

A. INTRODUCTION

This chapter discusses the potential odor impacts from the Hunts Point Water Pollution Control Plant (WPCP) as upgraded under Phases I and II and the proposed action. The element of the proposed action that could affect odors is the addition of two egg-shaped digesters proposed as part of the Phase III Upgrade. Odor emissions from the digesters will be controlled with activated carbon adsorber systems (two odor control units per digester, one operating and one on stand-by) prior to discharge to the atmosphere through stacks. Under the proposed action, these stacks are the only additional sources that may generate odor. However, the analysis considered odor emissions from the entire plant.

Up to two additional digesters (for a total of four) may be required in the future to accommodate additional sludge production at the facility. Although these will not be constructed at this time, the additional digesters are considered and the potential odor impacts are assessed in this chapter (the four-digester scenario).

Between the issuance of the Draft Environmental Impact Statement (DEIS) and Final Environmental Impact Statement (FEIS), 10 out of the 12 sludge thickeners were modeled to account for reasonable worst-case operation, instead of 7 modeled in the DEIS, and revised estimates of the emissions for the sludge thickeners were employed in the updated analyses. The FEIS also notes that the NYCDEP will implement enclosure modifications to ensure 100 percent capture of fugitive emissions for three of the odor controlled systems to meet minimum requirements under the EPA Method 204 requirements for total enclosure. The three locations where this would be done are the primary influent channel, thickener distribution box, and sludge storage tank number 10. In addition, NYCDEP has committed to install odor control units on the primary effluent channels. This work is being included in the Phase III Upgrade. Furthermore, the odor modeling analysis was updated using the U.S. Environmental Protection Agency (EPA)'s AERMOD dispersion model.

B. METHODOLOGY.

INDICATOR COMPOUND

Many of the odor-causing compounds associated with wastewater facilities are sulfur-based compounds, such as hydrogen sulfide (H₂S), and mercaptans. Although there are many common odors associated with treatment plants, H₂S is the most prevalent malodorous gas associated with domestic wastewater collection and treatment. The conditions leading to H₂S formation usually favor the production of other odorous gases, such as ammonia and mercaptans, which may have considerably higher detectable odor thresholds, and consequently H₂S may be an indicator of their presence. H₂S is commonly used as a trace odor indicator and is employed for the following reasons:

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- It is always present in wastewater collection and treatment plant operations;
- It has a very unique, unpleasant, and discernable odor character (rotten eggs);
- It has a very low odor recognition threshold (approximately 4 to 5 parts per billion [ppb] by volume in air detected by the average person according to published reports);
- It is heavier than air, and will therefore accumulate in low-lying areas; and
- It can be monitored by hand-held and/or stationary instruments.

Therefore, for purposes of the odor impact assessment, H₂S was used as an indicator of potential off-site odors from the proposed action.

ODOR CRITERIA

The air quality standards and criteria used to assess odor impacts are the New York State Ambient Air Quality Standard (NYSAAQS) of 10 ppb H₂S in ambient air and the City Environmental Quality Review (CEQR) *Technical Manual* odor threshold of 1 ppb for H₂S at sensitive receptors. The 1-hour average NYSAQS of 10 ppb H₂S, applicable for all locations beyond the fence line of the Hunts Point WPCP, is used to protect the quality of life for the surrounding community. Implicit in the use of 1 ppb of H₂S as the significant odor threshold is that any control measures that may be needed to achieve this threshold will at the same time address other residual odors that are common to wastewater treatment plant operations, such as ammonia, amines, organic sulfides, mercaptans, indole, skatole, and aldehydes. Since the level is extremely low, and is at the lowest end of the detection range of currently available monitoring technology, compliance with this criterion is demonstrated with air dispersion models.

The WPCP as upgraded under Phases I and II and the proposed action, was modeled to predict the potential maximum 1-hour average H₂S levels using dispersion modeling to determine the compliance with the NYSAQS of 10 ppb at off-site receptor locations beyond the fence line and the CEQR impact threshold of 1 ppb at nearby sensitive receptors. The background levels of H₂S were assumed to be zero because there are no available H₂S background data. This is consistent with New York State Department of Environmental Conservation's (NYSDEC's) guidelines, which are outlined in *Air Guide-1*.

DISPERSION MODELING

Dispersion modeling was performed for the plant as upgraded under the multi-phase upgrade even though the only new sources with the potential to affect odor are the two new egg-shaped digesters proposed under the Phase III Upgrade.

MODEL SELECTION

Odor impacts were evaluated using the AERMOD model (version 07026) developed by EPA and described in the AERMOD Users Guide (USEPA 2004). Regulatory default model options were used. All pollutants were modeled using the urban option of the model. The AERMOD model was run both with and without the selection of the building downwash option.

