft Chamber using the new treated water tunnel from the NCA as access point.	The construction of the New Shaft Chamber would not occur for this proposed alternative.	Use raised bored cons Shaft Chamber using t tunnel from the WTP a	truction to drill New he new treated water s access point.
	2008-2011		2008-2011	
Flow Meter Chamber A - Would measure the flow from the new Shaft Chamber to the East Bronx and South Bronx Low Level service connections	Construct a new 48-inch diameter pipe from the proposed chamber to the existing Valve Chamber "C" to connect to the East Bronx Low Level service.	The construction of Flow Meter Chamber A would not occur for this proposed alternative.	Construct a new 48-inc the proposed chamber Chamber "C" to conne Low Level service. Co 48-inch diameter pi butterfly valve that co Bronx Low Level serv dividing wall.	ch diameter pipe from to the existing Valve ect to the East Bronx onstruct a second new pe to an existing onnects to the South vice just north of the
	2008-2011		2008-2011	
Flow Meter Chamber B - Would measure the flow from the new Shaft Chamber to City Tunnel No. 1, Shaft No. 3	Construct two new 48-inch diameter pipes from the proposed chamber to the existing 48-inch pipes in Goulden Avenue going north	The construction of Flow Meter Chamber B would not occur for this proposed alternative.	Construct two new 48 from the proposed cha 48-inch pipes in Gou north.	3-inch diameter pipes amber to the existing alden Avenue going
Flow Meter Chamber C -	Construct underground	The construction of Flow	Construct undergrou	nd concrete vault
Would measure flow from the new Shaft Chamber to City Tunnel No. 1, Shaft No. 4 and City Tunnel No. 3, Shaft No. 4B	concrete vault containing one 48-inch diameter and one 84- inch diameter Venturi meter.	Meter Chamber C would not occur for this proposed alternative.	containing one 48-inc 84-inch diameter Vent pipelines.	ch diameter and one uri meter on existing
	2008-2011		2008-2011	
TABLE 6. OFF-SITE FACILITIES CROTON WTP WORK

Location	Eastview NCA	Eastview KCT	Mosholu	Harlem River
Flow Meter Chamber D -	Construct underground	The construction of Flow M	Meter Chamber D woul	d not occur for this
Would measure the flow from the	concrete vault containing one	proposed alternative.		
Shaft No. 21 to the South Bronx	48-inch diameter Venturi			
Low Level service connection	meter and connect to existing			
	48-inch pipelines.			
	2008-2011			
Valve Chamber A - Connects	Remove the existing 48-inch	No work is proposed for	Remove the existing	g 48-inch diameter
High Level service pipes to City	diameter interconnection and	Valve Chamber A for this	interconnection and bu	tterfly valve between
Tunnel No. 1, Shaft No. 4 and	butterfly valve between the	site alternative.	the 48-inch and 84-inc	h diameter pipes and
City Tunnel No. 3, Shaft No. 4B	48-inch and 84-inch diameter		replace with blind	flanges. Close the
	pipes and replace with blind		existing 48-inch dian	neter butterfly valve
	flanges. Close the existing		located on north side of	f chamber and install
	48-inch diameter butterfly		blind flange. Remove	a section of the 48-
	valve located on north side of		inch diameter pipe to	install the connection
	chamber and install blind		from the new Shaft (Chamber to the new
	flange. Remove a section of		Flow Meter Chamber	B and construct a
	the 48-inch diameter pipe to		bulkhead upstream of t	he connection.
	install the connection from			
	the new Shaft Chamber to the			
	new Flow Meter Chamber B			
	and construct a bulkhead			
	upstream of the connection.			
	2011-2014		2010	
Valve Chamber C - Contains	No work is proposed for Valve	e Chamber C; remove existing	section of each of the 4	8-inch diameter pipes
connections from Gate House No.	on the west side of the chambe	er and place a blind flange on	each to separate the dist	ribution system from
5 to the Low Level service of the	Gate House No. 5.			
East Bronx				
	2009 - 2010		1	
Jerome Pumping Station - Used	Place off-line.		Place off-line. Would	Place off-line.
to pump water to the Bronx			be used for NYCDEP	
Intermediate Level service area			staff offices	
	2010-2014			

2.5.1. New Croton Aqueduct

If the KCT tunnel would be chosen for the Eastview Site alternative, or if the Mosholu or Harlem River Sites were chosen, the NCA would be used for raw water conveyance to the water treatment plant. It would be used for overflows and an emergency supply to Jerome Park Reservoir if the water treatment plant were built at the Eastview Site. No work would be required at the shafts on the NCA. Almost all of the work described in this section would only take place if the Eastview Site would be chosen. If the NCA would be chosen to convey the water, work at the shafts described below would be required to pressurize the NCA. In addition, some work to treat the raw water at the 1890 Gate House at the Croton Lake Gate House site could be done if either of the water conveyance alternatives for the Eastview Site is selected. The only site described below that would require work for the Mosholu or Harlem River Sites is Gate House No. 1, which would require extensive renovation for the Mosholu Site. The level of effort at Gate House No. 1 is similar for the Eastview and Mosholu Site alternatives, but the work would take place prior to 2009-2010 for the Mosholu Site and after 2011-2015 for the Eastview Site.

Except as noted above for Gate House No. 1, the work described below would occur between 2010 and 2015. During this period the NCA would be out of service and finished water from the Croton WTP at the Eastview Site would be conveyed through the Interim connection described above to the Delaware Aqueduct. Current upstate suppliers that utilize the NCA would be provided with alternative supplies to prevent any disruption of services.

2.5.1.1. 1890 Croton Gate House

The 1890 Croton Lake Gate House is adjacent to the Croton Lake Gate House along the shoreline of the New Croton Reservoir, in the Town of Yorktown, to the east of the Croton Dam. The Croton Lake Gate House contains the flow control facility that releases water into the NCA. The 1890 Croton Lake Gate House contains facilities including chlorine and copper sulfate feeding systems to treat the raw water from the New Croton Reservoir.

If the Eastview Site is selected for the Croton WTP, potassium permanganate could be added at the 1890 Gate House at the Croton Lake Gate House site⁸. This chemical combines with iron and manganese and forms a solid that would be subsequently removed by the dissolved air floatation treatment process. This would only have to be done when the raw water contains elevated levels of these metals, which historically has occurred for a month or two every few years. The addition of potassium permanganate would be done at Gate House No. 5 if the water treatment plant were built at the Harlem River or Mosholu Sites.

The work at the 1890 Gate House involves adding several plastic bins and mixing equipment to the inside, replacing existing unused copper sulfate dosing equipment. The construction would

⁸ The current design plans to use anthracite as a filter medium. Evaluation during operations may indicate that granulated activated carbon may perform better. If this switch in filter mediums occurs it would be after 2011. Neither medium is toxic, they are similar in bulk, and there are no environmental consequences of the switch other than the need to apply occasional pretreatment with potassium permanganate as described in the text.

take two to three months. The work would be entirely interior work, and would involve only a few truck trips per day and fewer than ten workers. During operations the potassium permanganate would be delivered in dry form. Only two to three deliveries per year would be required. No environmental impacts are anticipated from this single action and no further analysis of the Croton Lake Gate House is included.

2.5.1.2. New Croton Aqueduct Shaft No. 9

NCA Shaft No. 9 is located in the Village of Sleepy Hollow, New York. The existing stone superstructure is approximately 42 feet by 44 feet and 22 feet tall. The superstructure extends approximately 20 feet below grade and contains a ladder for access from the ground level and a blow-off. The Pocantico blow-off is an existing NCA surge control mechanism. The Pocantico blow-off pipe (10 feet by 12 feet) connects to the NCA with gates and a weir wall. The blow-off outlet drains to Welker's Brook (also known locally as Carl's Brook), which flows into the Pocantico River a few hundred feet below the blow-off. The blow-off is currently partially sealed and not in operation.

The blow-off to the Pocantico River would be used more frequently if the WTP were to be at Eastview and the NCA is used for treated water because an unplanned shutdown of the raw water pumps at Eastview would cause a backup of water in the NCA. The potential environmental impacts of this release of raw water are discussed in the impact sections of the Final SEIS. No work would be required at this site if the KCT would be used for treated water conveyance.

2.5.1.2.1. New Croton Aqueduct Shaft No. 14

NCA Shaft No. 14 is located in the Village of Ardsley, New York and would serve as an access point into the NCA. The structure is approximately 40 feet below grade. The NCA passes through the structure and the blow-off pipe (10 feet by 12 feet) connects to the NCA with gates and a weir wall. The blow-off is currently not in operation. If the water treatment plant were built at the Eastview site, the blow-off and manhole covers would be sealed with pressure tight covers.

2.5.1.2.2. New Croton Aqueduct Shaft No. 18

NCA Shaft No. 18 is located in The City of Yonkers, New York. The shaft would serve as an access point into the NCA. The existing stone superstructure is approximately 40 feet by 43 feet and 20 feet tall. The structure extends approximately 19 feet below grade to the NCA. Tibbet's Brook runs perpendicular to the NCA and passes underneath the structure. The structure contains a blow-off with gates and a weir that allows water to flow from the NCA to Tibbet's Brook. Two 6-foot conduits below the superstructure convey the brook through the structure. The blow-off is currently not in operation. If the water treatment plant were built at the Eastview site, the blow-off and manhole covers would be sealed with pressure tight covers.

2.5.1.2.3. Gate House No. 1

Gate House No. 1 is located in the Croton Woods section of Van Cortlandt Park, Bronx, New York. Presently, Gate House No. 1 provides flow diversion and control functions for the NCA and the New Croton Branch Aqueduct, which originates at Gate House No. 1. Flow diversion and control at Gate House No. 1 is achieved using manually operated sluice gates on the NCA and stop logs on the New Croton Branch Aqueduct to direct flow into either or both of the aqueducts. Under current normal operations, the sluice gates on the NCA are kept closed and all water is diverted to the New Croton Branch Aqueduct and sent to the Jerome Park Reservoir, chlorinated and then discharged into the distribution system. The New Croton Branch Aqueduct is typically kept open whenever the Croton System is in service. Baseline Rehabilitation work is planned for this facility as a separate project to be completed prior to 2006 that would upgrade this facility to allow improved operation of sluice gates and security improvements irrespective of the selection of sites for the water treatment plant.

In the case of a water treatment plant at the Eastview Site and the continued utilization of the NCA for treated water, the sluice gates would have to be upgraded so that they would be pressure tight. No additional work would be required as part of this project at this site if the water treatment plant were built at the Harlem River Site. The sluice gates would have to be replaced and automated controls put in place if the Mosholu Site is selected.

2.5.1.2.4. New Croton Branch Aqueduct

The New Croton Branch Aqueduct is a horseshoe shaped 13.5-foot high by 13.6-foot wide non-pressurized grade tunnel that begins at Gate House No. 1 and continues southward parallel with the Old Croton Aqueduct to Gate House No. 7 at Jerome Park Reservoir. From there, the Old Croton Aqueduct and the New Croton Branch Aqueduct are both built into the east wall of the Jerome Park Reservoir. The New Croton Branch Aqueduct currently functions as the main source of raw water to the Jerome Park Reservoir.

The Branch Aqueduct would be sealed downstream of Gate House No. 1 if the WTP were built at Eastview and the NCA is pressurized. The Branch Aqueduct would be used to convey finished water from Shaft No. 21 on the NCA to the new shaft chamber near Jerome Park Reservoir. No work would be required along this conveyance if the water treatment plant were built at the Mosholu or Harlem River Sites.

2.5.2. Jerome Park Reservoir

Jerome Park Reservoir currently operates as a distribution reservoir for the Croton System. Jerome Park Reservoir is an open reservoir with a concrete bottom covering approximately 93 acres, formed principally of stone-masonry walls and earth embankment. The north wall is a concrete-faced earth embankment with a concrete core wall. The remaining walls are masonry with a 12 to 1 slope, and are approximately 30 feet high. A concrete dividing wall splits the reservoir into two basins. Gate House No. 5 is located at the east end of the dividing wall. Gate

House Nos. 3 and 6 are located in the south basin, and Gate House Nos. 2 and 7 are in the north basin.

As part of the proposed project, Jerome Park Reservoir would be used as a raw water reservoir if either the Mosholu or Harlem River Sites were chosen. If the Eastview Site were chosen, the Jerome Park Reservoir would be used for overflows (KCT treated water conveyance alternative only) and for an emergency supply (either treated water conveyance alternative). Irrespective of the choice of water treatment plant site, work is required to maintain the facilities around Jerome Park Reservoir. The work is the same for the two water treatment plant sites in the Bronx. Differences are noted below for the additional work required at Jerome Park Reservoir if the NCA would be pressurized.

