A. INTRODUCTION

This chapter discusses the effects of the proposed action on the existing municipal systems serving the Hunts Point Water Pollution Control Plant (WPCP), including water supply, wastewater disposal, and solid waste disposal. The plant's current service needs and future demands (with and without the proposed action) are presented.

In addition to wastewater and solid waste, the Hunts Point WPCP generates sludge as part of the treatment process and receives sludge from other New York City wastewater treatment plants. As explained below, the transport and handling of this sludge is addressed through New York City's land-based sludge management program. Sludge quantities, storage, and handling at the plant under existing and future conditions are also discussed. The processing of sludge would be affected by the egg-shaped sludge digesters proposed to be constructed at the plant. Therefore, the infrastructure and solid waste analysis separately discusses the impacts of the new digesters (both the two-digester and four-digester scenarios).In addition, the carbon addition facility would increase the volume of sludge generated at the plant.

B. EXISTING CONDITIONS

WATER SUPPLY

New York City's water consumption rate during 2005 was 1.11 billion gallons of water per day. The per capita consumption rate in 2005 was 134 gallons per person per day. New York City's water supply consists of surface water from 19 reservoirs and three controlled lakes in a 1,972 square mile watershed, including the Catskill-Delaware watershed and the Croton watershed in upstate New York. An extensive network of reservoirs and aqueducts transports water from these watershed systems to New York City, where a grid of distribution pipes conveys the water to the users.

The existing water service connections to the plant are currently being replaced as part of the Phase I Upgrade (under construction) to ensure reliable water service to the facility. The water pipes, valves, and hydrants are being installed in accordance with New York City Department of Environmental Protection's (NYCDEP) Bureau of Water and Sewer Operations standards.

The current average water consumption rate at the plant is 2.6 million gallons per month. The majority of the water consumed at the plant is used for plant processes, including pump seal water and boiler make-up water; cleaning; and washing of process equipment. An estimated 2,200 gallons of water per day are used to meet the water demands of the approximately 90 employees at the site (based on an assumed consumption rate of 25 gallons per day per employee). The Phase I Upgrade, once completed, will not require additional water consumption at the plant.

WASTEWATER

As discussed in Chapter 1, "Project Description," the Hunts Point WPCP receives wastewater from portions of the Bronx, Rikers Island, City Island, and Hart Island. The plant's existing peak wet weather capacity has been increased to 400 million gallons per day (mgd) under the Phase I Upgrade. The 2005 average dry weather flow to the plant was 114 mgd. This represents a dramatic reduction in flows to the plant since the early 1990s, when dry weather flows approached 148 mgd. This flow reduction is due primarily to water conservation and flow reduction measures implemented by NYCDEP since the early 1990s.

In addition to the wastewater sent to the plant from the service area, wastewater is generated at the plant from the employees, equipment operation, and the treatment processes. This plant-generated wastewater is directed to the head of the plant and treated in the same manner as the influent from the plant's service area. Based on the plant's water consumption rate, it is estimated that the existing plant generates approximately 2.6 million gallons of wastewater per month.

STORMWATER

The existing stormwater drainage system for the Hunts Point WPCP site discharges to the waters of the East River adjacent to the plant. The plant has a State Pollutant Discharge Elimination System (SPDES) permit for onsite stormwater discharges. The Phase I and II Upgrades include improvements to the existing stormwater drainage system at the WPCP. As part of the Phase I Upgrade, a new plant drain system will redirect stormwater from the areas near the existing digesters and chemical fill stations to the plant's wet well for processing through the WPCP prior to discharge to the East River. The Phase I Upgrade will not increase the volume of stormwater at the plant since it will not add significant impervious surface area. The stormwater flow that will be diverted to the plant for treatment under the Phase I Upgrade for a 5-year storm is 7.7 mgd.

A separate SWPPP for construction has been prepared for the Phase I and II Upgrades to minimize impacts during the construction period.

SOLID WASTE

Solid waste is generated at the Hunts Point WPCP by plant employees and from the wastewater treatment process. The plant currently employs approximately 90 employees. The employees generate solid waste, including institutional waste and food waste. In addition to employee-generated waste, the wastewater treatment processes at the plant result in solid waste, such as grit, process scum, and screenings. The amount of solid waste produced by the WPCP recently increased slightly under the Phase I Upgrade, due to the improved removal of floatables from the influent. The plant (as upgraded under Phase I) generates solid waste associated with wastewater treatment processes (assuming a daily wastewater influent flow of 114 mgd) as follows: 6.3 cubic yards of screenings per day; 8.4 cubic yards of grit per day; and 2.2 cubic yards of scum per day.