EPA's Building Profile Input Program Plume Rise Model Enhancement (BPIP/PRIME) was used to determine the projected building dimensions for AERMOD modeling with the building downwash algorithm enabled. Modeling of downwash accounted for all obstructions within a radius equal to five obstruction heights of each stack.

METEOROLOGICAL DATA

The latest available five consecutive years of hourly surface data from LaGuardia Airport (2000 to 2004) with concurrent upper air data from Brookhaven, New York, were used. Surface characteristics were selected from LaGuardia Airport with a fetch distance of 3 kilometers and 30-degree sectors. An area weighted average was used to determine the albedo, bowen ratio, and surface roughness length for each of the 12 sectors. Data for the albedo, bowen ratio, and surface roughness length are given in Tables 4-1, 4-2b, and 4-3 of the EPA's User Guide for the AERMOD Meteorological Preprocessor (AERMET). The purpose of using such an extensive meteorological data set (almost 44,000 hours of meteorological data) is to ensure that a wide array of atmospheric conditions that include diurnal and seasonal variations, as well as inversion and convective conditions are evaluated when assessing the compliance of the facility emissions with air quality and odor standards criteria.

RECEPTOR NETWORK

The receptors used in the odor analysis included both Cartesian grid receptors and discrete Cartesian receptors. The receptor network included locations where highest concentrations would be expected, receptors at the plant property periphery, and receptors at selected locations in the surrounding neighborhood. A 2,000 by 1,500 meter Cartesian receptor grid extending from the center of the plant with 100 meter grid spacing was used. In addition to the Cartesian grid, discrete receptors were placed at 3.05-meter (10-foot) intervals along the Hunts Point WPCP fence line adjacent to the Barretto Point Park located northwest of the plant (similar to the fence line receptors used in the construction analysis in Chapter 17) and 25-meter intervals along the rest of the fence line. Additional receptors were placed at 10 locations within Barretto Point Park, at the 1.2-acre parcel that would be transferred to New York City Department of Parks and Recreation (NYCDPR) for inclusion in the Barretto Point Park when it is no longer needed for construction staging, and at several locations of the residences closest to the Hunts Point WPCP. For the 1.2-acre area, it was assumed that the landscape plan along the fenceline would contain a buffered area consistent with the landscape plan for the current Barretto Point Park (see Chapter 4, "Visual Character and Shadows"), and therefore receptors were placed based at 20 feet from the fenceline. Discrete sensitive receptors were also placed north of the facility up to three kilometers (km) away, at locations such as residences, schools, and churches, and the proposed greenway. All receptors were referenced to Universal Transverse Mercator (UTM) coordinates. Appendix 10 provides exhibits depicting discrete and sensitive receptors near the plant.

C. EXISTING CONDITIONS

The existing Hunts Point WPCP is located on an irregularly shaped site bounded by the East River to the south and west, Ryawa Street to the north, and Halleck Street to the east on the southern tip of the Hunts Point peninsula in the Bronx. As described in Chapter 2, "Land Use, Zoning, Neighborhood Character, and Open Space," the surrounding area is predominantly industrial, containing large- and small-scale uses. The largest uses are located along the industrial waterfront. The closest residence is located on Manida Avenue between East Bay and Viele Avenues at a distance of approximately 300 feet from the plant boundary. The construction of Barretto Point Park is also complete, and the park is now open to the public. Other sensitive receptor locations, such as schools, churches, and residences, are farther (approximately 900 to 10,000 feet) from the plant in the north- and northwest quadrants.

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Wastewater treatment at the plant currently consists of screening, primary settling, step aeration activated sludge, final settling and chlorination with sodium hypochlorite. The existing aeration tanks have been retrofitted with a Basic Step Feed Biological Nutrient Removal (BNR) process to provide an intermediate degree of nitrogen removal. Sludge treatment consists of cyclone degritting of primary sludge, gravity thickening of combined waste activated and primary sludge, anaerobic digestion and centrifuge dewatering. The facility also includes a dewatering building that processes sludge from the plant and accepts sludge from other NYCDEP plants by vessel. Centrate from the facility is recycled through the plant. Sludge cake, grit, scum and screenings are removed from the plant by truck for disposal off-site.

A number of odor control systems and improvements have been or are being constructed as part of the Phase I and II Upgrades to address odor-producing operations. H₂S emissions from a number of the sources at the Hunts Point WPCP will be reduced. Major improvements are summarized below:

- Exhaust air from the existing primary and secondary screen rooms will be treated with activated carbon adsorbers located in the proposed central residuals building. Existing grit and scum handling equipment will also be relocated to the central residuals building.
- Primary settling tank influent channels will be covered and exhaust air treated with activated carbon.

In addition, NYCDEP will implement enclosure modifications to ensure 100 percent capture of fugitive emissions for three of the odor controlled systems. This will include blocking off a portion of existing inlet air openings to increase the velocity through the opening to meet minimum requirements under the EPA Method 204 requirements for total enclosure. The three locations where this would be done are the primary influent channel, thickener distribution box, and sludge storage tank number 10. In addition, the primary effluent channels will be covered and odor controlled. This work is being included in the Phase III Upgrade.