2.5.2.1. Gate House No. 7

Gate House No. 7 is located along the northeast corner of Jerome Park Reservoir at the intersection of Sedgwick and Goulden Avenues, in the Bronx, New York City. Gate House No. 7 currently functions to control flow into the Reservoir from the New Croton Branch Aqueduct and can direct flow into the north basin. This gate house also includes a diversion to the Mosholu Pumping Station.

In the proposed project for all the site alternatives, Gate House No. 7 would be utilized to either control flow directly into the north basin of Jerome Park Reservoir or to allow water to continue through the New Croton Branch Aqueduct to the south basin. Gate House No. 7 would no longer discharge water to the Mosholu Pumping Station or continue to be used as the chlorination facility. Therefore, the electrical and chemical equipment and piping systems, all equipment from the switchgear rooms, and all of the screens would be removed. The superstructure would require interior and exterior rehabilitation and the sluice gates in the west portal of the north basin would be refurbished and automated.

The Mosholu Pumping Station is contained within the Gate House No. 7 complex. In the proposed project, the 75-year-old Mosholu Pumping Station would be taken off-line and all connections to the distribution system and the access pipe from Jerome Park Reservoir Gate House No. 7 would be plugged, sealed, and equipment would be removed. New piping and flow meters would connect the two Shaft No. 3, City Tunnel No. 1 risers with the two 48-inch diameter High Level Service transmission mains outside the gate house on Goulden Avenue.

The renovation work required for Gate House No. 7 would take place in 2010 for Mosholu and Harlem River and between 2010-2014 for the Eastview alternatives.

2.5.2.2. Gate House No. 5

Gate House No. 5 is located on the east side of the reservoir, near the intersection of Goulden Avenue and West 205th Street. Gate House No. 5 currently has multiple functions that include distribution control, a chlorination facility, a rescue skiff, offices and an employee lounge. It receives Croton water from the north and south basins of the Jerome Park Reservoir, through Gate House Nos. 2, 3 and 7 (via the New Croton Branch Aqueduct). Gate House No. 5 supplies Croton water to the NCA (via NCA Shaft No. 21), the south basin (via the south portal), the north basin, the East Bronx distribution system, and the Jerome Pumping Station.

As part of the proposed project, a potassium permanganate facility could be constructed within Gate House No. 5 for the water treatment plant at the Mosholu or Harlem River Sites if it were deemed necessary in the future. This would entail placing plastic bins and mixing equipment where some of the equipment that would have been previously removed as part of the hypochlorination project⁹. The interior and exterior of the structure would be refurbished for the Mosholu, Harlem River or Eastview sites using the NCA for treated water conveyance site alternatives.

Other proposed modifications associated to Gate House No. 5 for all site options include removing the 16-inch raw water connection from the Demonstration Plant and permanently sealing Chamber No. 22.

For the Eastview Site with the KCT option Gate House No. 5 would not continue to be used. All pipe connections to the City's distribution system would be sealed.

All work related to Gate House No. 5 is scheduled to take place in 2009-2010 unless the Eastview Site were chosen with the NCA as the treated water conveyance. In that case the work at Gate House No. 5 would take place during 2011-2014.

2.5.2.3. New Croton Aqueduct Shaft No. 21

NCA Shaft No. 21 is located in the north basin of Jerome Park Reservoir. NCA Shaft No. 21 currently connects Gate House No. 5 to the NCA. The Shaft functions as a conduit transferring water from the Jerome Park Reservoir into the NCA and provides Croton water to the Low Level Service areas of the Manhattan distribution system.

The proposed project has the NCA Shaft No. 21 direct raw water from the Jerome Park Reservoir to the proposed plant via the NCA to the Mosholu Site or the Harlem River Site alternatives. Minor rehabilitation work is probable but no modifications to the facility at NCA Shaft No. 21 are proposed at this time.

⁹ The NYDEP has committed to removing the existing gaseous chlorination equipment from Gate House No. 5 as part of its Risk Management Plan. This work is anticipated for 2004, prior to the start of the Croton WTP, and is being evaluated in a separate environmental review. It would be completed irrespective of the choice of sites for the Croton WTP. It involves removing the gaseous chlorine tanks and replacing them with liquid sodium hypochlorite equipment.

Shaft No. 21 would be used to divert finished water to the new shaft chamber via a short pipeline to the New Croton Branch Aqueduct for the Eastview Site alternative that uses the pressurized NCA.

All work related to the rehabilitation and upgrade of NCA Shaft No. 21 is scheduled to take place in 2009-2010.

2.5.2.4. Gate House No. 6 / Microstrainer Building

The Gate House No. 6 building and Microstrainer Building are located at the southern edge of the Jerome Park Reservoir at the intersection of Reservoir Avenue and Goulden Avenue.

As part of the proposed project, Gate House No. 6, which is not currently utilized, would be taken offline and the connections from the Gate House to the bypass piping and the two inlet pipes from the Jerome Park Reservoir would be plugged. Gate House No. 6 would be retained for NYCDEP use, but all of the operating equipment would be removed. The Microstrainer Building could be dismantled, and the area could be landscaped and kept open for a potential access road to the Reservoir.

The decommissioning and dismantling of Gate House No. 6 and the Microstrainer Building would occur in 2009-2010 for the Mosholu Site and Harlem River Site alternatives; 2011-2014 for the Eastview Site alternative.

2.5.2.5. Gate House No. 3

Gate House No. 3 is a one-story, 30-foot by 33-foot building located on the west side of the south basin of the reservoir. Its current function is to supply water to the south basin from Gate House No. 5 and allow Jerome Park Reservoir water to be circulated.

As part of the proposed project, Gate House No. 3 would continue to function as a water intake structure. The interior and exterior of the structure would be rehabilitated. Two 48-inch diameter gate valves to the distribution system would be removed and the operating stems would be cut. Concrete plugs at the gate valve intakes would be constructed. Gate House No. 3 would no longer be used for the Eastview Site with KCT option, in which case all pipe connections would be sealed.

This work would take place in 2009-2010 for the Mosholu Site and the Harlem River Site alternatives and between 2011 and 2014 for the Eastview alternative.

2.5.2.6. Gate House No. 2.

Gate House No. 2 is located in the north basin of the Jerome Park Reservoir. Gate House No. 2 consists of two components; a 40-foot by 35-foot main building that extends from the bedrock below the Reservoir floor to one story above the top of the Reservoir embankment.

Currently, Gate House No. 2 serves as the main drainage facility of the Jerome Park Reservoir and also functions as a north basin water supply source for Gate House No. 5.

In the proposed project, Gate House No. 2 would continue to serve as the main drainage facility for both basins of the Reservoir and supply water to Gate House No. 5. Similarly to Gate House No. 3, Gate House No. 2 would not serve as a water supply to Gate House No. 5 for the Eastview Site using the NCA for treated water conveyance. If the Eastview Site with NCA option is selected, connections from Gate House No. 2 to Gate House No. 5 would be sealed. A new overflow facility for the north basin would also be installed in Gate House No. 2. The interior and exterior of the structure would be rehabilitated. The 48-inch diameter gate valve to the distribution system would be closed and the operating stem would be cut. A concrete plug at the gate valve intake would be constructed A new overflow weir in Gate House No. 2 would be constructed to independently control water levels in the north basin

The rehabilitation work and the construction of the weir at Gate House No. 2 are scheduled to take place in 2009-2010 for the Mosholu Site and Harlem River Site alternatives and between 2011 and 2014 for the Eastview NCA alternative. This work would not take place if the Eastview Site with KCT option were selected.

2.5.2.7. New Shaft Chamber and Tunnel

In the proposed project a new Shaft Chamber would be constructed in Harris Park Annex north of Gate House No. 5, west of Goulden Avenue. The new Shaft Chamber would provide a central point for distributing treated water to the High Level and Low Level services.

The construction of the new chamber would not occur for the Eastview site with the KCT option. It would only be built as part of the Mosholu Site project or the Harlem River Site project or if the Eastview Site, with NCA, were to be selected.

If the Eastview Site alternative were selected, the use of the NCA for treated water conveyance. The New Shaft Chamber would convey High Level treated water via two 48-inch diameter pipes to City Tunnel No. 1, Shaft No. 3; a 48-inch diameter pipe to City Tunnel No. 1, Shaft No. 4; and an 84-inch diameter pipe to City Tunnel No. 3 via Shaft No. 4B. High Level treated water would also be conveyed from the new Shaft Chamber to the Low Level system through sleeve valves. A new 48-inch diameter pipe would be constructed from the new Shaft Chamber to the existing Valve Chamber C, to deliver Low Level treated water to the East Bronx. An additional Low Level 144-inch diameter connection would be made from the new Shaft Chamber to the NCBA, to provide service to Low Level Manhattan and South Bronx. High Level water would be supplied from the NCA through a 126-inch diameter connection the NCA to the New Shaft Chamber.

For the Harlem River Site alternative, treated water would be conveyed from the water treatment plant to the distribution system via a nine (9) foot diameter tunnel carrying High Level treated water. The New Shaft Chamber would contain a riser pipe that would connect to a 96-inch manifold in the chamber. Two 48-inch diameter pipes would discharge into the High Level system through City Tunnel No. 1 at Shaft No. 3. The 96-inch diameter pipe manifold would

also connect to two new pipes, a 48-inch diameter pipe (servicing City Tunnel No. 1 via Shaft No. 4) and an 84-inch diameter pipe (servicing City Tunnel No 3 via Shaft No. 4B).

The construction of the new Shaft at this location would be done using the raised bored construction method. This method involves drilling of a pilot hole from the surface. A boring drill rig would be assembled at the bottom of the shaft where the tunnel would terminate, and turned by a machine at the top. The boring spoils would fall into the tunnel, and would be removed as the drill is raised from the bottom of the Shaft. Using the new tunnel for access, all the debris would collapse into the new tunnel and would be removed at the water treatment plant site for either the Mosholu Site or the Harlem River Site alternatives. For the Eastview Site, the material would be removed through the NCA from shafts upstream of the Reservoir. This method would reduce the impact caused by construction in the area.

The drilling of the New Shaft via raised bore construction would take place in the first summer of the scheduled construction period. The new tunnel lining would be installed before the New Shaft Chamber construction commences. Construction of the New Shaft Chamber would occur during the school year with the concrete pours taking place during the summer months, Saturdays, or holidays to avoid disturbance of the nearby schools while they are in session. The construction of the New Shaft Chamber would be simultaneous with setting the piping in the New Tunnel from either the water treatment plant or the NCA, depending on the site selection, to the New Shaft Chamber.

Distribution to the High Level service would receive priority during normal operation for the Eastview (with NCA) and Harlem River Site alternatives. The Low Level service would be supplied through the High Level service via existing regulators dispersed through the system. For the Mosholu site, both High and Low Level services would be supplied from the new Shaft Chamber.

This work is expected to be completed during approximately two seasons per year from 2008 through 2011, before the scheduled plant start-up date.

2.5.2.8. Flow Meter Chambers

Other work related to the construction of the New Shaft Chamber includes the construction of at most four Flow Meter chambers in Jerome Park Reservoir area. These meter chambers would not be needed if the Eastview with KCT alternative were selected.

For the Eastview with NCA and Harlem River site alternatives, Flow Meter Chamber A would be constructed to measure the flow from the new Shaft Chamber to the East Bronx Low Level service connection. The same Flow Meter Chamber would measure the flow from the new Shaft Chamber to the East Bronx and South Bronx Low Level service connections for the Mosholu site. The proposed chamber would be an underground concrete vault containing a single 48-inch diameter Venturi meter and would be located approximately 300 feet north of Gate House No. 5 beneath Harris Park Annex.

Flow Meter Chamber B would be constructed to measure the flow from the new Shaft Chamber to City Tunnel No. 1, Shaft No. 3 High Level Service. The proposed chamber would be an underground concrete vault containing two 48-inch diameter Venturi meters and would be located approximately 480 feet north of Gate House No. 5 beneath Goulden Avenue.

Flow Meter Chamber C would be constructed to measure the flow from the new Shaft Chamber to City Tunnel No. 1, Shaft No. 4 and City Tunnel No. 3, Shaft No. 4B High Level Service. The proposed chamber would be an underground concrete vault containing one 48-inch diameter and one 84-inch diameter Venturi meter and would be located beneath the intersection of Goulden Avenue and W. 205th Street.

Flow Meter Chamber D would be constructed to measure the flow from the Shaft No. 21 to the South Bronx Low Level service connection only for the Eastview site with NCA alternative. The proposed chamber would be an underground concrete vault containing a single 48-inch diameter Venturi meter. The proposed Flow Meter Chamber D would be located in the JPR near the existing butterfly valve at the dividing wall, which connects to the South Bronx Low Level service for the Eastview site.

This work is associated to the construction of the New Shaft Chamber. The construction of the proposed New Flow Meters would take place seasonally from 2008 through 2011 with excavation of the New Flow Meter chambers taking place in the second summer of construction. The construction of the Flow Meter chambers would occur during the second school year with concrete work performed on Saturdays and school holidays.