Both the employee-generated solid waste and the solid waste related to the wastewater treatment process are transported by truck for off-site disposal. Current facility practices include the separation of recyclable materials from employee food waste.

SLUDGE

In addition to wastewater residuals discussed above (screenings, grit, and scum), the wastewater treatment process at the Hunts Point WPCP results in the production of sludge (e.g., solid, semi-solid, or liquid residue generated during the treatment of sewage). This sludge material is thickened, digested, and dewatered at the plant to reduce the volume of material. As explained in Chapter 1, "Project Description," sludge treatment at the plant currently includes the following: cyclone degritting of primary sludge, gravity thickening of combined waste activated and primary sludge, anaerobic digestion, and centrifuge dewatering. A sludge dewatering building was constructed at the Hunts Point WPCP during the 1990s to comply with the city's Sludge Management Program. Subsequent to treatment, the dewatered sludge is formed into sludge cake. If the sludge cake satisfies the criteria established in the U.S. Environmental Protection Agency's (EPA) Processes to Significantly Reduce Pathogens (PSRP) regulations, the sludge cake qualifies as "biosolids," which are wastewater residuals that have been treated and are suitable for land application. The sludge produced from the wastewater treatment process at the Hunts Point WPCP usually satisfies the PSRP regulations, but fails to meet PSRP at times due to low digester temperature, high sludge production and low detention times. For example, PSRP was met at the plant 335 days of calendar year 2006. Whether one or all tanks are not able to meet PSRP requirements, sludge production as a whole is considered to have failed PSRP requirements (i.e., the whole days' volume).

Sludge produced at other NYCDEP wastewater treatment plants in New York City is also brought to the Hunts Point WPCP for dewatering. The sludge from other plants is transported to the Hunts Point WPCP by barge and is treated and dewatered along with the sludge produced by the Hunts Point WPCP. Some of the off-site sludge, such as the sludge from the Newtown Creek WPCP, does not currently meet PSRP regulations and is therefore not suitable for land application. This sludge (once dewatered and formed into sludge cake) is trucked off-site to the New York Organic Fertilizer Company (NYOFCo) for appropriate processing.

The Phase I Upgrade includes repair and replacement of some of the sludge handling equipment, including replacement of the primary sludge pump and piping, architectural repairs to the primary sludge pump stations, and replacement of the degritting equipment, return activated sludge pump, waste activated sludge pump, and east effluent pump. Thickened and digested sludge from the Hunts Point plant, along with thickened and digested sludge from other facilities, is sent to the dewatering building. In 2004, the average on-site thickened sludge production was 148,200 dry pounds per day. The average production of dewatered sludge cake (which includes off-site sludge) was 185,960 dry pounds per day.

C. THE FUTURE WITHOUT THE PROPOSED ACTION

WATER SUPPLY

In the future without the proposed action, the Hunts Point WPCP will operate with the improvements that are being constructed for the Phase II Upgrade. These improvements will not significantly change the volume of water used for plant processes. A negligible amount of additional water will be needed for the increase in plant employees. The Phase II Upgrade will increase employment at the plant by approximately 14 people, for a total of approximately 104 employees. Assuming a water consumption rate of 25 gallons per day per person, a total of approximately 350 gallons of water will be consumed per day by the additional 14 employees for sanitary, drinking, and other uses.

WASTEWATER

Since the Phase II Upgrade would result in a negligible increase in water consumption for employee use and plant processes, the corresponding increase in wastewater in the future without the proposed action would also be negligible. The 2045 projected average daily dry weather flow from the plant service area to the plant is 124 mgd.

As discussed in Chapter 1, "Project Description," the Phase II Upgrade will result in an improvement to the quality of the wastewater due to the enhanced nitrogen removal. Therefore, while the quantity of wastewater would not increase in the future without the proposed action, the quality of the wastewater discharged to the East River will improve with respect to nitrogen levels.