ODOR COMPLAINTS

NYCDEP has been collecting and evaluating odor complaints associated with the WPCP. Each odor complaint is assessed and an action is taken. Odor complaints are called into the NYCDEP help line center at 311. The operator answering the telephone asks the complainant a series of questions designed to assist in following through on the complaint. These questions elicit details such as when the odor was smelled, the location where it occurred, and an opinion of what the odor smelled like. The call and information is then logged in and the operator completes a complaint form. The complaint form is faxed to the Watch Engineer on duty at the plant who conducts an in-plant odor survey to identify potential sources of odors. This is followed by an off-site inspection to identify the odor. The inspection is then documented in an odor complaint log. The complaint and resolution is sent to a central location at NYCDEP where a monthly report presenting all complaints received at the city's wastewater treatment plants and pumping stations is compiled.

The following summarizes odor complaints associated with the Hunts Point WPCP:

- The maximum complaints for all years occurred in the months of March through September.
- In 2006, there were 24 odor complaints from January through August, 4 of which may have come from the WPCP, and 20 of which may have come from the New York Organic Fertilizer Company (NYOFCo). Out of the 24 odor complaints, 14 either did not list an odor

description or described the odor as a foul or very strong smell, 7 were described as sewage or rotten eggs, 2 were described as chemical and 1 was described as horse manure.

- In 2005, there were 41 odor complaints from January through September. Of these, 25 either did not list an odor description or described the odor as a foul or strong smell, 4 had a description of chemical, 1 had a description of fertilizer, and 12 were described as sewage, garbage or a rotten egg smell.
- In 2004, there were four odor complaints. In 2003, there were six and from 1999 through 2002, there were one to two odor complaints per year.

The community odor surveys of the Hunts Point peninsula conducted by Malcolm Pirnie in November and December 2006 were a qualitative study to be used for informational purposes on the odors in the area. The findings were based on a snapshot in time. The community odor surveys did not quantify the odor emissions from any unit operations at the Hunts Point WPCP, and collection of the limited odor data during the study did not follow the rigorous procedures for quantitative analysis/data quality control that are required for use in a CEQR impact assessment. Therefore, this information could not be combined with data used in the DEIS.

The community odor surveys in November and December 2006 identified vehicle exhaust as the most predominant odor in the residential area. Odors from the Hunts Point WPCP (which still did not have all the odor mechanisms being installed under the Phase I Upgrade functioning at the time of the 2006 odor surveys) were localized along Ryawa Avenue and Halleck Street extension.

D. THE FUTURE WITHOUT THE PROPOSED ACTION

In the future without the proposed action, or the “No Action” condition, it is assumed that the existing plant will operate as upgraded under the Phase I and Phase II Upgrades. Phase II improvements are described in detail in Chapter 1, “Project Description.” This section describes the sources and scenarios under the future without the proposed action. Discussion of the sources modified under the proposed action, along with the predicted impacts of the entire plant as upgraded under the Phase I and II Upgrades and the proposed action, are provided later in this chapter, under “Probable Impacts of the Proposed Action.”

CONTROLLED SOURCES

Table 10-1 presents the controlled emission sources and stack parameters for the odor analysis.

SOURCE PARAMETERS AND EMISSION RATES

Source parameters and H₂S emission rates were modeled using the parameters and emission rates developed for the Phase II Upgrade based on a plant-wide H₂S and odor emissions inventory conducted in the Summer of 1999, plus the noted changes for the FEIS. Controlled sources at the WPCP under Phase I and II include the primary clarifier influent channels, three out of the five Sludge Storage Tanks (SST), the sludge distribution box serving the sludge thickeners, the digested sludge distribution box serving the existing digesters, the central residuals building, and the dewatering building. These controlled sources are discussed in more detail below.

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PRIMARY CLARIFIER INFLUENT CHANNEL ODOR CONTROL SYSTEM

There are six separate, dedicated influent channels for each of the six primary clarifiers. Each influent channel is covered and the exhaust air is treated with activated carbon through three carbon adsorbers, each with one stack, for a total of three stacks.

SLUDGE STORAGE TANKS

The facility uses four tanks for storing sludge produced on-site: Tanks 5, 6, 8, and 9. In addition, Tank 10 is used to store sludge barged from the Newtown Creek WPCP. Sludge storage tanks 5 and 6 are covered and have a six-foot-wide opening on the roof.