2.5.2.9. Jerome Pumping Station.

The Jerome Pumping Station is located on Jerome Avenue between Mosholu Parkway and West 205th Street in the Bronx. The pumping station was built in 1906 to house steam driven pumps, which were replaced in 1938 by three 19 mgd electric pumps that are capable of delivering 50 mgd of water to the Bronx Intermediate Level Service. The pumping station superstructure is a three-story building, but only the main floor is at grade. The basement and mezzanine levels are below grade. The basement level contains pumps, motors, and piping. The mezzanine level contains electrical switchgear. Jerome Pumping Station currently pumps water from Jerome Park Reservoir to the Intermediate Level service area.

In the proposed project, the Intermediate Level service would be supplied from the in-City High Level Service using existing pressure reducing valves and regulators for all site alternatives. The Jerome Pumping Station would no longer be needed and would be taken off line, but would be retained for BWSO use. All the mechanical equipment, suction mains and discharge mains would be capped at the face of the building. A portion of the water treatment plant staff may occupy the Jerome Pumping Station. Other future uses of the Jerome Pumping Station would be the subject of further study.

The work required to place the Jerome Pumping Station off-line is expected to take place between 2011-2014 for the Mosholu Site and all of the alternatives.

2.6. CONSTRUCTION SCHEDULES AND COST ESTIMATES

The Supplemental Consent Decree stipulates plant operation on or before October 31, 2011 for the Harlem River and Mosholu Sites, and September 30, 2010 for the Eastview Site. Some mitigation work would occur before the WTP construction. The award of construction contracts would be timed to expedite completion of the project, but construction would be phased to minimize siting conflicts. Anticipated timetables for the major items of the construction plan are presented in Figure 12.

The estimated capital, operating and life cycle costs (and increases to water/sewer rates) for the project are presented in Table 7. All costs are presented in 2003 dollars unless noted otherwise. Four cost scenarios are presented in the following comparative cost table for the three sites under consideration. The Eastview Site is represented by two scenarios, one using the (KCT for the treated water conveyance and the second using a pressurized NCA to convey the treated water. A portion of the KCT construction costs are allocated to the Croton WTP based on the percentage of total aqueduct capacity that could be represented by the Croton water.

The costs include approximate values for land acquisition for the Harlem River Site, and mitigation and amenities costs. The mitigation and amenities costs for the Mosholu Site are more fully developed than the costs at the other sites, but estimates are included for natural resources, visual improvements, and local improvements to the transportation networks.

The costs are based on a 2.75 percent annual inflation rate, a 6.4 percent interest rate on the capital, and a 30-year term on the debt. These are the assumptions that NYCDEP uses for modeling its capital improvements. All these costs are based on conceptual design. A contingency is included for the costs not captured at the conceptual level. The costs would be reported again based on preliminary design in the Final SEIS. The projected impacts on water rates are in Table 8.

ID	Task Name	Start	Finish	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	EASTVIEW SITE	Mon 9/5/05	Wed 10/26/11								-	E									
2	Raw Water Tunnel	Mon 9/4/06	Wed 5/28/08	1																	
3	WTP and Pump Station	Mon 9/5/05	Fri 2/26/10	1		-	-		-	ո											
4	Startup and Testing	Mon 3/1/10	Thu 9/30/10	1						Ť.											
5	Facilities at Jerome Park	Thu 7/30/09	Wed 10/26/11]						:											
6	NCA Aternative	Mon 9/4/06	Tue 9/29/15	1		•															
7	Treated Water Tunnel	Mon 9/4/06	Wed 5/28/08	1			-														
8	Facilities at Jerome Park	Thu 12/1/11	Mon 4/1/13																		
9	Shaft Sites	Thu 12/1/11	Tue 9/29/15	1																	
10	KCT Alternative	Mon 6/1/09	Mon 1/20/20	1					-		:										
11	Construction	Mon 6/1/09	Mon 1/20/20	1						:	:	:	:	:	:	:	:	:	:		
12																					
13	MOSHOLU SITE	Thu 8/5/04	Mon 10/31/11	-																	
14	Traffic mitigation	Thu 8/5/04	Fri 9/30/05																		
15	Site Preparation	Wed 4/13/05	Tue 4/10/07	1		:															
16	Raw and Treated Water Tunnel	Fri 7/1/05	Thu 6/25/09	1																	
17	WTP and Pump Station	Wed 3/1/06	Tue 3/22/11	1			-				ահ										
18	Startup and Testing	Wed 3/23/11	Mon 10/31/11	1							1										
19	Facilities at Jerome Park	Thu 7/30/09	Wed 10/26/11																		
20				1																	
21	HARLEM RIVER SITE	Thu 3/31/05	Mon 10/31/11	1							-	E .									
22	Site Preparation	Thu 3/31/05	Fri 3/31/06	1		ļ.															
23	Raw and Treated Water Tunnel	Mon 9/4/06	Wed 5/28/08	1	-		-		ł					-			ł	-	-	-	
24	WTP and Pump Station	Mon 9/5/05	Tue 3/22/11			-	-				իր										
25	Startup and Testing	Wed 3/23/11	Mon 10/31/11	1				-			5										
26	Facilities at Jerome Park	Thu 7/30/09	Wed 10/26/11	1							:										

FIGURE 12. WATER TREATMENT PLANT CONSTRUCTION SCHEDULE

Capital Costs	Eastview with KCT	Eastview with NCA ¹	Mosholu	Harlem River					
Construction Costs, 2003 ⁴ \$million	\$1,546	1,196	\$992	1,174					
Estimated Mitigation/Attenuation 2003 \$ million	\$23	\$23	\$43	\$11					
Amenities 2003 \$ million	\$28	\$28	\$200	\$30					
Total Capital Costs 2003 \$million	\$1,597	\$1,247	\$1,235	\$1,215					
Annual Operating Costs, 2003 \$million	\$33	\$33	\$22	\$25					
Life Cycle Costs, 2003 \$million	\$1, 814	\$1,521	\$1,352	\$1,378					

TABLE 7. SUMMARY OF COST ESTIMATES (\$2003 MILLION)

Notes:

¹NCA as the finished water conveyance. Includes \$558,000,000 cost of aqueduct pressurization plus \$125,000,000 for the Treated Water Tunnel.

² Kensico-City Tunnel. This is a proposed new City Water Tunnel to connect Kensico Reservoir, the Eastview Site, and the Van Cortlandt Valve Chamber. The New Croton Aqueduct would only be used for plant overflows.

³ The Mosholu Design requires a passageway around the perimeter of the underground WTP to move equipment that is accomplished at the other sites by an exterior roadway.

⁴ Costs are based on 2.75% inflation, 6.4% interest, and 30-year life cycle. All costs are from Conceptual Designs. Estimates of amenities and mitigation costs are included. Baseline NCA rehabilitation is not included

TABLE 8. POTENTIAL IMPACTS ON WATER AND SEWER RATES

	Eastview with KCT ¹	Eastview with NCA ²	Mosholu ³	Harlem River ⁴
Combined Water and Sewer Rate increase, NYC users (% increase over 2016 base rate, \$1,066)	\$45 (4.2%)	\$52 (4.9%)	\$44 (4.1%)	\$46 (4.3%)
Uniform Water Rate increase, upstate users (% increase over 2016 base rate, \$116)	\$39 (33.6%)	\$47 (40.5%)	\$0 (0%)	\$0 (0%)

Notes:

1. Including \$28 million amenities package and using a 4% tax inflator.

^{2.} Not including amenities package (since \$558,000,000 cost of aqueduct pressurization plus \$125,000,000 for the Treated Water Tunnel is included) and using a 4% tax inflator.

^{3.} Including \$200 amenities package.

^{4.} Including \$30 amenities package.

3. SUMMARY OF POTENTIAL SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

3.1. INTRODUCTION

This section summarizes the potential significant adverse environmental and public health impacts and where necessary and feasible or practicable, mitigation measures. Potential adverse impacts that would not be considered significant are described in the detailed sections within the Final SEIS. Detailed methods of analysis are presented in the Final SEIS. For each of the parameters that were studied, the Existing Conditions were assessed. These assessments included traffic counts, collection of air quality data, noise monitoring at the site and at adjacent businesses, homes or parks (sensitive receptors). Interviews with schools and other community facilities were gathered, as were census data on the local socioeconomic conditions. Photographs of views, and samples of water and river bottom were collected. When all this information was gathered, the values for each of these parameters were predicted for the peak year of construction and the year of operation. This is termed "Future Without the Project," or "No-Build Year." Then, the project-induced impacts for the peak year of construction and the year of operation were developed to create a scenario of the "Future With the Project," or "Build Year." The impacts for both construction and operation were assessed by subtracting (or comparing for non-quantitative parameters) the Future With the Project with the Future Without the Project. Thresholds to determine significance were compared with established environmental impact criteria as published by New York City in the CEQR Technical Manual updated in 2001, and compared with relevant criteria published by the communities in Westchester County, as described in the Methodology section of the Final SEIS.

It should be noted that as the conceptual design evolved, many features have been incorporated based on engineering judgment and previous experience with the design of this project. For example, the project alternative at the Harlem River Site includes public access to the waterfront, even though that access is not required in a Manufacturing Zone. This access was added to avoid any potential conflict with waterfront plans. These sorts of project components are not specifically called out as mitigation, but they do avoid potential impacts. Significant impacts that cannot be fully avoided or mitigated are also described. Details of these potential impacts, and the explanations and descriptions of the environmental impact categories that were analyzed, are provided in the Final SEIS.

Below is a listing of potential adverse and significant adverse impacts that may occur, despite the attempts to avoid or minimize them during design. Where feasible, mitigation is proposed. It should be noted that construction-related impacts are not generally classified as significant because of their temporary nature. They are, because of the 5.5-year construction duration of this project, quantified and identified below along with mitigation measures wherever possible.

The potential adverse or significantly adverse impacts of the proposed project alternatives are divided in the following pages into first those impacts associated with the water treatment plant sites and then at the offsite facilities, including the NCA sites and Jerome Park Reservoir. If mitigation is called for to reduce potentially significant impacts it is described along with the impacts.

3.2. POTENTIALLY SIGNIFICANT ADVERSE IMPACTS AND MITIGATION AT THE EASTVIEW SITE

3.2.1. Introduction

Avoidance of potential environmental impacts would be an integral part of the construction plans. For example, a vibration prevention/monitoring program would be implemented during construction. Similarly, paving of some interior construction roadways and dust suppression techniques are incorporated in construction plans to eliminate air and noise quality nuisances to the extent feasible and practicable. Stormwater management both during construction and operations would be provided to prevent the release of particulate material into the nearby Mine Brook.

There would be no significant or adverse impacts to Land Use, Zoning and Public Policy, Visual Character, Community Facilities, Open Space, Archaeological Resources, Socioeconomic Conditions, Air Quality, Growth Inducement, Hazardous Materials, Water Resources, Infrastructure and Energy, Electromagnetic Fields/Extremely Low Frequency Fields, Solid Waste, or Public Health as a consequence of the construction and operation of the Croton water treatment plant at the Eastview Site. If the pressurization of the NCA is chosen as the long-term treated water conveyance, the work required to facilitate the pressurization of the NCA would result in a significant impact to the historic character of the Aqueduct. Neighborhood Character could be affected by traffic congestion and mobile noise as a result of construction with both the Croton WTP and the Cat/Del UV Facility under construction at the Eastview Site at the same time. Adverse environmental impacts identified within the Final SEIS are summarized by parameter below.

3.2.2. Traffic and Transportation

With a 1.7-mile distance to the nearest major highway, construction of the proposed project at the Eastview Site would result in a widespread traffic impact. The summary below presents the worst case conditions and assumes that the construction and operation of the Croton project would overlap with the construction and operation of the Cat/Del UV facility. To reduce impacts during construction, four different off-site parking alternatives were analyzed. Section 9.1.3 provides an alternative scenario in which the Croton project would be the only major project constructed at the Eastview and it presents all the construction parking alternatives.

3.2.2.1. 2010 Potential Project Impacts and Mitigations

The traffic analyses compared the proposed Croton Facility's 2010 Build conditions with 2010 Future Without Project conditions with the Cat/Del UV project. Under these conditions in 2010, it was found that traffic from the Croton Facility would be anticipated to result in three significant traffic impacts, two during the AM peak hour and one during the PM peak hour. These impacts could be fully mitigated as described below.

Specific measures are recommended for each location that would be impacted. For many of the locations, more than one measure was identified that could be implemented that would reduce delays back to or below Future Without Project conditions. The assessment presented here relies on a combination of new traffic signals, lane stripping changes, and traffic signal retiming or phasing changes as the recommended measures. Once the Croton project is built and operational, the various agencies responsible for maintaining traffic flow and roadways in the study area would conduct field inspections of the operations of the various intersections to determine if the proposed mitigation measures are actually warranted (particularly because traffic from anticipated No Build projects or background growth may be less than analyzed in this report).