STORMWATER

The volume of stormwater runoff from the plant will not increase with the Phase II Upgrade since the amount of impervious surface area will not substantially increase. As stated above, the Phases I and II Upgrades include an improved stormwater drainage system. Stormwater from any new Phase II Upgrade facilities that has the potential to be affected by plant operations will be routed to the head of the plant for treatment prior to discharge to the East River. Under the Phase II Upgrade, the stormwater flow that will be diverted to the plant for treatment for a 5-year storm is 5.0 mgd. A construction SWPPP was prepared for the Phase I and II Upgrades to minimize impacts during construction.

SOLID WASTE

The Phases II Upgrade will increase employment at the plant by approximately 14 people, for a total of 104 employees. The 14 additional employees will produce a negligible increase in solid waste. The wastewater treatment residuals (screenings, grit, and scum) will not increase under the Phase II Upgrade. Solid waste management and recycling practices at the plant will not change with the Phase II Upgrade.

SLUDGE

After completion of the Phase II Upgrade, the volume of sludge produced at the plant will increase as compared to existing conditions. The Full Step Feed BNR process (being constructed as part of the Phase II Upgrade) will change the rate of sludge production at the plant compared with the existing sludge production rate. The Full Step Feed BNR process will be operated at a higher sludge age (sludge age is a measure of the amount of time that solids reside in the aeration process), which will decrease the mass of waste activated sludge produced. The waste sludge from the Full Step Feed BNR process may not thicken as efficiently in the gravity thickeners due to filamentous bacterial growths and bulking sludge. The volume of sludge produced after the Full Step Feed BNR process is implemented may therefore increase due to a decrease in thickened sludge solids concentrations. Assuming a constant wastewater flow, the volume of sludge will increase with the Phase II Upgrade as compared to existing conditions, but the amount of solids (in dry pounds) will not increase. Subsequent to sludge digestion and dewatering, no change is expected to the amount of sludge cake produced at the facility. The projected plant thickened sludge production for the 2045 design year is 173,000 dry pounds per day. The average estimated production of dewatered sludge cake (which includes off-site sludge) would be 193,800 dry pounds per day. Under this scenario, the sludge produced from the wastewater treatment process at the Hunts Point WPCP would also usually satisfy the PSRP

regulations, but may fail to meet PSRP at times due to low digester temperature, high sludge production and low detention times.

In the future without the proposed action, residual solids from the Croton Water Treatment Plant at the Mosholu Site in Van Cortlandt Park in the Bronx may be transported to the Hunts Point WPCP. The anticipated year of operation for the Croton Water Treatment Plant is 2011. The material from the Croton Water Treatment Plant would consist of mixed floated solids (approximately 2 percent solids) from the plant's residuals handling facility, including waste backwash settled solids and floated solids. The design average mixed solids flow rate from the Croton Water Treatment Plant would be 121,000 gpd and the maximum would be 284,000 gpd. The mixed solids could be pumped approximately seven miles south from the Mosholu site to the Hunts Point WPCP, via a proposed six-inch force main. The mixed solids from the Croton Water Treatment Plant would be stored in the sludge storage tanks at the Hunts Point WPCP and sent to the dewatering facility.

D. PROBABLE IMPACTS OF THE PROPOSED ACTION

WATER SUPPLY

As part of the proposed action, a new digester gallery would be constructed. To remain in compliance with New York City Building Code, two separate water supply connections would be needed. One source would connect from Barretto Street to the digester gallery, and the second source would connect from Manida Street. No additional plant workers would be needed for the proposed action. No substantial increases in water supply needs would occur. Therefore, the proposed action would not result in any potential significant adverse impacts to the City's water supply system.

WASTEWATER

The proposed action would not result in an increase in the quantity of wastewater generated at the Hunts Point WPCP. The flow of wastewater from the plant service area to the Hunts Point WPCP would not change due to the proposed action. The proposed action would improve wastewater quality due to enhanced nitrogen removal. Therefore, the proposed action would not result in any potential significant adverse impacts to wastewater.

STORMWATER

As part of the proposed action, a plant drainage system would be designed to collect building floor drainage, wash water drainage, roof drainage, process and tank drains, and overflows in the area around the proposed digesters and all areas associated with the proposed action.

Storm drainage areas in the area of the egg-shaped digesters would be directed to the existing combined sewer system. The drainage system would be in accordance with all NYCDEP rules and regulations for sewer design and stormwater management and with the New York City Building Code. Stormwater conveyance facilities would be designed to accommodate a 10-year peak storm flow. New grades at the site would be sloped away from buildings and other structures, and any new roads would be sloped to drain into catch basins and inlets. The stormwater drainage system would be designed to maintain the rate of stormwater runoff from the site.