Table 10-1
Future Without the Proposed Action
H₂S Controlled Emission Sources and Stack Parameters

WPCP Odor Controlled Areas	Units Operating	Units Stand-by	No. of Stacks	Stk. Ht. (m)	H ₂ S Emission Rate (g/s)	Stk. Temp. (K)	St Exhaust Velocity (m/s)	Stack Diameter (m)
Primary Clarifier Influent Channel Odor Control System	3	0	3	3.05	5.01E-05/stack	288.65	0.03/stack	5.94/stack
Sludge Storage Tanks 5 and 6 ³	2	1	2 ⁽¹⁾	6.71	4.20E-05 ⁽⁴⁾	288.65	0.0095	1.8288
Sludge Storage Tank 10	1	0	1	9.6	2.80E-04	288.65	0.03	0.61
Sludge Distribution Box	1	0	1	3.66	2.00E-06	288.65	0.03	5.94
Digested Sludge Distribution Box	1	0	1	3.66	5.00E-05	288.65	0.03	5.94
Central Residuals Building Odor Control System Stacks 1 through 4	4	0	4	28.96	2.13E-04/stack	288.65	16.50/stack	0.76/stack
Central Residuals Building Odor Control System Stack 5	1	0	1	28.96	5.82E-04	288.65	13.80	1.37
Dewatering Building - Building Ventilation Odor Control System	4	1	4	21.34	5.30E-04 / 1.30E-04 / 3.30E-04 ⁽²⁾	288.65	24.05/stack	1.12/stack
Dewatering Building - Centrate Ventilation Two-Stage Odor Control System	2	1	2	16.31	1.90E-04	288.65	22.13/stack	0.28/stack

Notes:

- ⁽¹⁾ The entire sludge production from the plant is directed to one of the sludge storage tanks 5, 6, or 8. Typical sludge production rate of 76,000 ft³ per 24 hours translates into a displacement flow rate of 53 cfm. Thus one of the tanks (SST₆) will be modeled with that discharge rate, while the other tank (SST₅) will be assumed to have no emissions. SST₈ was modeled as an area source.
- ⁽²⁾ Only three of the building scrubbers are operated at any given time. Therefore, H₂S emissions will be assumed to be emitted from only three of the four building ventilation stacks. The H₂S emissions from three stacks vary. H₂S emissions from stack 1 are 5.30E-04 g/s, H₂S emission from Stack 2 are 1.30 E-04 g/s, and H₂S emission from Stack 4 are 3.30E-04 g/s.
- ⁽³⁾ These units are covered and therefore modeled as a point source; however, the exhaust is not controlled by an odor control unit.
- ⁽⁴⁾ Since H₂S concentrations from sludge storage tank 9 were higher than the concentrations measured from SST₆ and SST₈, to be conservative, the maximum concentration from SST₉ was used for these storage tanks.

Tanks 5, 6 and 8 contain dried sludge that has formed a deep floating crust with some cracks in the surface of the crust. The surface of the sludge in these tanks is not continuously moving which allows the crust to form. Under normal plant operations, these tanks would have this deep crust. The only time the crust would be removed is if the tank is cleaned, which occurs relatively infrequently. In addition, tanks would only be cleaned one at a time.

Sludge from tanks 5, 6, and 8 gets pumped into tank 9 and the sludge from this tank proceeds to dewatering. The sludge in tank 9 is a liquid because of the continuous slow circular motion in the tank. Since the sludge in tank 9 is in continuous motion, a crust does not form on the sludge

unlike the sludge in tanks 5, 6, and 8. H₂S emissions occur primarily through displacement of the air from within the tanks when they are being filled. The entire sludge production from the plant is directed to one of the tanks 5, 6, or 8. A typical sludge production rate of 76,000 cubic feet (ft³) per 24 hours translates into a displacement air flow rate of 53 cubic feet per minute (cfm). Thus, one of the tanks was modeled with that discharge rate (tank 6), while the other tank was assumed to have no emissions (tank 5). Since the H₂S concentrations measured at sludge storage tank 9 were higher than the concentrations measured at sludge storage tanks 5, 6, or 8, to be conservative, the maximum concentration from sludge storage tank 9 was used to determine the emission rate from sludge storage tanks 6 and 8.

Tanks 5 and 6 were modeled as two point sources. Stack heights were modeled equal to the tank heights and the diameter is equal to six feet. Stack velocity was calculated based on the air displacement caused by the maximum filling rate for the tanks. Sludge storage tanks 8 and 9 are open sludge storage tanks and therefore modeled as area sources. Sludge storage tank 10 is ducted to an activated carbon adsorber for emission control and therefore was modeled as a point source with one stack.

SLUDGE DISTRIBUTION BOX

The sludge distribution box serving the sludge thickeners are vented to an activated carbon adsorber for control of the emissions and were modeled as a point source with one stack.

DIGESTED SLUDGE DISTRIBUTION BOX

The digested sludge distribution box serving the existing digesters is vented to an activated carbon adsorber for control of the emissions and was modeled as a point source with one stack.