3.2.2.1.1. Old Saw Mill River Road and Saw Mill River Road (Route 9A) SB Ramps

During the AM and PM peak hour, the northbound left-turn movement would continue to operate at Level of Service (LOS) F, with delays increased to beyond 240 seconds. This impact could be fully mitigated with the installation of a traffic signal at this location. As a result of this mitigation, the northbound left-turn movement would improve compared to Future Without Project conditions, to LOS C, and all of the other movements and approaches would operate at LOS C or better.

Although traffic from the Cat/Del UV Facility would not result in a significant adverse impact at this location during the AM peak hour, operations were evaluated with the new traffic signal. The analysis shows that delays would improve substantially with the installation of the traffic signal required as mitigation for the PM peak hour impact, resulting in all movements and approaches operating at LOS C or better, during the AM peak hour.

3.2.2.1.2. Grasslands Road (Route 100C) and Sprain Brook Parkway Northbound Ramp

During the AM peak hour, the northbound left/through movement would continue to operate at LOS F, with a 7.9-second increase in delay. A shift of 1 second of green time from the east-west signal phase to the northbound phase would fully mitigate this impact. As a result of this mitigation, the northbound left/through movement would improve compared to Future Without Project conditions, to LOS F (80.3 seconds of delay), and the northbound right-turn movement would improve compared to Future Without Project conditions, from LOS F to LOS E. All other approaches and lane movements would operate at LOS C or better.

For locations where the installation of a new traffic signal has been recommended as a mitigation measure, formal Signal Warrant Studies would be performed, if requested by the agency(s) with jurisdiction over the particular intersection roadways involved.

All of the mitigation measures suggested above would serve to eliminate the significant adverse operational impacts of the proposed project. If the mitigation identified is not applied, the predicted significant adverse operational traffic impacts identified would not be mitigated. In the absence of implementing the mitigation measures proposed above, NYCDEP would consider other traffic management techniques (e.g., the use of traffic control officers, traffic cones,

variable message signs, etc.) if approved by the governing roadway entity, to offset these significant adverse impacts, and ensure the smooth and safe operation of traffic.

3.2.2.2. 2008 Potential Construction Impacts and Mitigations

For the analysis scenario with the Cat/Del UV project under construction, four different construction worker parking Options have been considered, resulting in four distinct 2008 Construction with Croton conditions (Options A, B, C, and D). This is because with the proposed Croton project and the Cat/Del UV Facility under construction at the Eastview Site concurrently, there would not be enough space on-site for all of the workers for both projects to park, as most of the available land area would either be under construction, or in use as construction lay-down or staging areas. These construction worker parking Options have been selected for analysis purposes, as representative of the types of routings that worker vehicles would use for off-site parking. As described in the traffic analyses (Section 4.9, Traffic and Transportation) each of the four construction worker parking Options also included an additional assignment for shuttle buses that would transport the workers between the Eastview Site and the off-site parking areas.

It is important to note that these 2008 Construction (Options A through D) conditions reflect the maximum number of worker trips that would be anticipated at the peak of the concurrent construction of the Cat/Del UV Facility and the proposed Croton project. During other times during the 6-year overlapping construction period, the numbers of total workers traveling to and from the Eastview Site would be substantially lower than for peak conditions in 2008. During these times with fewer workers, the impacts would be less than those discussed below, and would be likely to occur at locations similar to conditions outlined for Option A, because the workers would be able to park right at the Eastview Site, and the routing of those trips would be very similar to the routing examined for Option A.

The four construction worker parking Options that were analyzed are described below:

- *Option A:* All of the construction workers for both the Cat/Del UV Facility and the proposed Croton project would park at the Landmark at Eastview office park (Landmark property), west of the project site, and would be shuttled to the site in buses or vans.
- *Option B:* All of the construction workers for both the Cat/Del UV Facility and the proposed Croton project would park at the Westchester Community College (WCC) Campus, east of the project site, and would be shuttled to the site in buses or vans.
- *Option C:* Parking for all of the construction workers for both the Cat/Del UV Facility and the proposed Croton project would be split evenly between the Landmark property and WCC, and would be shuttled to the site in buses or vans.
- *Option D:* All of the construction workers for the proposed Croton project would park at the Landmark property, west of the project site, and all of the construction workers for the Cat/Del UV Facility would park at the new Home Depot off Dana Road, just northwest of the project site. Rather than simply splitting the workers between the two sites, workers from the Cat/Del UV Facility were assigned to the Home Depot site

because the property owner indicated that they anticipated that the parking that would be available would be just enough to accommodate the projected number of UV Facility construction worker vehicles, but would not be sufficient to accommodate the projected number of proposed Croton project worker vehicles. All workers for either project would be shuttled to the site from their respective parking areas in buses or vans.

The potential impacts during the construction period vary depending on the choice of parking option. The detailed impacts for each parking option and the proposed mitigation for each option are described in Section 9.1.3. Up to 27 significant adverse impacts could occur at up to 15 intersections during the construction period (Option B) if the Cat/Del facility were under construction at the same time.

For locations where the installation of a new traffic signal has been recommended as a mitigation measure, formal Signal Warrant Studies would be performed, if requested by the agency(s) with jurisdiction over the particular intersection roadways involved.

All of the mitigation measures suggested in Section 9.1.3 would serve to eliminate constructionrelated impacts of the proposed project. If the mitigation identified were not applied, the predicted significant adverse construction traffic impacts identified would not be mitigated. In the absence of implementing the mitigation measures recommended above, NYCDEP would consider other traffic management techniques (e.g., the use of traffic control officers, traffic cones, variable message signs, etc.) if approved by the governing roadway entity, to offset these significant adverse impacts, and ensure the smooth and safe operation of traffic.

3.2.3. Noise

Constructed-related activities could result in adverse impacts. Since the noise-related impacts would either only negatively affect non-sensitive receptors in the vicinity of the site or are short-term, respectively, no specific noise reduction measures are proposed to be implemented as part of the proposed project.

3.2.4. Natural Resources

Construction-related activities for the proposed project would result in 494 trees being cut and 214 being threatened. In addition to the trees and vegetation being lost approximately 0.2 freshwater wetlands would be lost. This loss includes the permanent loss of an approximately 0.1 acre isolated wetland in the northwest portion of the site and the temporary impact to approximately 0.1 acres of wetland during the construction of the conduit connecting the treated water from the proposed plant to the Delaware Shaft No. 19. It should be noted that a majority of the vegetation to be removed from the site by the proposed project would be multiflora rose, an invasive species, which does not provide valuable habitat for the region. In addition, a majority of the trees that would be removed as a result of the proposed project are not part of a the most valuable forest system within the site, but are found spread throughout the multiflora rose field in the northwestern portion of the site. A combination of on-site and off-site mitigation is proposed for this the potentially significant adverse impacts on natural resources.

3.2.5. Historic and Archaeological Resources

The connections planned to the NCA to and from the proposed plant would potentially alter the historic character of the aqueduct, which is eligible for possible inclusion on the National Register of Historic Places. The pressurization of the NCA would permanently alter the character of this resource. This would be a significant impact to historic resources. Consultation on the appropriate level of mitigation would be undertaken with the New York State Office of Parks, Recreation and Historic Preservation (OPRHP).

3.3. POTENTIALLY SIGNIFICANT ADVERSE IMPACTS AND MITIGATION AT THE MOSHOLU SITE.

3.3.1. Introduction

It should be noted that as design evolved, many features have been incorporated based on engineering judgment and public input. For example, the proposed project at the Mosholu Site would be built substantially below existing grade and fully covered, allowing the replacement and enhancement of existing park uses. The costs of burying the proposed facilities, relocating the existing golf club house, replacing the existing driving range, rebuilding and enhancing the existing golf course, and landscaping are all included in the project design. A vibration prevention/monitoring program would also be implemented during construction. An ornamental wall could be placed along the construction boundary to screen the view of the construction site. Similarly, to the extent possible, noise barriers and paving of interior construction roadways and dust suppression techniques are incorporated in construction plans to eliminate nuisances to the extent feasible and practicable. Finally, some of the planned improvements to traffic conditions would represent mitigation of impacts, but planned improvements to the entrance to the Mosholu Golf Course would be incorporated into the project plan despite the lack of predicted impacts based on the traffic analysis.

The Final SEIS analyses demonstrate that there would be no significant adverse impacts associated with the proposed project at the Mosholu Site for Land Use, Visual Character, Community Facilities, Neighborhood Character, Air Quality, Open Space, Historic and Archaeological Resources, Socioeconomic Conditions, Growth Inducement, EMF/ELF, Hazardous Materials, Infrastructure and Energy, and Solid Waste.

Below is a listing of potential significant impacts that may occur, despite the design considerations discussed above. Where feasible and practicable mitigation would be proposed.

3.3.2. Traffic

The need for potential traffic improvements for the proposed plant at the Mosholu Site was based on an analysis of the potential for significant adverse traffic impacts in Section 6.9.3, Mosholu Site, Traffic and Transportation, Potential Impacts. The potential traffic improvements for the water treatment plant site are described as follows: No significant traffic impacts are anticipated during the operation of the proposed facility. However, the construction phase of the proposed project is anticipated to result in traffic impacts at the 233rd Street and Jerome Avenue and Jerome Avenue and the Mosholu Golf Course entrance. A plan has been developed that would require all the construction related truck traffic to use the Major Deegan Expressway 233rd Street exit, and travel south along Jerome Avenue to enter the site. Construction truck traffic exiting the site would be required to travel north along Jerome Avenue to 233rd Street. Combined with the improvements proposed at 233rd Street/Jerome Avenue and the 233rd Street off-ramp of the Major Deegan Expressway, this designated truck route plan is projected to improve current congested conditions and eliminate the potential for the proposed project to adversely affect this intersection.

In order to maximize capacity of these intersections, and to mitigate the potential impacts of the construction traffic and the Future with the Project traffic, the following mitigations measures are recommended and would be committed to by the NYCDEP to be part of the project at the Mosholu Site. Each of these intersection mitigation plans would be based upon the potential construction impacts that would occur during peak construction periods even with the proposed mitigation plan.

It should be noted that the following proposed mitigation plans contemplate the re-apportioning of the "green light time" for critical approaches at different intersections in the study area. This measure is intended to improve the overall intersection LOS and delay in certain intersection. These plans will improve the LOS and reduce delays back to the Future Without the Project conditions. However, in some cases these improvements might actually worsen other approaches to the same intersection (i.e., increase delay or worsen LOS) but overall would improve the intersection conditions and LOS.

1. East 233rd Street/Jerome Avenue: The analyses, as well as field inspections, show that there is severe traffic congestion at this location that will worsen with or without the proposed project. Although there is a right-turn channel at Jerome Avenue, queuing prevents vehicles from utilizing the channel because it is located too close to the intersection. This problem can be resolved by widening the ramp, to provide an exclusive, temporary right-turn lane leading into the existing channel. This would allow right-turning vehicles to clear the ramp quickly and also improve the overall queuing condition on this ramp. Since this area was included as part of the alienation legislation authorizing the use of the Mosholu Golf Course as a site for the Croton WTP, if the New York City Department of Parks and Recreation (NYCDPR), New York City Department of Transportation (NYCDOT), and the community make an official request that NYCDEP make this improvement permanent, NYCDEP would endeavor to do so.

The southbound left-turn at this intersection has restricted capacity due to the high opposing volume. During PM peak conditions, field inspections have shown left turning drivers utilize one of the southbound through lanes as a second left turn lane. This illegal maneuver is allowing additional southbound lefts to get through the intersection then would otherwise occur with the current intersection configuration

and signal phasing. To improve the delay for southbound lefts, a left-turn signal phase would be added.

Another problematic approach at this intersection is the westbound left-turn movement on E. 233rd Street. As there are a limited number of east-west roadways in this area, many vehicles heading south use westbound E. 233rd Street and then make a left-turn at Jerome Avenue. The high number of vehicles and limited green signal time result in delays during rush hours. To address this problem, it is proposed to widen E. 233rd Street and to add a second left-turn travel lane on the westbound approach.

After the physical changes, a signal timing warrant analysis would be conducted and submitted to NYCDOT for review and approval to make the intersection more efficient.

