

A. INTRODUCTION

This chapter assesses the potential for the Proposed Project to result in significant adverse air quality impacts. Air quality impacts result from emissions generated by stationary sources at a development site (direct impacts) or from off-site emissions associated with a project (indirect impacts). Examples of direct impacts include emissions from on-site fuel combustion for heating and hot water systems, while indirect impacts could be emissions from on-road vehicle trips generated by the Proposed Project or other changes to future traffic conditions due to a project.

As discussed in **Chapter 02.0, “Project Alternatives,”** there are three feasible alternatives under consideration for implementation of the Proposed Project. These include: Alternative 2 – the Rezoning Alternative; Alternative 3 – the Non-Rezoning Alternative; and Alternative 4 – the Midblock Bulk Alternative. A discussion of Alternative 5 – the Rehabilitation and Infill Alternative, which has been determined to be infeasible, is presented in **Chapter 05.22, “Rehabilitation and Infill Alternative Analysis.”** Refer to **Chapter 04.0, “Analysis Framework,” Table 04.0-4,** for information on the analysis approach for the three feasible alternatives for each technical area.

As discussed in **Chapter 05.13, “Transportation,”** the Proposed Project would increase traffic patterns and volumes in the general vicinity of the Project Sites. The potential effects of carbon monoxide (CO) and the particulate matter (PM) emissions from mobile source were determined. Potential air quality impacts associated with the Proposed Project’s accessory surface and below-grade parking facilities were also examined in this chapter to evaluate the potential for air quality impacts from mobile sources of emissions utilizing these facilities.

Heating and hot water services for the Fulton Houses Project Site are currently provided by a Con Edison steam system, while the Elliott-Chelsea Houses Project Site is served by two fossil fuel-fired boiler plants which are located at 427 W. 26th Street (the existing Elliott Houses 4 building) and 430 W. 26th Street (the existing Chelsea Houses 1 building). The proposed redevelopment of the Project Sites would utilize electric-powered heating and hot water systems. However, the existing boiler plants would continue to serve the existing Elliott-Chelsea Houses Project Site until all currently existing buildings connected to the plants are vacant. A portion of the Proposed Project would be completed and occupied before the existing boiler plants are shut down, but these new buildings would not tie into or utilize the existing boiler plants. Therefore, the temporary air quality effects from these existing boiler plants, at the location of the proposed Elliott-Chelsea 4 and/or Elliott-Chelsea 5 buildings, were evaluated.

In addition, an evaluation of emissions from existing manufacturing and processing uses within 400 feet of the Project Sites and their potential effects on the Proposed Project was conducted, as per the 2021 *City Environmental Quality Review Technical Manual (CTM)*. Large and major sources of emissions within 1,000 feet of the Project Sites were also examined, as required in the *CTM*.

The cumulative effects of emissions from the temporary air quality effects on the proposed Elliott-Chelsea Houses buildings from the existing boiler plants and large and major sources within 1,000 feet of the Elliott-Chelsea campus were also analyzed.

B. PRINCIPAL CONCLUSIONS

An analysis determined that the Proposed Project would not result in significant adverse air quality impacts due to mobile source or stationary source emissions under the three alternatives.

Under all three alternatives, an initial screening determined that projected hourly incremental traffic volumes generated by the Proposed Project would not exceed the *CTM* threshold for analysis of CO under any of the three alternatives. The initial screening also determined that that projected hourly incremental traffic volumes generated by the Proposed Project exceeded the *CTM* threshold for analysis of PM less than 2.5 microns in diameter (PM_{2.5}) at one intersection under the Rezoning Alternative and Midblock Bulk Alternative; therefore, potential effects of PM_{2.5} were evaluated for these alternatives, while under the Non-Rezoning Alternative, the number of project-generated vehicles were projected to be below the corresponding *CTM* threshold for mobile source analysis of PM_{2.5}, and thus no mobile source analysis was required. The quantified mobile source analysis determined that maximum concentration increments of PM_{2.5} from mobile sources under the Rezoning Alternative were projected to be lower than the corresponding *CTM de minimis* criteria, and because the project-generated traffic volumes for the Midblock Bulk Alternative were projected to be slightly lower than the Rezoning Alternative, no quantitative analysis of PM_{2.5} was performed for this alternative. In addition, an analysis of the proposed parking facilities found that there would be no significant adverse air quality impacts under any of the three alternatives under consideration for implementation by the Proposed Project.