CENTRAL RESIDUALS BUILDING ODOR CONTROL SYSTEM

The central residuals building odor control system consists of five stacks, controlling the exhaust air from the existing primary and secondary screen rooms and existing grit and scum handling equipment. All five stacks are operating and were modeled as five point sources.

DEWATERING BUILDING ODOR CONTROL SYSTEM

All the dewatering building air is ducted to odor control systems. Six exhaust stacks have the potential to emit H₂S: four wet scrubber exhausts from the building ventilation systems; three operating and one on stand-by, and two two-stage scrubber exhausts from the centrate ventilation system, one operating and one on stand-by. Each stack was modeled as a point source.

UNCONTROLLED (AREA) SOURCES

The remaining uncontrolled odor sources at the WPCP include the primary clarifiers and weirs, the primary effluent channels, the secondary aeration tanks, the centrate tank, the final settling tanks, the sludge thickeners, sludge storage tanks 8 and 9 discussed above, and the return activated sludge channels.

Table 10-2 presents the uncontrolled emission sources and stack parameters for the odor analysis.

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PRIMARY CLARIFIERS AND WEIRS

There are six primary clarifiers at Hunts Point WPCP, each consisting of a large quiescent surface (main tank area) and effluent weirs (small overflow-type dam used to increase the oxygen content of the wastewater and to control the flow). Since the emission rates at the weirs are significantly higher than at the quiescent surface, the two parts are modeled separately. The quiescent portions of the six clarifiers are modeled as six separate area sources. The effluent weirs comprising the weirs and the associated collection channels and a quiescent portion, were modeled as six separate area sources.

Table 10-2
Future Without the Proposed Action
Hunts Point WPCP H₂S Uncontrolled Emission Sources

Source Description	Release Ht. (m)	H ₂ S Emission Rate (g/s-m ²)
Primary Clarifiers – 1 through 6	0.00	1.48E-07 / primary clarifier
Primary Clarifier Weirs – 1 through 6	0.00	5.46E-07 / primary clarifier weir
Primary Clarifier Effluent Channel - 1 through 18	0.00	3.39E-06 / effluent channel area source
Secondary Aeration Tanks – Tanks 1,2,3,5 and 6	0.00	1.07E-07 / aeration tank
Secondary Aeration Tank/Centrates Tank – Tank 4	0.00	6.32E-07
Final Settling Tanks – 1 through 8	0.00	9.10E-09 / final settling tank
Sludge Thickeners – 1 through 12 *	2.13	3.15E-07 / sludge thickener
Sludge Storage Tank No. 8	9.75	1.08E-06
Sludge Storage Tank No. 9	9.75	1.09E-06
Return Activated Sludge Channels – 1 through 16	0.00	4.78E-09 / RAS channel
Note: * Only 10 of the 12 sludge thickeners are modeled since only 10 are used during normal operations.		

PRIMARY CLARIFIER EFFLUENT CHANNEL

The effluent from the four western primary clarifiers flows into a 434-foot-long by 8-foot-wide effluent channel and the effluent from the eastern primary clarifiers flows into a 210-foot-long by 8-foot-wide effluent channel. The effluent channels were modeled as a series of 18 separate area sources due to the elongated shape of the channels. As discussed above, NYCDEP will be covering and odor controlling this source as part of the Phase III Upgrade.

SECONDARY AERATION TANKS

The Hunts Point WPCP has six secondary aeration tanks in a step-feed mode. One of the six tanks is normally used for separate centrate equalization. Aeration Tank No. 4 will be used as the centrate tank after Phase II of the upgrade is complete. Each aeration tank is comprised of four passes with return activated sludge (RAS), which is part of the settled material that is returned to the head of the aeration system to re-seed to new sewage entering the tank. The RAS is introduced in the first pass and one-third of the primary clarifier effluent introduced in each of the subsequent three passes. Each secondary aeration tank was modeled as an area source.

FINAL SETTLING TANKS

The eight final settling tanks were modeled as eight separate area sources, consisting of quiescent surfaces and effluent weirs. Since there is no significant emission difference between the quiescent surfaces and the weirs at final settling tanks, the two parts were modeled together.

The total emissions from both the quiescent surfaces and the weirs were modeled over the total surface area of each tank.

SLUDGE THICKENERS

Hunts Point WPCP has a total of 12 gravity thickeners (anaerobic digestion process to reduce the amount of organic matter and the number of microorganisms present in the solids). Each thickener was modeled as an open area source since the building in which they are located is widely open. For modeling purposes, only 10 of the sludge thickeners were assigned an emission rate based on the fact that only 10 thickeners are used during normal operations of the WPCP.

RETURN ACTIVATED SLUDGE CHANNELS

The RAS channels were modeled as 16 area sources.