2. Jerome Avenue and Bainbridge Avenue: Although this intersection is not predicted to result in potentially adverse impacts based on the traffic capacity analysis, it would be used as the primary site access. The existing entrance to Mosholu Golf Course is at a complex intersection where Jerome Avenue and Bainbridge Avenue join at an acute angle. There is limited sight visibility at this intersection because of the columns that support the elevated No. 4 IRT Woodlawn train station. Construction traffic would not likely choose to use Jerome Avenue for access from the south, but several steps would be taken to insure that truck traffic does not use this route. The existing entrance to Mosholu Golf Course would be converted to a one-way exit. The right turn would be marked "No Trucks." A new entrance would be created approximately 150 ft. north of the existing entrance. The northbound approach to this entrance would be marked "No Trucks." Finally, a Traffic Control person would be placed on duty at this intersection during peak traffic periods and to enforce the ban on project-generated truck traffic traveling to and from the south along Jerome Avenue. This would also enhance pedestrian safety.

These traffic improvements primarily call for optimizing signal timings to reduce the potential increase in delay created by construction traffic volumes. The construction volume peaks were predicted conservatively since they were anticipated to arrive during the AM and PM peak hours. The optimum signal timings utilized are approximate. It is routine for counts to be performed at these locations after construction begins to provide actual traffic patterns to support the request for the modification of the signal timings. The potential traffic improvements would be developed in accordance with NYSDOT and NYCDOT design guidelines for approval. In addition, the potential traffic improvement designs would need to be reviewed and approved by the NYSDOT, NYCDOT, and/or other roadway jurisdictional bodies prior to being implemented. If these signal optimization plans to reduce the predicted increases in delay at the intersections in the study area are not adopted, these adverse traffic impacts would remain unmitigated. The potential adverse impacts from the proposed construction-related activity would be short-term and mainly related to peak construction periods.

3.3.3. Noise

No significant mobile or stationary noise impacts were anticipated as a result of future normal operations of the proposed plant. Predicted construction-generated noise level increases generally exceed the acceptable 3-5 dBA noise increase threshold established by CEQR to define significant adverse noise level increases that would result from a proposed project. Noise sensitive receptors in the vicinity of the proposed water treatment plant at the Mosholu Site would be affected by these noise level increases at four sites (Saturn Playground, Mosholu Golf Course, Shandler Recreation Area, and residences at Jerome Avenue and 213th Street). These noise level increases would last long enough to constitute a significant adverse impact and, therefore, would warrant mitigation. Mitigation would be required due to the long construction period and the potential for subsequent lost enjoyment for the Van Cortlandt Park users and prolonged nuisance from noise that may occur to residential receptors and elsewhere. Woodlawn Cemetery (MGC-S4) may also experience some increased noise levels during the excavation and rock drilling phases of construction. However, the short duration of the noise level increases would be temporary and therefore not significant.

Measures to mitigate potential construction-generated noise impacts at sensitive receptors in the vicinity of the water treatment plant at the Mosholu Site were studied. For each noise-sensitive receptor, predicted project-induced noise levels for the peak construction-noise year (2006) were compared to the predicted future baseline noise levels for 2006. For those receptors that would experience a significant impact, attenuation measures were identified and the noise level at sensitive receptors following implementation of mitigation was estimated.

3.3.3.1. Mobile Source Noise

No significant noise impacts are anticipated from mobile sources as a result of operation or construction at the water treatment plant site. The results of the potential proposed plant operations and construction impacts analysis are presented in Section 6.10. Mitigation measures were not required along noise sensitive route segments.

3.3.3.2. Stationary Source Noise

Mitigation measures required for stationary noise impacts at sensitive receptors were analyzed. Table 9 presents information regarding the sensitive receptors.

Receptor Name	Description of Receptors
MGC-S1	Saturn Playground (Van Cortlandt Park)
MGC-S2	Mosholu Golf Course (west of proposed construction zone)
MGC-S3	Shandler Recreation Area (Van Cortlandt Park)
MGC-S4	Woodlawn Cemetery
MGC-S5	Residences at intersection of West Gun Hill Road and Jerome Avenue
MGC-S6	Residences at intersection of Jerome Avenue and 213 th Street

TABLE 9. DESCRIPTION OF NOISE SENSITIVE RECEPTORS FOR STATIONARY NOISE SOURCE ANALYSIS

Predicted noise levels resulting from construction activities would produce increased noise levels requiring mitigation at receptors MGC-S1, MGC-S2, MGC-S3, and MGC-S6. Significant adverse impacts were anticipated only during weekday construction hours (7:00 AM – 6:00 PM). As discussed in Section 6.10, the residences to the south of the site at the intersection of Jerome Avenue and East Gun Hill (MGC-S5) were not considered in the construction-noise impacts. Saturn Playground (MGC-S1) is located to the south of the site and between the site and MGC-S5. It was assumed that if potentially significant adverse impacts from construction noise were mitigated for MGC-S1, which is much closer to the site than MGC-S5, then the impacts also would be mitigated for MGC-S5.

An analysis was performed to determine what equipment used at what times was responsible for producing the greatest incremental change in noise levels. The maximum noise levels from construction activities would occur during the early phases of the construction period (from approximately April 2006 until July 2007). This period corresponds with earth excavation and removal activities at the site. Equipment most responsible for the increased noise levels would be the rock drills and the large volume of excavators and trucks that would be on site during that period. However, noise levels would exceed the 3-5 dBA threshold used to define significance for the duration of the construction schedule at some receptors (MGC-1, MGC-S2, and MGC-S3).

Site contractors would be required to mitigate construction noise to acceptable levels at each receptor in the vicinity of the Mosholu Site. Required standards to which contractor must adhere are those minimum standards of acceptability as established by the NYC Noise Code and as prescribed by CEQR. The precise mitigation methods employed by the contractor to adhere to acceptable levels would be left to their discretion (subject to NYCDEP review and approval). The following discussion, however, presents some of the more common mitigation techniques that may be employed to reduce noise to acceptable levels.

Noise attenuation systems that would mitigate the noise impacts from construction activities at sensitive receptors neighboring the site were identified. Receptors experiencing significant impacts are predicted to be on all sides of the site. The most affected receptor would be Mosholu Golf Course immediately to the west of the site (MGC-S2). Noise barriers facing the potentially impacted receptors would be installed at fixed locations along the boundaries of the construction site. Noise barriers placed in a fixed location would not restrict the movement of on-site workers and equipment during construction.

The exact amount of sound transmission loss from a barrier is a function of its height, thickness, material of construction, and precise location with respect to the noise source and noise sensitive receptor. The barriers would act as an acoustical curtain enclosure, effectively shielding the receptors from noise emanating from construction equipment. A barrier approximately 20 feet in height would minimize the noise reaching sensitive receptors due to absorption and diffraction (i.e., bending of the sound waves over the top of the barrier). This type of noise barrier could achieve approximately 13 dBA of sound transmission loss (again, depending on the variables listed above).

The greatest predicted noise level increase due to construction would be 24.5 dBA above the CEQR threshold at receptor MGC-S2. Additional mitigation requirements for this receptor will be discussed in greater detail below. The other receptors (MGC-S1, MGC-S3, MGC-S4, and MGC-S6) each would experience noise level increases ranging from 4.5 dBA to 14.3 dBA above the CEQR threshold. The noise barrier would be capable of attenuating approximately 13 dBA of noise. With the noise barrier in place, the total predicted noise level during construction at MGC-S3 (which is the receptor that may experience 14.3 dBA increase) would be approximately 59.5 dBA. This level represents a 6.1 dBA increase over the lowest Future Without the Project level at this receptor and a 1.3 dBA over the CEQR threshold. As discussed below, additional mitigations, such as barriers and mufflers applied to individual pieces of equipment, would be capable of reducing construction-related noise an additional 1.3 dBA to within the 5 dBA threshold used to judge significant adverse noise increases in CEQR. However, with the noise barrier in place, construction related noise exceeding the 3-5 dBA would only be experienced during the period of construction associated with rock excavation and removal (April 2006 – July 2007) and sporadically thereafter. With the noise barrier in place, therefore, the remaining construction noise exceeding the CEQR threshold would be temporary and not significant.

Table 10 shows the anticipated noise levels at impacted sensitive receptors with and without mitigation measures. With the exception of MGC-S2, construction-related noise would be attenuated to acceptable levels with the noise barriers in place. The residences along Jerome Avenue and the more distant residences on East Gun Hill Road would be mitigated by the installation of the noise barrier. These receptors would not experience a significant adverse impact from the proposed construction following mitigation.

Construction-generated noise still would result in a significant impact at the Mosholu golf course immediately to the west of the construction site (Receptor MGC-S2). With a noise barrier in place, the receptor would experience an increase in noise levels of approximately 11.5 dBA above CEQR threshold. The future without the project noise levels at this receptor is 52.2 dBA (at its quietest) and the CEQR threshold noise level for this receptor is 57.1 dBA.

A number of options are available to further attenuate noise at this receptor. A noise barrier constructed of a more highly sound absorbent material, such as concrete, masonry, or rock, could be used along the west boundary of the construction site. These materials give a transmission loss of upwards to 25 dBA, which would be enough to attenuate construction noise to an acceptable level¹⁰. This option has the advantage of not restricting access and movement of construction workers and equipment around the site.

Another option is to identify noise-generating equipment on site that is stationary (such as air compressors, rock drills, welding machines, cranes, etc.) and place portable noise barriers around them. These types of curtains are generally capable of approximately 11 dBA of sound transmission loss (i.e., attenuation) for each piece of equipment to which it is applied. A full 11-

¹⁰ US Department of Housing and Urban Development, <u>The Noise Guidebook</u>, June 2002.

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TABLE 10. NOISE LEVELS AT SENSITIVE RECEPTORS BEFORE AND AFTER MITIGATION MEASURES AT MOSHOLU SITE

Proximate Receptor	Monitoring Period	Future Without the Project Noise Level (2006)	Total Noise During Construction Without Mitigation (2006)	Incremental Change Without Mitigation	Incremental Change above CEQR Threshold Without Mitigation	Approximate Attenuation Due to Noise Barrier	Incremental Change above CEQR With Mitigation	Total Noise Levels During Construction With Mitigation (2006)
MGC-S1	8-9 AM	64.8	73.1	8.3	5.4	13	0	60.1
	2-3 PM	60.0	72.6	12.6	7.7	13	0	59.6
MGC-S2	11AM-2PM	55.1	81.6	26.5	21.6	13	8.6	68.6
	7-8 AM	52.2	81.6	29.4	24.5	13	11.5	68.6
MGC-S3	8-9AM	56.4	72.5	16.2	11.3	13	0	59.5
	2-3 PM	53.4	72.5	19.2	14.3	13	1.3	59.5
MGC-S4	8-9 AM	64.8	68.6	3.8	0	13	0	55.6
	12-1 PM	59.1	68.6	9,5	4.5	13	0	55.6
MGC-S6	8-9 AM	66.1	70.1	.4.0	0	13	0	57.1
	12-1 PM	65.5	70.1	4.6	0	13	0	57.1

(Leq, dBA)

dBA reduction would not be observed in the total noise levels experienced at the receptors because there are other pieces of construction equipment on site that also would be generating noise. The disadvantage to this approach is that portable barriers restrict the movement of workers on a construction site and are not considered practicable.

As a supplement to the noise abatement systems that are proposed for the water treatment plant site, NYCDEP would establish a monitoring program and dedicated complaint response system to address any unforeseen construction- or operations-related noise impacts.

3.3.4. Natural Resources

3.3.4.1. Vegetation and Trees

The necessary clearing and grading for the proposed water treatment plant facilities would result in the direct loss of 278 trees.

In addition, trees immediately adjacent to the proposed limit of construction line or close to the proposed infiltration trench (described in the Stormwater Pollution Prevention Plan (SWPPP) described below and in Appendix G) could be threatened by compaction of soils over their roots, changes in surface or groundwater drainage patterns, or accidental damage, if special care is not taken to protect them. There are 166 trees that would fall into this category. Even though the NYCDEP plans to protect these trees by placing Jersey barriers at least twenty feet from their canopies and by other means described below, for the purpose of this environmental analysis, the trees are considered potentially lost and part of the characterization of potentially significant adverse impacts on natural resources.

Finally, a group of 16 trees, mostly white pines (*Pinus alba*), would be threatened by the proposed temporary widening of the Major Deegan off-ramp at 233rd Street proposed as a temporary traffic improvement measure. The white trees that would be removed for the traffic improvements are small and replaceable in-kind.

Trees and associated vegetation within a protected park environment, such as the ones being impacted within Van Cortlandt Park by the proposed project are rare in New York City and, since it is not possible to regain lost value promptly by replanting since trees need several years to mature, their loss would represent a potentially significant adverse impact.

In order to mitigate this impact and the potential adverse impact to the five-acre floodplain forest wetland area discussed below, a comprehensive reforestation and monitoring program has been developed in conjunction with the NYCDPR. The NYCDPR reforestation program would consist of the planting of trees to replace the trees that would be lost during the construction of the proposed water treatment plant, to preserve the forested wetland area discussed below, and to restore and preserve other natural resources of Van Cortlandt Park. The monitoring program would start prior to construction and extend for at least three years after the proposed water treatment plant operations commence, representing a ten-year effort.