Since the new buildings to be constructed at the Project Sites under all three alternatives would utilize electric-powered equipment for heating and hot water systems, no analysis was performed of the buildings, and no potential significant adverse air quality impacts would result from stationary sources of emissions. The exclusive use of electric-powered heating and hot water equipment is required for the Proposed Project and will be memorialized in a legally binding document between the New York City Housing Authority (NYCHA) and the Permanent Affordability Commitment Together (PACT) Partner.

The analysis of emissions from the existing NYCHA boiler plants on Proposed Project buildings on the Elliott-Chelsea Houses Project Site during construction determined that emissions would not result in a violation of applicable air quality standards under the Rezoning Alternative and Non-Rezoning Alternative. To ensure that there would be no significant adverse impacts on the Proposed Project under the three alternatives relative to nitrogen dioxide (NO₂), emissions of oxides of nitrogen (NO_x) from the Elliott-Chelsea Addition boilers would be limited to a maximum of 45 parts per million (ppm) and the stack height would be increased to a minimum of 145 feet. In addition, no outdoor rooftop amenity spaces would be permitted on the eastern, 13-story portion of the proposed Elliott-Chelsea 1 building, and no air intakes would be permitted within the area of this roof defined as a distance of less than 32.25 feet from the roof's edge facing 9th Avenue and less than 18 feet from the roof's edge facing W. 26th Street. These project improvements—which would be effective prior to occupancy of the proposed Elliott-Chelsea 1 building until the existing

NYCHA boiler plants are taken out of service—will be memorialized in a legally binding document between NYCHA and the PACT Partner.

Between the Draft Environmental Impact Statement (DEIS) and Final Environmental Impact Statement (FEIS), it is anticipated that additional analysis will be undertaken to examine potential alternate boiler and exhaust stack designs that would provide an equivalent level of protection in terms of air quality. In the event that alternate designs are determined to be feasible, the above project improvements would be updated.

In terms of industrial sources, no businesses of concern were found to have a New York State Department of Environmental Conservation (NYSDEC) air permit or New York City Department of Environmental Protection (DEP) certificate of operation within the study area, and no other potential sources of concern were identified; therefore, no potential significant adverse air quality impacts would occur on the Proposed Project from industrial sources under the three alternatives. In addition, the analysis of the existing large and major sources of emissions determined there would be no significant adverse air quality impacts on the Proposed Project under the three alternatives.

The analysis of the potential cumulative effects of the temporary air quality effects on the proposed Elliott-Chelsea Houses buildings from the existing NYCHA boiler plants and large and major sources of emissions within 1,000 feet of the Elliott-Chelsea Houses Project Site determined that these emissions would not cause a violation of applicable air quality standards on the on the Proposed Project under the Rezoning Alternative and Non-Rezoning Alternative.

C. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS

Air quality may be affected by air pollutants produced by motor vehicles, referred to as “mobile sources”; by fixed facilities, usually referenced as “stationary sources”; or by a combination or both. A proposed project may have effects on air quality during operation and/or construction.

Please see **Appendix I.1** for a complete description of the operational air quality analysis methodology.

Mobile Sources

To conduct a mobile source intersection analysis for each of the three alternatives, the projected number of project-generated vehicle trips was compared with the CO and/or PM analysis screening thresholds referenced in Section 211 of the *CTM*. Intersections in the traffic study area (see **Figure H.2-3a** in **Appendix H.2**) were reviewed for microscale analysis based on the *CTM* guidance.

The mobile source screening determined that the Proposed Project would not result in an increase in vehicle trips greater than the *CTM* screening threshold of 170 trips at any intersection under the Rezoning Alternative, Non-Rezoning Alternative, or Midblock Bulk Alternative; therefore, a mobile source intersection analysis was not required to evaluate CO concentrations. For PM_{2.5}, one intersection (10th Avenue and W. 17th Street) exceeded the threshold for the Rezoning and Midblock Bulk Alternatives based on heavy-duty truck equivalents, while no intersections

exceeded the threshold under the Non-Rezoning Alternative. Therefore, this intersection was selected for analysis of PM_{2.5}. However, because project-generated traffic volumes for the Rezoning Alternative are slightly higher than Midblock Bulk Alternative at the intersection of 10th Avenue and W. 17th Street, the mobile source analysis performed for the Rezoning Alternative is expected to result in similar air quality effects from mobile sources under the Midblock Bulk Alternative.