E. PROBABLE IMPACTS OF THE PROPOSED ACTION

The proposed action is intended to improve the sludge treatment and solids handling facilities at the plant and to provide enhanced nitrogen removal. The proposed action is described in detail in Chapter 1, "Project Description." As discussed above, the entire plant as upgraded under the Phase I and II Upgrades and the proposed action was analyzed; although the only elements of the proposed action that could result in additional odor sources are the new egg-shaped digesters.

TWO-DIGESTER SCENARIO

MODELING ASSUMPTIONS

As part of the proposed action, two new egg-shaped digesters would be constructed to serve as primary digesters. The four existing conventional digesters would be renovated for use as second stage digesters (i.e., sludge would first enter the new egg-shaped digesters and then flow downstream to the renovated conventional digesters for additional digestion). Ten of the 12 existing sludge thickeners would be upgraded. The five existing sludge storage tanks would be renovated. Odor emissions would be controlled from each digester with activated carbon adsorber systems (two odor control units per digester, one operating and one on stand-by). Air from each digester would be collected through ductwork and transported by a fan to two single-bed carbon adsorption vessels. The treated air stream from each carbon adsorption vessel would then be discharged through a stack to the atmosphere. For the two new egg-shaped digesters, there would be a total of four activated carbon adsorption vessels exhausting out four stacks with two operating and two on stand-by. The stack exhaust emission rate from each of the odor control systems was determined assuming an H₂S concentration of 50 ppb at the stack exit height of 9.33-meters (30.6-feet). This is consistent with the maximum exhaust concentration from the existing digester overflow boxes odor control unit, which was based on values measured at the outlets of carbon adsorbers at Hunts Point WPCP and at similar units at the Newtown Creek WPCP. Physical source information for the new odor control units used to control potential odors from the new digesters was determined from manufacturer's data.

In addition, between the issuance of the DEIS and the FEIS, NYCDEP has committed to installing odor control in the primary effluent channels. The effluent from the four western primary clarifiers flows into a 434-foot-long by 8-foot-wide effluent channel, and the effluent from the eastern primary clarifiers flows into a 210-foot-long by 8-foot-wide effluent channel.

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Each effluent channel will be covered, and the exhaust air will be treated with activated carbon though two carbon adsorbers, each with one stack, for a total of two stacks.

The odor impacts assessment for the proposed action included the same controlled and uncontrolled sources as the Phase I and II Upgrade, with the addition of two egg digesters and activated carbon on the primary effluent channels. These new odor control units would be the only additional sources of H₂S being added to the facility under the proposed action.

Table 10-3 presents the stack parameters and emission rates for the two egg-shaped digesters and primary effluent channel odor control stacks.

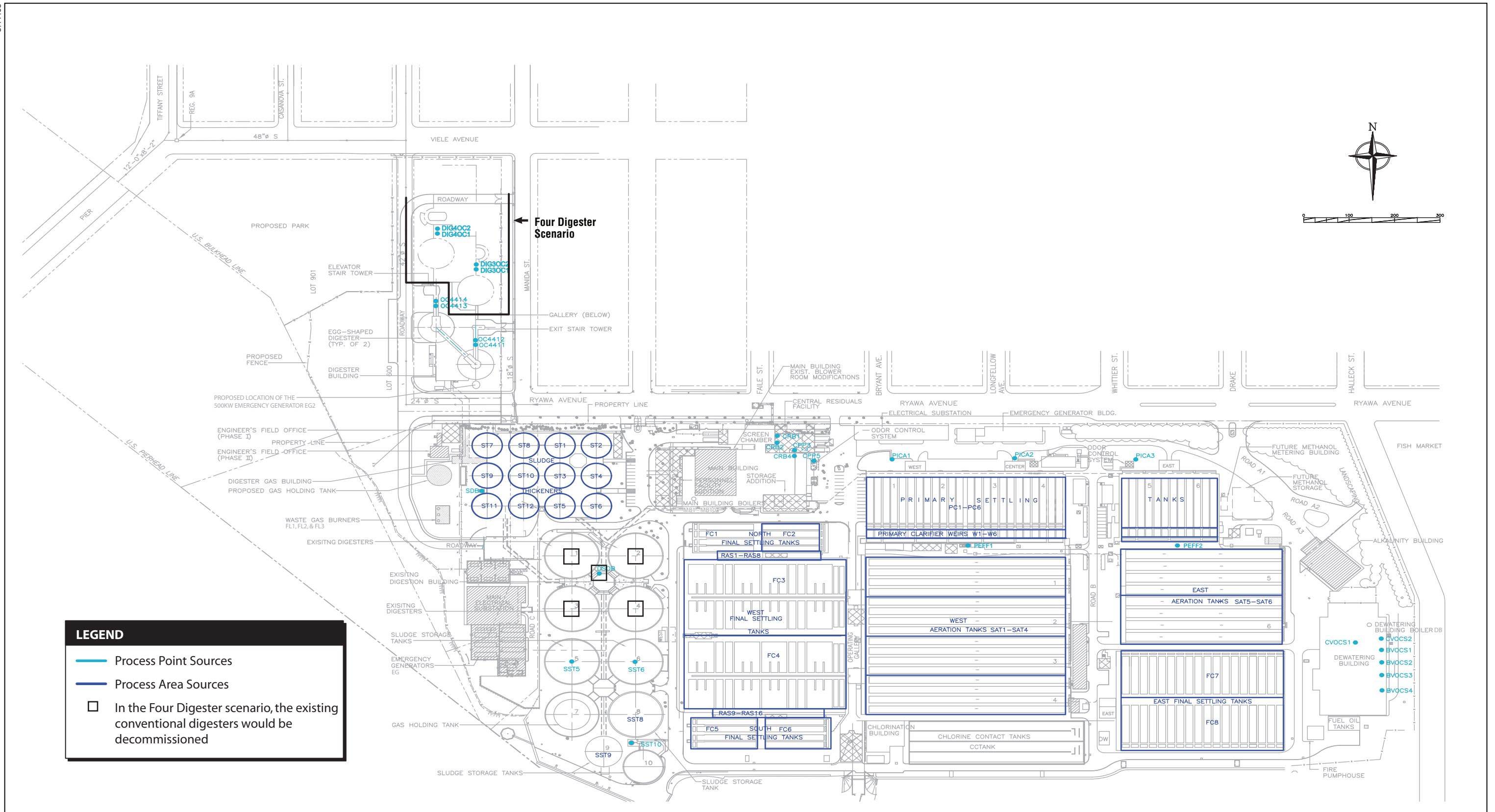
**Table 10-3
Future With the Proposed Action
H₂S Stack Parameters and Emission Rates**