3.3.4.2. Wetlands

The dewatering of the water treatment plant foundation would locally lower the water table. This could result in a potential change in the stormwater and groundwater hydrology of the site area that could adversely affect the five-acre floodplain forest wetland north of the site entrance roadway in the Shandler Recreation Area. The change to this forested wetland would represent a potential significant adverse impact.

To mitigate this impact, a number of actions would be taken. First, during excavation, any fractures that leak water into the excavation would be sealed with grout under pressure. This would seal rock fractures and reduce the potential for water to flow from the wetland to the excavation site. Second, a SWPPP would be implemented to maintain the existing hydrology, to the extent possible.

The SWPPP calls for the construction of infiltration structures adjacent to the site access road and to the south of the forested wetland. The infiltration structure would extend from near Jerome Avenue westward parallel to the western side of the proposed water treatment plant footprint. Water would be collected along the west and northwestern side of the proposed water treatment plant at an elevation of 180 feet, along the top of the bedrock. This is the flow, which currently drains toward the wetland. This flow would be supplemented with tap water as needed based on the monitoring of water levels at monitoring wells adjacent to the wetland. These flows would maintain a base flow equal to the volume that would migrate through bedrock toward the bottom of the foundation. This water would be passed to a series of infiltration galleries (horizontal underground diffusion devices) north of the water treatment plant footprint. The galleries would be about 10-15 ft. below grade so that the existing grade would not be altered. Overflow from the galleries would be channeled to an infiltration trench adjacent to the site access road. The infiltration trench would be an open structure that would be adjacent to site entrance. Storm flows would be collected from rooftop drain lines on the water treatment plant after the water would pass through the soil that would be on the roof. This infiltration trench would also receive storm flows from the parking area after it passes through an oil/water separator. The reasons why storm flows would be channeled to the infiltration trench are: 1) to mitigate discharges to the combined sewer system and 2) to temporarily raise the groundwater levels during storm events around the forested wetland in order to mimic existing conditions. Excess storm flow would pass through a weir to the combined sewer on Jerome Avenue. These devices would replenish groundwater and produce a mound of water, which would prevent flows from leaving the wetland area to travel toward the proposed water treatment plant facilities. Once built and calibrated, these stormwater/groundwater control devices would require no pumping, active control devices, or extensive maintenance. None of the water in the infiltration system would be discharged to the wetland. Instead, the water would infiltrate to groundwater, preventing the lowering of the water levels in the wetland.

During construction of the water treatment plant, water collected in the excavated areas would be pumped to the combined sewer on Jerome Avenue. The infiltration galleries and trench would be constructed and connected to the city water supply system and calibrated to preserve the local hydrologic conditions as described above while construction dewatering operations are taking place. Initial operation of this system would be monitored by NYCDEP in conjunction with NYCDPR. Additional numerical modeling would be utilized to adjust the rate of flow, if necessary. Once the flow to the infiltration device is shown to be maintaining the existing hydrology, no additional adjustments or maintenance would be required except for periodic cleanout of the infiltration trench.

The efforts described above would minimize impacts to the floodplain forest wetland area by providing a base flow that would allow the existing groundwater characteristics to be maintained at the existing average standing water elevation during dry weather. It would also provide storm flow that would replicate stormwater events thereby providing wet weather and seasonal variability. This would be a passive system, requiring no pumping or active control devices.

However, even with these measures in place, the hydrologic regime would change to some extent leading to natural resource changes. It is likely soils near the infiltration trench may become over-saturated leading to the loss of trees unable to adjust to this condition. The number of threatened trees would be approximately thirty-six. (This estimate is included in the total number of 166 threatened trees discussed above under vegetation and tress.) In addition, the understory of the wetland would likely change in character because of the changes in hydrology. The understory changes are not anticipated to be significant. Overall, the potential loss of trees and changes to the wetland understory are not anticipated to be significant if the SWPPP is properly functioning and the area is monitored and actively managed. Monitoring of the system would include the following for two years pre-construction, during construction, and three years post-construction:

- Monthly groundwater levels at five monitoring wells in and around the wetland;
- Annual monitoring of tree health and growth in and adjacent to the wetland and around the entire excavation site;
- Twice annual surveys for rare, threatened, and endangered species;
- Twice annual surveys of vegetation plots; and
- Spring, summer, and fall recording of soil moisture at 200 ft. intervals around the excavation.

In summary, the combination of constructing the control devices and the implementation of the NYCDPR/NYCDEP reforestation and monitoring program is anticipated to mitigate any potential significant adverse impacts to natural resources. However, should the monitoring and reforestation programs prove less successful than predicted in this Final SEIS, the NYCDEP would work with the NYCDPR to adjust the mitigation program and would be responsible for replacing any unforeseen natural resource losses.

3.3.5. Public Health Mitigation

In response to public concerns about the potential for construction activities to increase movement of nuisance rodents, NYCDEP has developed a rodent control and monitoring plan that would be implemented at this site if it were selected for the water treatment plant. An active program would be instituted to control the existing population, prevent the opening of conduits for rodents to and from the site, and a hygiene program during construction to prevent the creation of new food sources. This type of program has been proven to be successful on other large construction sites (e.g., "the Big Dig" in Boston) where very extensive tunneling and deep excavation occurred.

3.4. POTENTIALLY SIGNIFICANT ADVERSE IMPACTS AND MITIGATION AT THE HARLEM RIVER SITE.

3.4.1. Introduction

Avoidance of potential environmental impacts would be part of the construction plans. For example, a vibration prevention/monitoring program would be implemented during construction. Similarly, to the extent possible, paving of interior construction roadways and dust suppression techniques are incorporated in construction plans to eliminate air quality nuisances. Stormwater management both during construction and operations would be provided to prevent the release of particulate material to the nearby Harlem River. The historic University Heights Bridge, on the southern boundary of the proposed site, would be protected from direct impact. The heavy granite architectural character of the Bridge, its ramps, and abutments, would be used in the design of facades and plant roadways around the site. Finally, contractors would be required to utilize barges for the transport of bulk materials in order to avoid adding significant numbers of trucks onto the local road network and the Major Deegan Expressway, which are already congested and constrained.

This section details mitigation measures that would minimize or avoid potentially significant impacts. The project impact sections for several impact categories concluded that neither the proposed construction nor operational activities would result in significant impacts. These parameters are not discussed in this section and include: Land Use, Zoning and Public Policy; Open Space; Waterfront Revitalization; Visual Character; Community Facilities; Neighborhood Character; Socioeconomic Conditions; Air Quality; Noise; Water Resources; Historic and Archaeological Resources; Infrastructure and Energy; EMF/ELF; and Solid Waste. The potential for impacts on these parameters are described in the appropriate construction and project impact sections

3.4.2. Traffic

The main access routes to the Harlem River Site would be the Major Deegan Expressway (I-87) and West Fordham Road. The analysis of the traffic conditions in the Construction Year indicated that capacity deficiencies would occur in the future without and with the proposed project at three intersections along these roads. In order to maximize capacity of these intersections, and to mitigate the potential impacts of the construction traffic and the Future With the Project traffic, the following mitigations measures are recommended to be part of the project at the Harlem River Site. Each of these intersection mitigation plans would be based upon the potential construction impacts that would occur during peak construction periods.

It should be noted that the following proposed mitigation plans contemplate the re-apportioning of the "green light time" for critical approaches at different intersections in the study area. This measure is intended to improve the overall intersection LOS and delay in certain intersection.

These plans will improve the LOS and reduce delays back to the Future Without the Project conditions. However, in some cases these improvements might actually worsen other approaches to the same intersection i.e., increases delay or worsen LOS, but overall would improve the intersection conditions and LOS.

- 1. West Fordham Road at the Major Deegan Expressway (I-87) Southbound Ramps: Optimize signal timing. This intersection would operate at LOS D in both the AM and PM peak hours. During both the AM and PM peak hours, the signal optimization traffic improvement proposed as mitigation would not reduce all of the individual lane group construction traffic delays below those considered to be significant adverse impacts in accordance with CEQR criteria. Additional intersection geometric improvements have not been proposed due to the constraints at this location. Therefore, potential traffic impacts at this intersection during construction would be unmitigatable.
- 2. West Fordham Road at the Major Deegan Expressway (I-87) Northbound Ramps: Optimize signal timing. The overall intersection would operate at LOS C in both the AM and PM peak hour. During both the AM and PM peak hours, the signal optimization traffic improvement would not reduce all of the individual lane group construction traffic delays below those considered to be significant adverse impacts in accordance with CEQR criteria. Therefore, the potential significant adverse impact at this intersection would remain unmitigatable.
- 3. West Fordham Road at Sedgwick Avenue: Optimizing signal timing and adding a northbound left turn lane would result in the intersection operating at LOS D in the AM and PM peak hours with reduced delay. On-street parking would need to be removed along the northbound approach to accommodate the additional lane. The construction traffic would necessitate signal optimization at the start of construction as described below. Construction traffic volume levels would not reach the levels necessitating the northbound left turn lane until 2009 with a duration of a little more than one year. The removal of valuable on-street parking in this area to install a turn lane is not justified for the short duration of the peak construction generated traffic. The optimizing of the signal timing would be performed. This would mitigate a portion of the impact, but would not mitigate the full impact. Therefore, a portion of the significant adverse impact at this intersection would remain unmitigatable.

The traffic improvements primarily call for optimizing signal timings to reduce the potential increase in delay created by construction traffic volumes. All the truck traffic would be restricted from entering the Site from the south, so the construction induced traffic would be restricted to worker arrivals. Since the construction volume peaks are anticipated to arrive before and after the AM and PM peak hours respectively, the degree of mitigation that would be required is small. It is standard practice to conduct traffic counts after construction begins to provide actual traffic patterns to document and justify the modification to signal timings, rather than try to optimize for the off-peak period during which the construction workers would arrive. The potential traffic improvements would be developed in accordance with NYSDOT and NYCDOT design guidelines. In addition, the potential traffic improvement designs would need to undergo

review by the NYSDOT, NYCDOT, and/or other roadway jurisdictional bodies prior to being implemented. Should the potential mitigation measures proposed (i.e., the optimization of signal timing) to reduce project-related delays not be reasonable because of the increase in delay at other approaches, or because the construction period impacts would be short-term and temporary, not warranting signal timing changes, these traffic improvements would be modified.

In addition to these minor changes in signal timing, structural improvements would be made to the routes from which the truck traffic would access the site. This includes:

- the addition of a second exit ramp line from the northbound Major Deegan Expressway exit at 233rd Street. This would allow traffic to flow smoothly eastbound in one lane to 233rd Street while the new lane could accommodate traffic making the right turn to southbound Jerome Avenue and from there to the Mosholu Site;
- The addition of a dedicated left turn lane from 233rd Street westbound to allow easier left turns onto Jerome Avenue southbound without blocking access to the Major Deegan from 233rd Street, and:
- The addition of a new right turn lane in front of the southbound stoplight at Bainbridge Avenue and Jerome Avenue, thus allowing unrestricted access to the Mosholu Site for traffic from the north.

3.4.3. Hazardous Materials

3.4.3.1. Hazardous Materials Disturbed During Construction

Based on sampling efforts performed for this Final SEIS, data are available identifying potential contaminants of concern at the Harlem River Site. Volatile and semi-volatile organic compounds (VOCs, SVOCs) related to gasoline and diesel range total petroleum hydrocarbons (TPH) were detected in the soil and groundwater at different locations at the site. The data also indicated that selected metals were found in the soil at concentrations that could be considered higher than normal background levels for the eastern United States. Based on information derived from regulatory reports (see Section 7.13, Hazardous Materials), PCB residues in soil may be present at a localized portion of the site. In addition, sediment in the river adjacent to the Site was found to contain semi-volatile organic compounds as well as elevated concentrations of selected metals. Although the concentrations of the environmental contaminants present in the soil, groundwater, and sediment at the Harlem River Site do not pose an imminent public health risk, the potential for significant adverse impacts from the existing hazardous material exists. Specialized management of these materials during construction is necessary to mitigate the potential for significant adverse impacts on public health and safety of construction workers and adjacent site occupants both during construction and operation of the proposed project.

As a mitigating measure, a site-specific Construction Contamination Management Plan (CCMP) would be prepared which contains a detailed Sampling and Analysis Plan (SAP). The SAP would be implemented to more precisely delineate the zone(s) of potential contamination (ZOPC) in areas where construction activities that would disturb the soil, groundwater, or river sediment are planned. Results derived from the application of the SAP would provide the

specific types of data needed to make appropriate and cost-effective waste management decisions (e.g., treatment, stabilization, off-site disposal, health and safety). The CCMP would be developed in conjunction with Local, State, and Federal agencies and would address all applicable or relevant and appropriate requirements.