Traffic data for the intersection analysis were derived from existing traffic counts, projected future growth in traffic, and other information developed as part of the traffic analysis for the Proposed Project (see **Chapter 05.13**). Vehicular PM engine emission factors were computed using the United States (US) Environmental Protection Agency (EPA) mobile source emissions model, Motor Vehicle Emission Simulator (MOVES4).¹ The PM concentrations due to vehicular emissions adjacent to the analysis sites were predicted using the American Meteorological Society (AMS)/EPA Regulated Model (AERMOD) Version 23132.² Hourly traffic volumes and associated emission factors were used to estimate hourly emission rates from each modeled roadway segment and predict traffic-related air pollutant concentrations at receptor locations.

In addition, potential air quality impacts from the proposed 87-space below-grade parking garage under the Rezoning Alternative were analyzed. Potential air quality impacts from the parking garage under the Midblock Bulk Alternative would be identical.

Stationary Sources

The Proposed Project is anticipated to utilize electric-powered heating and hot water systems to provide heating and cooling and domestic hot water to the proposed buildings. No fossil fuel-fired heating and hot water equipment would be utilized. Therefore, no significant adverse air quality impacts would occur from stationary sources associated with the Proposed Project. However, the existing NYCHA boiler plants serving the Elliott-Chelsea Houses Project Site were evaluated to assess the potential for interim air quality effects on the Proposed Project under each alternative.

The potential impacts of existing industrial operations on pollutant concentrations at the Project Sites were also evaluated. Potential industrial air pollutant emission sources within 400 feet of the Project Sites were surveyed for inclusion in the air quality impact analyses, as recommended in the *CTM*. A review of land uses was performed to determine if there are any manufacturing or processing facilities within 400 feet of potential new sensitive receptors within the Project Sites. In addition, a search of Federal and State air permits, and the DEP's Bureau of Environmental Compliance (BEC) files, was performed to determine if there are permits for any sources of toxic air compounds from industrial processes. Based on the results of the industrial source evaluation, no emission sources were identified; therefore, no potential for significant adverse air quality impacts on the Proposed Project are anticipated from industrial source emissions.

¹ EPA. Motor Vehicle Emission Simulator (MOVES): User Guide for MOVES2014a. EPA420B15095. November 2015. Overview of EPA's Motor Vehicle Emission Simulator (MOVES4). EPA-420-R-23-019. August 2023. There is no stand-alone user's guide for MOVES4 as information is incorporated into the interface.

² EPA. User's Guide for the AMS/EPA Regulatory Model (AERMOD). Office of Air Quality Planning and Standards. EPA-454/B-23-008. Research Triangle Park, North Carolina. October 2023.

Finally, a review of NYSDEC Title V and State Facility Air permits was performed to identify any Federal or State-permitted facilities. Existing large and major sources of emissions (i.e., sources having a Title V or State Facility Air Permit) within 1,000 feet of the Project Sites were surveyed. One facility was identified within 1,000 feet of the Fulton Houses Project Site: the Starbucks Roastery, which has a State Facility Permit. One facility was identified within 1,000 feet of the Elliott-Chelsea Houses Project Site: Mutual Redevelopment Houses, which has a Title V Permit. Therefore, an analysis of potential air quality effects of such sources on the Proposed Project was performed for each alternative. Criteria pollutant concentrations were predicted using the AERMOD model. Concentrations of the air contaminants of concern were determined at ground level receptors as well as elevated receptors representing building floors of the Proposed Project for the three alternatives.

D. AFFECTED ENVIRONMENT

Regulatory Context

National Air Quality Standards

As required by the Clean Air Act (CAA), primary and secondary National Ambient Air Quality Standards (NAAQS) have been established³ for six major air pollutants: CO, NO₂, ozone, respirable PM [both PM_{2.5} and PM less than 10 microns in diameter (PM₁₀)], sulfur dioxide (SO₂), and lead. The primary standards represent levels that are requisite to protect the public health, allowing an adequate margin of safety. The secondary standards are intended to protect the nation's welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. The primary standards are generally either the same as the secondary standards or more restrictive. The NAAQS are presented in **Table 05.14-1**.

³ EPA. National Ambient Air Quality Standards. 40 CFR Part 50.