WPCP Odor Controlled Areas	Units Operating	Units Stand-by	No. of Stacks	Stk. Ht. (m)	H ₂ S Emission Rate (g/s)	Stack Temp. (K)	Stack Exhaust Velocity (m/s)	Stack Diameter (m)
Proposed Action (Phase III Upgrade) Sources								
Egg Digester 1 Odor Control System ^{(1) (2)}	1	1	2	9.33	1.19E-05/ stack	308.15	0.001/stack	0.25/stack
Egg Digester 2 Odor Control System ^{(1) (2)}	1	1	2	9.33	1.19E-05/ stack	308.15	0.001/stack	0.25/stack
<u>Primary Effluent Channel Odor Control System^{(1) (3)}</u>	2	0	2	3.05	6.77E-05/ stack	288.65	0.03/stack	5.94
Notes:								
⁽¹⁾ New source proposed for Phase III.								
⁽²⁾ The odor control systems on the egg digesters will have 10-inch diameter exhaust stacks with rain caps. Per EPA guidance ¹ , the stacks, originally at 33.1 feet above grade, were reduced by three times the actual diameter (i.e., reduced by 2.5 feet to 30.6 feet or 9.33 meters) and the velocity was set at 0.001 m/s to simulate conditions influenced by the rain cap.								
⁽³⁾ <u>Between the issuance of the Draft and Final EISs, NYCDEP has committed to installing odor control on the primary effluent channels as part of the Phase III Upgrade.</u>								

These data along with the data from the plant as upgraded under Phases I and II were input into the model to determine the maximum H₂S concentration at each receptor for the specified averaging time (i.e., 1-hour for H₂S) for individual and combined sources. These modeled results were then compared to the *CEQR Technical Manual* odor threshold and NAAQS for H₂S to determine the potential for odor impacts from the multi-phase upgrade. Figure 10-1 presents all the process sources that are included in the odor modeling analysis for the two egg-shaped digester scenario under the proposed action.

No significant adverse impacts from the use of methanol and ethanol are expected. Methanol and ethanol would be stored in underground storage tanks. During filling, the tank vent would be connected back to the delivery tank (like is done with gasoline tanks at filling stations), to control emissions. Both methanol and ethanol are miscible in water. Methanol would be diluted with water to below its flammability limit before it is fed to the aeration tanks as a dilute solution. Based on the modeled impacts under the proposed action in Chapter 9, “Non-Criteria Air Pollutants,” no off-site odor impacts from the use of methanol or ethanol are expected.

¹ Memorandum from Joseph A. Tikvart, Chief – Source Receptor Analysis Branch, TSD (MD-14) to Ken Eng, Chief – Air Compliance Branch, Region II, “*Proposal for Calculating Plume Rise for Stacks with Horizontal Releases or Rain Caps for Cookson Pigment, Newark, New Jersey*”, July 9, 1993.



MODELING RESULTS

The proposed action would introduce two new egg-shaped digesters. However, to disclose the full impacts of the proposed action, odor impacts from the entire facility as upgraded under Phases I and II and the proposed action (with two new egg-shaped digesters) were determined and compared to the NYSAAQS and the CEQR guidance threshold. The planned plant improvements under Phases I and II were included in the analysis following the procedures described above. The odor control stacks were modeled as point sources while the uncovered process sources (i.e., uncovered tanks and channels) were modeled as area sources. The results of the modeling analysis are presented in Table 10-4.