The proposed action would not significantly increase the volume of stormwater generated at the plant since the impervious surface area would not significantly increase. The general characteristics of the stormwater would not change as compared to the No Action condition. The existing construction SWPPP (prepared for construction of the Phase I and II Upgrades) would be modified for the proposed action construction activities. Therefore, no significant adverse impacts on stormwater runoff are projected.

SOLID WASTE

The quantity of solid waste generated at the Hunts Point WPCP after the completion of the proposed action would be the same as in the future without the proposed action. The solid waste management and recycling practices at the plant would not change with the proposed action. The wastewater treatment residuals (screenings, grit, and scum) would not increase under proposed action. Therefore, no significant adverse impacts on solid waste are projected.

SLUDGE

TWO-DIGESTER SCENARIO

The proposed action would include upgrades to the sludge handling systems at the Hunts Point WPCP (the Phase III Upgrade) as well as carbon and polymer addition facilities to enhance nitrogen removal. The projected 2045 plant thickened sludge production with carbon addition would be 198,000 dry pounds per day because carbon is an energy source that stimulates bacterial growth in the aeration tank, thereby creating more sludge. The average estimated production of dewatered sludge cake (which includes off-site sludge) would be 206,600 dry pounds per day. The project elements are described in detail in Chapter 1, “Project Description.” The proposed improvements related to sludge handling include the following:

- Construction of two new egg-shaped digesters and digester gallery, including sludge heat exchangers, transfer pumps, mixers, digester gas compressors and appurtenant equipment;
- Replacement of sludge collector mechanisms, pumps and piping for 10 thickeners; construction of new thickener control building;
- Renovation of existing digesters, including sealing of liners and roofs, modifying overflow boxes and miscellaneous improvements; and
- Renovation/replacement of existing sludge storage tanks, including new roofing and roof drains, and miscellaneous mechanical improvements.

With the Phase III Upgrade, the sludge treatment process would remain similar to the existing process; however, deteriorating equipment would be replaced. The egg-shaped sludge digesters proposed as part of the Phase III Upgrade would have several advantages as compared to the existing conventional digesters. The conventional digesters have a relatively flat profile and large liquid surface areas, which are prohibitive to uniform mixing. As a result, grit and floatable solids in the sludge often accumulate, thereby decreasing the usable volume and energy efficiency of the digesters. The steeply sloped bottoms of the egg-shaped digesters concentrate grit and solids at the bottom of the tank, providing for easier cleaning and more efficient mixing.

The new rehabilitated sludge treatment facilities would be designed to satisfy EPA’s PSRP regulations to allow the sludge to be beneficially reused for land application. The PSRP regulations for anaerobic sludge digestion include a minimum solids retention time of 15 days at

35 to 55 degrees Celsius and a 38 percent reduction in volatile suspended solids. The four existing digesters would not be capable of satisfying PSRP regulations under all operating conditions of the Full Step Feed BNR process with the projected 2045 flow of 124 mgd and increased sludge volume from carbon addition. If two new egg-shaped digesters are constructed and the four existing conventional digesters are renovated (as proposed with the Phase III Upgrade), the facility would be able to satisfy PSRP regulations with the projected 124 mgd under all conditions. The egg-shaped digesters and existing digesters will operate as a two stage process with the egg-shaped digesters as the first stage overflowing to the existing digesters as the second stage.

The proposed action would provide for improved and more efficient sludge treatment. As described above, the carbon addition facility would increase sludge production to 198,000 dry pounds per day. This additional sludge would be sent to the dewatering building. The average post-dewatering sludge cake (which includes off-site sludge) would increase to 206,200 pounds per day, resulting in the need for 2 more trucks to transport the additional sludge cake from the plant. Overall, the proposed action would not result in significant adverse impacts on the city's Sludge Management Program, including the handling, transport, and disposal of sludge materials.

FOUR-DIGESTER SCENARIO

Even after renovation under the proposed action, the four existing conventional digesters will ultimately reach the end of their useful life. Therefore, an additional two egg-shaped digesters (for a total of four) would be constructed once these digesters are no longer useful. The plant as upgraded under the four-digester scenario would be able to satisfy PSRP regulations with the projected sludge volumes. The four-digester scenario would not result in significant adverse impacts on the city's Sludge Management Program, including the handling, transport, and disposal of sludge materials. ✷