Table 05.14-1: National Ambient Air Quality Standards

Pollutant	Primary ppm	Primary $\mu\text{g}/\text{m}^3$	Secondary ppm	Secondary $\mu\text{g}/\text{m}^3$
Carbon Monoxide (CO)				
8-Hour Average	9 ⁽¹⁾	10,000	None	None
1-Hour Average	35 ⁽¹⁾	40,000	None	None
Lead				
Rolling 3-Month Average	NA	0.15	NA	0.15
Nitrogen Dioxide (NO₂)				
1-Hour Average ⁽²⁾	0.100	188	None	None
Annual Average	0.053	100	0.053	100
Ozone (O₃)				
8-Hour Average ⁽³⁾	0.070	140	0.070	140
Respirable Particulate Matter (PM₁₀)				
24-Hour Average ⁽⁷⁾	NA	150	NA	150
Fine Respirable Particulate Matter (PM_{2.5})				
Annual Mean ⁽⁴⁾⁽⁸⁾	NA	9	NA	15
24-Hour Average ⁽⁵⁾	NA	35	NA	35
Sulfur Dioxide (SO₂)				
1-Hour Average ⁽⁶⁾	0.075	196	NA	NA
Annual Average ⁽⁴⁾	NA	NA	0.010	26

Notes:

ppm – parts per million (unit of measure for gases only)

 $\mu\text{g}/\text{m}^3$ – micrograms per cubic meter (unit of measure for gases and particles, including lead)

NA – not applicable

All annual periods refer to calendar year.

Standards are defined in ppm. Approximately equivalent concentrations in $\mu\text{g}/\text{m}^3$ are presented.¹ Not to be exceeded more than once a year.² 3-year average of the annual 98th percentile daily maximum 1-hr average concentration.³ 3-year average of the annual fourth highest daily maximum 8-hr average concentration.⁴ 3-year average of annual mean.⁵ Not to be exceeded by the annual 98th percentile when averaged over 3 years.⁶ 3-year average of the annual 99th percentile daily maximum 1-hr average concentration.⁷ Not to be exceeded more than once a year on average over 3 years.⁸ EPA has lowered the NAAQS from 12 $\mu\text{g}/\text{m}^3$, effective March 6, 2024.**Source:** 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

Effective December 2015, EPA lowered the 2008 ozone NAAQS from 0.075 ppm to 0.070 ppm. EPA issued final area designations for the revised standard on April 30, 2018.

EPA has revised the NAAQS for PM_{2.5}, effective March 6, 2024. The revision included lowering the level of the annual PM_{2.5} primary standard from the current level of 12 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to 9 $\mu\text{g}/\text{m}^3$ and retaining the level of the 24-hr primary and secondary standard at 35 $\mu\text{g}/\text{m}^3$. In addition, the PM₁₀ 24-hour average primary and secondary standard was retained.

NAAQS Attainment Status and State Implementation Plans

The CAA, as amended in 1990, defines non-attainment areas (NAA) as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non-attainment by EPA, the state is required to develop and implement a State Implementation Plan (SIP), which delineates how a state plans to achieve air quality that meets the NAAQS

(“attainment”) under the deadlines established by the CAA, followed by a plan for maintaining attainment status once the area is in attainment.

In 2002, EPA re-designated New York City as in attainment for CO. Under the resulting maintenance plans, New York is committed to implementing site-specific control measures throughout the city to reduce CO levels, should unanticipated localized growth result in elevated CO levels during the maintenance period. The second CO maintenance plan for the region was approved by EPA on May 30, 2014.

Manhattan had been designated as a moderate NAA for PM₁₀. EPA clarified on July 29, 2015 that the designation only applied to the revoked form of the annual standard.

The five New York City counties and Nassau, Suffolk, Rockland, Westchester, and Orange Counties had been designated as a PM_{2.5} NAA⁴ since 2004 under the CAA due to exceedance of the 1997 annual average standard, and have also been determined as nonattainment with the 2006 24-hour PM_{2.5} NAAQS since November 2009. The area was redesignated as in attainment for the 2006 standard effective April 18, 2014 and is now under a maintenance plan. EPA lowered the annual average primary standard to 12 micrograms per cubic meter (µg/m³) effective March 2013. EPA designated the area as in attainment for the 12 µg/m³ NAAQS effective April 15, 2015.

As described above, EPA has revised the PM_{2.5} standard. PM_{2.5} attainment designations under the new standard are expected to be effective by April 2026. For areas designated as non-attainment, PM_{2.5} SIPs would be due by December 2027 and would be designed to meet the PM_{2.5} standard by December 2032, although this may be extended in some cases.