**Table 10-4
Hunts Point WPCP Maximum 1-Hour Off-Site and Sensitive
Receptor Odor Impacts (ppb)**

Year ¹	Nearest Sensitive Receptor Impact (ppb)	Year ¹	Ambient Receptor Impact (ppb)
2001	0.97 ²	2001	2.69
Notes:			
1. Year of meteorological data with highest <u>predicted concentrations</u> from <u>AERMOD</u> modeling.			
2. 0.97 is the <u>maximum predicted concentration at a sensitive receptor (nearest place of public access in Barretto Point Park during park/amphitheater usage hours)</u>			

The results of the entire plant as upgraded under the Phase I and II Upgrades and the proposed action show that the maximum 1-hour average H₂S levels would comply with both the NYSAAQS of 10 ppb in ambient air and the NYCDEP CEQR threshold of 1 ppb at sensitive receptors.

Table 10-4 presents the maximum 1-hour H₂S impact at sensitive receptors and in ambient air. Utilizing the modeling changes described above for the FEIS, the plant as fully upgraded under the proposed action would result in a maximum predicted 1-hour H₂S concentration of 0.97 ppb in Barretto Point Park during park use hours, 0.50 ppb at the nearest residence on Manida Street, and 0.88 ppb at the Vernon C. Bain Center located to the east of the plant along the waterfront.

The maximum 1-hour off-site impact would be 2.69 ppb, which would occur on the southern fence line near the chlorine contact tanks and not in areas of public access. Figure 10-2 illustrates the location of this impact. These maximum predicted H₂S concentrations are well below the 10 ppb NYSAAQS off-site.

With the proposed action, the potential odor impacts along the Ryawa Avenue segment of the proposed greenway would 1.58. Potential odors emanating from the upgraded plant are not expected to be disruptive of the types of activities that would occur along the greenway. As discussed in the future without the proposed action, users of the greenway would spend only a limited time in any given area along the greenway. In addition, the number of hours with predicted impacts greater than 1 ppb along the greenway between the hours of 7 AM through 8 PM when the greenway is expected to be in use is 33 hours over five years, with a maximum of 10 hours per year.

Therefore, no potential significant adverse malodorous impacts are expected from the proposed action.



- Project Site Boundary
- Maximum Impact

FOUR-DIGESTER SCENARIO

Up to two additional digesters, for a total of four new digesters, may be required in the future to accommodate additional sludge production at the facility. Although these will not be constructed at this time, the additional digesters were analyzed as an additional future scenario. These two additional digesters would each have two activated carbon adsorber systems (two odor control units per digester, one operating and one stand-by) to control odor and H₂S emissions from the digesters. Each odor control unit would exhaust through its own stack, for a total of four additional exhaust stacks. The stack parameters and emission rates for each odor control system would be the same as the odor control system on the two egg-shaped digesters proposed under the proposed action, with an H₂S concentration of 50 ppb at the stack exit (see Table 10-3).

MODELING ASSUMPTION

Upon installation of the two additional odor control units, the four existing digesters will be removed, along with the existing odor control unit controlling odors from the digested sludge distribution box. All of the other sources used in the odor analysis for the proposed action, with the exception of the existing digested sludge distribution box odor control stack exhaust, are the same for the four-digester scenario. Figure 10-1 presents all the process sources that are included in the odor modeling analysis for the four-digester scenario.

MODELING RESULTS

The maximum predicted 1-hour H₂S levels at sensitive receptor locations under this scenario would be the same as the two-digester scenario. Therefore, odor impacts from the entire facility as upgraded under Phases I and II, and the proposed action (with four new egg-shaped digesters) would not result in any significant adverse odor impacts.

CONCLUSIONS

Odor analyses were updated for the FEIS for the proposed action and for a possible future condition with an additional two egg-shaped digesters and the decommissioning of the existing digesters (four-digester scenario). Using H₂S as an indicator compound for odorous compounds it was determined that the potential impacts from the entire plant as upgraded under Phases I and II Upgrades and the proposed action as well as the potential four-digester scenario would comply with the NYSAAQS of 10 ppb H₂S in ambient air. Maximum predicted 1-hour H₂S concentrations at the nearest residence, the Vernon C. Bain Detention Center, and at Barretto Point Park during park/amphitheater hours would be less than the 1 ppb significant odor guidance threshold in the City's CEQR Technical Manual. Potential odor impacts (1.58 ppb) on the Ryawa Avenue segment of the proposed South Bronx Greenway would not be disruptive of the types of activities that would occur along the greenway. Therefore, no potential significant adverse malodorous impacts are expected from either the proposed action or the four-digester scenario. *