The CCMP would also describe the requirements for handling, management, treatment, and disposal of contaminated materials encountered during construction. Since proposed actions at the Harlem River Site would involve excavation below the groundwater table, tunneling, and the construction of shafts and subsurface chambers, the CCMP would address management of groundwater contamination, if present, including containment, treatment, and discharge options. The CCMP would include contingencies to address unexpected hazardous materials discovered during construction activities such as drums, underground tanks, waste debris, and related types of contaminated media.

The CCMP would identify requirements for Health and Safety Plans (HASPs) to be developed by each construction contractor and approved by NYCDEP prior to the commencement of work at the site. The HASPs would comply with 29 CFR §1910.120 and would include health and safety requirements related to site-specific environmental conditions. Worker safety issues related to construction activities and general public protection would be included in the plans.

3.4.4. Natural Resources

Potentially significant impacts from the construction and operation of the proposed plant at the Harlem River Site include the removal of 101 trees and the construction of a permanent bulkhead structure that would result in filling approximately 63,000 square feet (approximately 1.5 acres) of the Harlem River between the existing riprap shoreline and the mapped pier and bulkhead line. Although the site is heavily disturbed, industrialized, and offers limited habitat value, mitigation has been planned to fully compensate for the loss of vegetation and tidal wetlands onsite. The concept planned for this mitigation would include 1.8 acres of wetland mitigation onsite and an additional 1.2 acres offsite to provide enhanced habitat for the aquatic and riparian wildlife at a mitigation ratio of 2:1.

3.4.5. Public Health

In response to public concerns about the potential for construction activities to increase movement of nuisance rodents, NYCDEP has developed a rodent control and monitoring plan that would be implemented at this site if it were selected for the water treatment plant. An active program would be instituted to control the existing population, prevent the opening of conduits for rodents to and from the site, and a hygiene program during construction to prevent the creation of new food sources. This type of program has been proven to be successful on other large construction sites (e.g. "the Big Dig" in Boston) where very extensive tunneling and deep excavation occurred.

3.5. POTENTIALLY ADVERSE IMPACTS AND MITIGATION AT THE OFF-SITE FACILITIES

3.5.1. Introduction

Avoidance of potential environmental impacts would be an integral part of construction plans at the various off-site facilities associated with all water treatment plant site alternatives. For example, noise barriers and dust suppression techniques would be incorporated into construction plans to eliminate nuisances to the extent practical and feasible. Stormwater management during construction would be provided to prevent the release of particulate material into nearby water bodies. Without the incorporation of these and other design features, additional significant impacts could have occurred.

This section details mitigation measures that have been developed to address the potential significant impacts that could not simply be avoided. No significant adverse impacts were identified in the following impacts categories and are therefore not considered in this section: Land Use, Zoning, and Public Policy Open Space; Visual Character; Community Facilities; Neighborhood Character; Socioeconomic Conditions; Growth Inducement; Air Quality; Hazardous Materials; Natural Resources; Water Resources; Archaeological Resources; Infrastructure and Energy; EMF/ELF; Solid Waste; and Public Health. Significant impacts as a result of proposed project activities at the off-site facilities were identified and discussed in Section 8, Off Site Facilities.

3.5.2. Noise at the Shaft Sites

Construction activities would lead to an increase in noise levels that exceed the 3-5 dBA acceptable noise increase threshold as established under CEQR at the Shaft Sites. The noise level increases could last for the duration of the proposed construction (2010 until 2015 for pressurization) and 2009-2010 at the New Shaft Chamber and other sites near Jerome Park Reservoir. If the Mosholu Site is selected the peak noise at Gate House No. 1 would occur 2009-2010 instead of 2010-2015 if the pressurization alternative was selected.

Measures to mitigate potential construction-generated noise impacts at the sensitive receptors around all the shaft sites were studied. Following completion of construction at the shaft sites, activities would return to those presented in the existing conditions. Therefore, no significant mobile or stationary noise impacts were expected as a result of future normal operations at any of the shaft sites.

Sensitive receptors could experience a significant impact as a result of construction activities. Predicted project-induced noise levels for the peak construction-noise year (2013 shaft sites, 2010 Jerome Park Reservoir) were compared to the predicted future baseline noise levels for 2013 and 2010. Attenuation measures were identified and the noise levels at the sensitive receptors following the possible implementation of mitigation were estimated.

3.5.2.1. Mobile Source Noise

No noise contributions are expected from mobile sources as a result of operation or construction at any of the shaft sites. The results of the mobile source operation and construction impacts analysis are presented in Section 8.0. Mitigation measures were not required along noise sensitive route segments.

3.5.2.2. Stationary Source Noise

Construction activities could potentially produce a noise impact requiring mitigation, if determined to be practicable and feasible. As such, noise level increases were anticipated only during weekday construction hours (7:00 AM - 6:00 PM). The construction noise increases are considered to be temporary impacts.

The equipment usage and the number of personnel working at the shaft site would not fluctuate over the duration of the construction schedule. As a result, peak noise levels at the site are not expected to vary and any noise-mitigation requirements would be constant for the entirety of the project. The equipment most responsible for the increased noise levels would be the concrete pump and idling delivery trucks. The greatest predicted incremental change in noise levels would occur during work hours when the background noise levels are lowest, which is 9:00 through 10:00 AM on weekdays. Predicted maximum incremental increases at the shaft sites are as follows:

- Shaft No. 9, Village of Sleepy Hollow, NY: Greatest incremental change would be 10.5 dBA at park west of shaft
- Shaft No. 14, Village of Ardsley, NY: Greatest incremental change would be 20.4 dBA at park in front of public library north of shaft
- Shaft No. 18, City of Yonkers, NY: Greatest incremental change would be 19.6 dBA at residence on Summerfield St. immediately east of shaft
- Gate House No. 1, Bronx, NY: Greatest incremental change would be 15.5 dBA at park surrounding gate house
- Jerome Park Reservoir, Bronx, NY: Greatest incremental change would be 7.6 dBA at a school east of the site.

Noise attenuation systems that could reduce the increased noise levels from construction activities at the sensitive receptors were identified. Noise barriers facing the potentially impacted residential and library receptors at Shaft No 14 and the residential receptors at Shaft No. 18 would be installed at fixed locations along the boundary of the construction sites if they are found to be practical and feasible. Noise barriers placed in a fixed location would satisfy the attenuation requirements and would not restrict the movement of on-site workers and equipment during construction.

Attenuation measures are proposed at Shaft Nos. 14 and 18 as well as at the Jerome Park Reservoir. These measures could include the use of noise barriers, mufflers, and other measures. In addition to these types of measures being implemented at the Jerome Park Reservoir the noisiest construction work would occur on weekends, holidays (including school holidays), and summers to avoid unnecessarily inconveniencing classes in the nearby schools. This measure has been incorporated in response to public comment received on the Draft SEIS.

3.5.3. Traffic at the Shaft Sites

The project would not create any new traffic at the off-site facilities during operations, so no traffic analysis is necessary for operational conditions. Construction traffic was studied in detail, and potentially significant adverse impacts could occur at intersections near Shaft No. 14 and Shaft No. 18, due to the increases in traffic in these congested areas induced by the long construction durations (5 years).

In order to maximize capacity of these potentially affected intersections, and to mitigate the potential impacts of the construction traffic and the Future With the Project traffic, the following mitigations measures are recommended to be part of the project at the sites described separately below. Each of these intersection mitigation plans would be based upon the potential construction impacts that would occur during peak construction periods.

It should be noted that the following proposed mitigation plans contemplate the re-apportioning of the "green light time" for critical approaches at different intersections in the study area. This measure is intended to improve the overall intersection LOS and delay in certain intersection. These plans will improve the LOS and reduce delays back to the Future Without the Project conditions. However, in some cases these improvements might actually worsen other approaches to the same intersection i.e., increases delay or worsen LOS, but overall would improve the intersection conditions and LOS.

The potential traffic improvements described below primarily call for optimizing signal timings to reduce the potential increase in delay created by construction traffic volumes. Since the construction volume peaks are anticipated to arrive before and after the AM and PM peak hours respectively, the optimum signal timings utilized are approximate. It is standard that traffic counts be performed at these locations after construction begins to provide actual traffic patterns to document and justify the modification to signal timings. The potential traffic improvements would be developed in accordance with NYSDOT and NYCDOT design guidelines. In addition, the potential traffic improvement designs would need to undergo review by the NYSDOT, NYCDOT, and/or other roadway jurisdictional bodies prior to being implemented. Should the potential mitigation measures proposed (i.e., the optimization of signal timing) to reduce project-related delays not be reasonable because of the increase in delay at other approaches, or because the construction period impacts would be short-term and temporary, not warranting signal timing changes, these potential construction impacts would be unmitigated.

3.5.3.1. NCA Shaft No. 14

Saw Mill River Road is the primary access route to the NCA Shaft No. 14 site. The traffic analysis of the Construction Year conditions indicated that capacity deficiencies would be expected at three intersections. In order to maximize capacity of these intersections, and to

reduce the impact of the construction traffic, the following mitigation measures are recommended and are considered to be part of the project.

- 1. *Saw Mill River Rd (Rt 9A) at Ashford Avenue:* Optimize signal timing and adjust phasing scheme. This intersection would still operate at LOS F in the AM and LOS E in the PM peak hours, but with reduced delays.
- 2. *Ashford Ave at Saw Mill River Parkway NB Ramps:* Optimize signal timing. This intersection would operate at LOS C in the AM peak hours and LOS B in the PM peak hours.
- 3. *Ashford Ave at Saw Mill River Parkway SB Off Ramps:* Optimize signal timing. This intersection would operate at LOS E in the AM peak hours and LOS D in the PM peak hours, but with reduced delays.

3.5.3.2. NCA Shaft No. 18

The main access routes to the shaft site are along Yonkers Avenue and Broadway (Route 9A). The traffic analysis of the Construction Year conditions indicated that capacity deficiencies would be anticipated at two intersections along this road. In order to maximize capacity of these intersections, and to mitigate the potential impacts of the construction traffic, the following mitigations measures are recommended and are considered to be part of the project.

- 1. *Yonkers Avenue and Midland/Cook Avenue:* Optimize signal timing. This intersection would still operate at LOS C in the AM peak hour and PM peak hours.
- 2. *Nepperhan Avenue and Broadway (Route 9A):* Optimize signal timing. This intersection would operate at LOS D in the AM and PM peak hours, but with reduced delays.

3.5.4. Jerome Park Reservoir Facilities

As described above in the project description, most of the facilities around Jerome Park Reservoir would undergo rehabilitation regardless of the choice of water treatment plant site. Shaft No. 21 would be fitted with an electrically driven ventilation fan. This site is far enough from any receptor that noise emissions would not be a concern.

The new shaft chamber north of Gate House No. 5, along the west side of Goulden Avenue would be excavated to receive a finished water tunnel. If the water treatment plant were built in Eastview, and the NCA is chosen as the treated water conveyance, the finished water tunnel would be from the NCA near Shaft No. 21. If the water treatment plant were built at the Mosholu Site the tunnel would arrive from the north; if the Harlem River site were selected the finished water tunnel would be approaching from the south. In any case the magnitude and duration of the work would be similar for all three site alternatives.
Most of this work would take place seasonally between 2007 and 2009-2010, with some work 2006-2007. Some of this work would take after the water treatment plant would be operational, in 2010-2011. If the NCA is pressurized to convey treated water from the Eastview Site the work would take place 2011-2014. After construction the facilities would be restored to their existing appearance, and no new above-grade structures would be built. The surface ventilation structure above the Mosholu Pump Station and the Microstrainer building near Gate House No. 6 would be removed.

This work would not result in any potential significant impacts except that noise from the construction planned near Gate House No. 5 would potentially have a significant adverse impact on the Bronx High School of Science. Other receptors farther away would have measurable increases in noise as well. Noise reduction measures, including the possible use of A 20-foot high noise barrier, described above in the impact summaries for noise at the shaft sites, would effectively prevent this noise from being significant during the construction period and would be included as part of the proposed project. This increase in noise levels would occur seasonally during the winters through early summers 2007-2010.

4. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS

4.1. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR THE EASTVIEW SITE

DEPARTMENT	PERMIT TITLE
U.S. Federal Government	
Army Corps of Engineers	• Dredge and Fill Permit/ Freshwater Wetlands (Clean
	Water Act, Section 404)
Advisory Council on	o Memorandum of Agreement (Section 106 of the
Historic Preservation	National Historic Preservation Act of 1966)
New York State	
Department of	State Pollution Discharge Elimination System
Environmental	(Environmental Conservation Law, Article 17, Title 8;
Conservation	6 NYCRR Parts 750 through 757)
	• Water Quality Certification (Clean Water Act, Section
	401)
	Protection of Waters Permit (Environmental
	Conservation Law, Article 15, Title 15; 6 NYCRR
	Part 608)
	• State Facility (Air) Permit (Environmental
	Conservation Law, Article 19; 6 NYCRR 200-317)
	Water Supply Permit (Environmental Conservation
	Law, Article 15, Title 15; 6 NYCRR Part 601)
	Mined Land Reclamation Permit (Environmental
	Conservation Law, Article 23; 6NYCRR Part 420
	through 425)
Department of Health	• State Environmental Review Certification for New
	York Revolving Fund Program (Public Health Law,
	Sections 1161 and 1162; 21 NYCRR Part 2604)
	Approval of Disinfection Process and Plant Design
	• Permit to Construct and Operate Potable Water Works
	(NYCRR Title 10 Part 5-1.22)
Department of	• Highway Work Permit (Title 17, Part 126 of NYCRR)
Transportation	• Traffic Enhancement Permits (Title 17, Part 126 of
	NYCRR)
Department of Parks,	Memorandum of Agreement (National Historic
Recreation, and Historic	Preservation Act of 1966 and the New York State
Preservation/State Historic	Historic Preservation Act of 1980)
Preservation Office	
Westchester County	r
Department of	• Approval of Treatment Process and Plant Design
Environmental Facilities	(County Sanitary Code, Sec. 873.707)

4.1. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR THE EASTVIEW SITE

DEPARTMENT	PERMIT TITLE
Department of Health	• Approval of Completed Works (County Sanitary Code, Sec. 873.707)
	• Approval to Construct & Operate Air Contaminant Source (County Sanitary Code, Sec. 873.1303; 873.1306)
	• Petroleum Bulk Storage Registration (County Sanitary Code, Sec. 873.2513)
	• Approval of Treatment Process and Plant Design (County Sanitary Code, Sec. 873.707)
Department of Public Works	• Approval for the use of Mercury Lamps (County Consumer Protection Code, Sec. 863.703)
	 Building Approval (General Municipal Law, Section 239-f)
	Westchester County Road Opening Permit (Westchester County Administrative Code)
	• Approval of County Road Access (Westchester County Administrative Code)
Department of Environmental Facilities	• Permit to Connect to County Sewer System (Westchester County Code, Chapter 824)
	• Permit to Connect to County Water Distribution System (County Sanitary Code, Sec. 873.712)
	• Industrial User's Permit 6 (Westchester County Code, Article IX of Chapter 824; County Environmental Facilities Sewer Act)
Department of Planning	• Planning Board Review (Section 239 L, M, and N of NYS General Municipal Law and Section 277.1 of County Administrative Code)
Town of Mount Pleasant	
Planning Board	• Freshwater Wetlands Permit (Mount Pleasant Code, Section 111.1)
	• Site Plan Approval (Mount Pleasant Code, Section 218-97)
Town Board	• Special Use Permit: Water Supply Use (Mount Pleasant Code, Section 218-55)
	 Height Variance (Mount Pleasant Code, Section 218- 69)*
	• Approval by Advisory Board on Architectural and Community Appearance (Mount Pleasant Code, Section 14 Article 1)

4.1. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR THE EASTVIEW SITE

DEPARTMENT	PERMIT TITLE
	• Parking and Loading Spaces (Mount Pleasant Code, Section 218-70)
	• Coverage Variance* (Mount Pleasant Code, Section 218-70)
Building Department	• Excavation and Removal of Soil (Mount Pleasant Code, Section 96-5)
	• Building Permit (Mount Pleasant Code, Section 68-7)
	• Hazardous Chemicals/Flammable Liquid Storage Permit (Mount Pleasant Code, Section 104-25)
	• Oil-Burning Equipment Registration (Mount Pleasant Code, Section 104-44)
	• Blasting Permit (Mount Pleasant Code, Section 104)
Town Highway Department	• Curb/Street Cut Access Permit (Mount Pleasant Code, Section 188)
City of New York	
Art Commission	• Project Approval (Chapter 37, Sections 851-857)

* If the proposed Croton project is the first large NYCDEP project to apply for Site Approval on the Eastview Site, this approval would not be needed. If the Cat/Del UV Facility is the first project to apply for Site Approval, the proposed Croton project would require a coverage variance.

4.2. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR THE MOSHOLU SITE

DEPARTMENT	PERMIT TITLE
U.S. Federal Government	
4.2.1.1.1.1 Army Corps of Engineers	• Dredge and Fill Permit (Clean Water Act, Section 404)
New York State	
Department of Environmental Conservation	• State Facility (Air) Permit (Environmental Conservation Law, Article 19; 6 NYCRR 200-317)
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
Department of Transportation	 Highway Work Permit (Title 17, Part 126 of NYCRR) Traffic Enhancement Permit (Title 17, Part 125 of NYCRR)
NYSOPRHP	State Historic Preservation Office Approval
MTA Approval	Track Crossing Approval

Additional New York City Approvals

Permits and approvals required for the construction and operation of the Croton WTP within the City include permits from NYCDPR for work in Van Cortlandt Park. Approvals from the New York City Landmarks Preservation Commission are also required for work in the vicinity of the Jerome Park Reservoir.

The Department will secure all applicable approvals necessary. All permits and approvals considered to be potentially required and the rationale for them will be made public

4.3. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR THE HARLEM RIVER SITE

DEPARTMENT	PERMIT TITLE
U.S. Federal Government	
Army Corps of Engineers	• Dredge and Fill Permit (Clean Water Act, Section 404)
Department of Commerce	• Federal Coastal Zone Management Program Review (16 USC, Chapter 33, Section 1451)
Coast Guard	Docking Approval
New York State	
Department of Environmental Conservation	 State Pollution Discharge Elimination System (Environmental Conservation Law, Article 17, Title 8; 6 NYCRR Parts 750 through 757) Water Quality Certification (Clean Water Act, Section 401) Protection of Waters Permit (Environmental Conservation Law, Article 15, Title 15; 6 NYCRR Part 608) Tidal Wetlands Permit (Environmental Conservation Law, Article 25, 6 NYCRR 661) State Facility (Air) Permit (Environmental Conservation Law, Article 19; 6 NYCRR 200-317)
Department of State	• Coastal Management Plans (Part 600 of Title 19 NYCRR)
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
Department of	• Highway Work Permit (Title 17, Part 126 of NYCRR)
Transportation	• Traffic Enhancement Permit (Title 17, Part 125 of NYCRR)
NYSOPRHP	State Historic Preservation Office Approval
MTA Approval	Track Crossing Easement

Additional New York City Approvals

Permits and approvals required for the construction and operation of the Croton WTP within the City include permits from the NYCDPR for work in Van Cortlandt Park. Approvals from the New York City Landmarks Preservation Commission are also required for work in the vicinity of the Jerome Parke Reservoir.

The Department will secure all applicable approvals necessary. All permits and approvals considered to be potentially required and the rationale for them will be made public.

4.4. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR CROTON LAKE GATE HOUSE

DEPARTMENT	PERMIT TITLE
New York State	
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	State Historic Preservation Office Approval
Town of Yorktown	
Town Board	• Building Permit (Yorktown Town Code, Section 130-2)

4.5. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR NCA SHAFT NO. 9

DEPARTMENT	PERMIT TITLE
U.S. Federal Government	
Army Corps of Engineers	• General Permit; NWP (Clean Water Act, Section 404)
New York State	
Department of	State Pollution Discharge Elimination System
Environmental	(Environmental Conservation Law, Article 17, Title 8; 6
Conservation	NYCRR Parts 750 through 757)
	• Water Quality Certification (Clean Water Act, Section 401)
	• Protection of Waters Permit (Environmental Conservation Law, Article 15, Title 15; 6 NYCRR Part 608)
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	State Historic Preservation Office Approval
Village of Sleepy Hollow	
Planning Board	• Site Plan Approval (Mount Pleasant Code, Section 218- 97)
	• Freshwater Wetlands Permit (Mount Pleasant Code, Section 111)
Building Department	• Building Permit (Mount Pleasant Code, Section 68-7)
	• Noise Variance (Mount Pleasant Code, Section 139-18)

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4.6. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR NCA SHAFT NO. 14

DEPARTMENT	PERMIT TITLE
New York State	
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	State Historic Preservation Office Approval
Village of Ardsley	
Board of Trustees	 Site Plan Approval Building Permit (Greenburgh Town Code, Section 100-5) Noise Variance (Ardsley Village Code Chapter 137-1 through 137-4)

4.7. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR NCA SHAFT NO. 18

DEPARTMENT	PERMIT TITLE
U.S. Federal Government	
Army Corps of Engineers	• General Permit; NWP (Clean Water Act, Section 404)
New York State	
Department of Environmental	State Pollution Discharge Elimination System (Environmental Conservation Law, Article 17, Title 8: 6
Conservation	NYCRR Parts 750 through 757)
	• Water Quality Certification (Clean Water Act, Section 401)
	• Protection of Waters Permit (Environmental Conservation Law, Article 15, Title 15; 6 NYCRR Part 608)
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	State Historic Preservation Office Approval
City of Yonkers	
Director of the Bureau of	Site Plan Approval
Housing and Buildings	• Building Permit (Yonkers Town Code, Section 43-105)

4.8. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR GATE HOUSE NO. 1

DEPARTMENT	PERMIT TITLE
New York State	
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	State Historic Preservation Office Approval

Additional New York City Approvals

Permits and approvals required for the construction and operation of the Croton WTP the City include permits from the New York City Department of Parks and Recreation for work in the "vicinity" Van Cortlandt Park. Approvals from the New York City Landmarks Preservation Commission are also required for work in the vicinity of the Jerome Parke Reservoir.

The City will secure all applicable approvals necessary. All permits and approvals considered to be potentially required and the rationale for them will be made public.

4.9. APPROVALS AND PERMITS REQUIRED FOR JEROME PARK RESERVOIR

DEPARTMENT	PERMIT TITLE
New York State	
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	State Historic Preservation Office Approval

Additional New York City Approvals

Permits and approvals required for the construction and operation of the Croton Water Treatment Plant (WTP) within New York City include permits from the New York City Department of Parks and Recreation for work in the vicinity of the Jerome Park Reservoir and Van Cortlandt Park. Approvals from the New York City Landmarks Preservation Commission are also required for work in the vicinity of the Jerome Parke Reservoir.

The City will secure all applicable approvals necessary. All permits and approvals considered to be potentially required and the rationale for them will be made public.

5. ENVIRONMENTAL JUSTICE ANALYSIS

For the proposed Croton (WTP) project, the NYCDEP has prepared an environmental justice analysis in accordance with the New York State Department of Environmental Conservation, Policy CP-29 Environmental Justice and Permitting. The purpose of this policy, as issued by the NYSDEC on March 19, 2003, is to promote environmental justice and incorporate measures for achieving environmental justice into its programs, policies, regulations, legislative proposals and activities.

In order to assist the site selection decision-making process and as required concerning permits and approvals to be issued by the NYSDEC, this analysis has been added to the Final SEIS as Section 11.

The three water treatment plant alternatives were compared based on the balance of potential impacts and the distribution of minorities, ethnic groups, and income levels in the immediate study area and the reference communities.

All three of the potential project sites study areas include a minority population, with only the Mosholu and Harlem River Site' study areas including a low-income population. Mitigation measures, where appropriate and feasible, have been integrated into the proposed project to alleviate potential significant adverse impacts. Each of the integrated or proposed mitigation measures would serve as a benefit to the community and therefore, a disproportionate impact would not occur.

6. SUMMARY OF OTHER ALTERNATIVES INCLUDING THE NO BUILD

The Final SEIS provides a detailed description of numerous engineering alternatives that have been evaluated. This includes alternative treatment processes, alternative treated water conveyance plans, and the history of research on alternatives to filtration. The project has investigated many alternative sites since project planning began. The three sites considered here are preferred over those evaluated in the past environmental reviews.

The No Build alternative is not viable. It is explained in the section on Engineering Alternatives that because of a court ordered action, and the City's commitment to deliver high quality drinking water to all its customers, the No Build alternative is not a feasible alternative. The section on the Need for the Project describes this in detail and summarizes the City's continuing efforts to explore ways to improve water quality without filtration.

Significant adverse impacts predicted to occur as a result of the proposed water treatment plant at any of the sites would be similar. Construction related impacts on traffic, air quality, and noise would occur for a similar duration. A 5.5-year construction period is estimated at all three sites. The sites could experience potential significant adverse air quality impacts during construction. The truck traffic would be more intense at the Eastview Site, because barging would be possible at the Harlem River Site and the Mosholu Site has good access to the Major Deegan Expressway.

Potential significant adverse impacts on natural impacts would be more intense at the Harlem Site because filling of up to 1.5 acres of tidal wetlands would be required. On balance, a comparison of environmental impacts indicates that the three sites are comparable, and no site emerges as a potentially fully mitigated alternative.