Effective June 15, 2004, EPA designated Nassau, Rockland, Suffolk, Westchester, and the five New York City counties as moderate non-attainment areas for the 1997 8-hour average ozone standard. In March 2008 EPA strengthened the 8-hour ozone standards, but certain requirements remain in areas that were either nonattainment or maintenance areas for the 1997 ozone standard (‘anti-backsliding’). EPA designated the same NAA as a marginal NAA for the 2008 ozone NAAQS, effective July 20, 2012, with subsequent reclassifications to “moderate” and “serious” nonattainment since compliance with the NAAQS was not achieved by the required attainment dates. On November 29, 2021, NYSDEC presented a demonstration that the New York Metro Area (NYMA) was not projected to meet the July 20, 2021 attainment deadline and therefore requested that EPA reclassify the NYMA to “severe” nonattainment. EPA reclassified the NYMA from “serious” to “severe” NAA, effective November 7, 2022, which imposed a new attainment deadline of July 20, 2027 (based on 2018–2020 monitored data). On April 30, 2018, EPA designated the same area as a moderate NAA for the revised 2015 ozone standard. EPA is currently reviewing revisions to New York’s SIP plan.

New York City is currently in attainment of the annual-average NO₂ standard. EPA has designated the entire state of New York as “unclassifiable/attainment” of the 1-hour NO₂ standard effective February 29, 2012. Since additional monitoring is required for the 1-hour standard, areas will be reclassified once three years of monitoring data are available.

⁴ New York Portion of the New York–Northern New Jersey–Long Island, NY–NJ–CT NAA.

EPA has established a 1-hour SO₂ standard, replacing the former 24-hour and annual standards, effective August 23, 2010. EPA has designated the entire State of New York as in attainment for this standard, with the exception of a portion of St. Lawrence County which was designated as “nonattainment.”

General Conformity

The general conformity requirements of the CAA and its implementing regulations (40 Code of Federal Regulations [CFR] part 93 Subpart B) limit the ability of Federal agencies to assist, fund, permit, and approve projects in non-attainment and maintenance areas where the action’s direct and indirect emissions have the potential to impact one or more of the six criteria air pollutants or their precursor pollutants at rates equal to or exceeding prescribed *de minimis* thresholds. For the Proposed Project, the prescribed annual rates are 25 tons per year (tpy) from either volatile compounds (VOCs) or NO_x (ozone precursors, for an ozone NAA within the ozone transport region) and 100 tpy of direct emissions of PM_{2.5} or PM_{2.5} precursors (for a PM_{2.5} maintenance area).

If annual emissions exceed one or more of the federal *de minimis* thresholds, a project may not conform to the requirements under the SIP and would require a full conformity determination be performed to ensure that the annual emissions have are included in the planning of the SIP. However, if no exceedance is identified, the project is assumed to conform to the SIP, and no further assessment is warranted.

New York State Air Quality Standards

The SO₂ NAAQS have been adopted as air quality standards for New York State, but are defined on a running 12-month basis rather than for calendar years only. In addition, New York State has standards for total suspended particles, settleable particles and 24-hour and annual SO₂, which correspond to federal standards that have since been revoked or replaced, and for the noncriteria pollutants fluoride and hydrogen sulfide.

Determining the Significance of Air Quality Impacts

The State Environmental Quality Review Act (SEQRA) regulations and the *CTM* state that the significance of a predicted consequence of a project (i.e., whether it is material, substantial, large or important) should be assessed in connection with its setting (e.g., urban or rural), its probability of occurrence, its duration, its irreversibility, its geographic scope, its magnitude, and the number of people affected. In terms of the magnitude of air quality impacts, any action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the concentrations defined by the NAAQS (see **Table 05.14-6**) would be deemed to have a potential significant adverse impact.

In addition, to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations would not be significantly increased in non-attainment areas, threshold levels have been defined for certain pollutants; any action predicted to increase the concentrations of

these pollutants above the thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

CO De Minimis Criteria

New York City has developed *de minimis* criteria to assess the significance of the increase in CO concentrations that would result from the impact of proposed projects or actions on mobile sources, as set forth in the *CTM*. These criteria set the minimum change in CO concentration that defines a significant environmental impact. Significant increases of CO concentrations in New York City are defined as:

An increase of 0.5 ppm or more in the maximum 8-hour average CO concentration at a location where the predicted No-Action 8-hour concentration is equal to or between 8 and 9 ppm; or

An increase of more than half the difference between baseline (i.e., No-Action) concentrations and the 8-hour standard, when No-Action concentrations are below 8 ppm.

PM_{2.5} De Minimis Criteria

In addition, New York City uses *de minimis* criteria to determine the potential for significant adverse PM_{2.5} impacts under the *CTM* are as follows:

Predicted increase of more than half the difference between the background concentration and the 24-hour standard;

Annual average PM_{2.5} concentration increments that are predicted to be greater than 0.1 µg/m³ at ground level on a neighborhood scale (i.e., the annual increase in concentration representing the average over an area of approximately 1 square kilometer, centered on the location where the maximum ground-level impact is predicted for stationary sources; or at a distance from a roadway corridor similar to the minimum distance defined for locating neighborhood scale monitoring stations); or;

Annual average PM_{2.5} concentration increments which are predicted to be greater than 0.3 µg/m³ at a discrete receptor location (elevated or ground level).

Actions under the *CTM* predicted to increase PM_{2.5} concentrations by more than the above *de minimis* criteria will be considered to have a potential significant adverse impact.

The above *de minimis* criteria have been used to evaluate the significance of predicted impacts of the Proposed Project on PM_{2.5} concentrations.

Existing Conditions

The representative criteria pollutant concentrations measured in recent years at NYSDEC air quality monitoring stations nearest to the Project Sites are presented in **Table 05.14-2**. The values presented are consistent with the form of the NAAQS. As shown in the table, the recently monitored levels did not exceed the NAAQS. It should be noted that these values are somewhat

different from the background concentrations used in the stationary source and mobile source analyses, since these are the most recent reported monitored values, rather than more conservative values used for dispersion modeling. The concentrations presented in **Table 05.14-2** provide a comparison of the air quality in the rezoning area with the NAAQS, while background concentrations are obtained from several years of monitoring data and represent a conservative estimate of the highest concentrations for future ambient conditions.

Table 05.14-2: Representative Monitored Ambient Air Quality Data

Pollutant	Location	Units	Averaging Period	Concentration	NAAQS
CO	CCNY, Manhattan	ppm	1-hour	1.55	35
CO	CCNY, Manhattan	ppm	8-hour	1.2	9
SO ₂	IS 52, Bronx ⁽¹⁾	µg/m ³	1-hour	9.5	196
PM ₁₀	IS 52, Bronx	µg/m ³	24-hour	35.3	150
PM _{2.5}	JHS 126, Brooklyn ^(2,3)	µg/m ³	Annual	8.1	9 ⁽⁸⁾
PM _{2.5}	JHS 126, Brooklyn ^(2,3)	µg/m ³	24-hour	20.1	35
NO ₂	IS 52, Bronx ^(4,5)	µg/m ³	1-hour	101.8	188
NO ₂	IS 52, Bronx ^(4,5)	µg/m ³	Annual	29.2	100
Lead	IS 52, Bronx ⁽⁶⁾	µg/m ³	3-month	0.0049	0.15
Ozone	IS52, Bronx ⁽⁷⁾	ppm	8-hour	0.068	0.075

Notes:

¹ The 1-hour value is based on a three-year average of the 99th percentile of daily maximum 1-hour average concentrations.

² Annual value is based on a three-year average of annual concentrations.

³ The 24-hour value is based on the three-year average of the 98th percentile of 24-hour average concentrations.

⁴ The 1-hour value is based on a three-year average of the 98th percentile of daily maximum 1-hour average concentrations.

⁵ Annual value based on a three-year maximum of annual concentrations.

⁶ Based on the highest quarterly average concentration measured during 2018 to 2020.

⁷ Based on the three-year average of the 4th highest daily maximum 8-hour average concentrations.

⁸ EPA has lowered the NAAQS from 12 µg/m³, effective March 6, 2024.

Source: New York State Air Quality Report Ambient Air Monitoring System, NYSDEC, 2021–2023.

E. ENVIRONMENTAL EFFECTS

A detailed description of the alternatives analyzed in this chapter is presented in **Chapter 02.0**.

Alternative 1 – No-Action Alternative

Mobile Source Analysis

In the future without the Proposed Project, traffic volumes would be higher than existing conditions, due to background growth and No-Action developments, but would be less than in the future with the Proposed Project. PM_{2.5} concentrations for the No-Action Alternative are not presented, since impacts are assessed on an incremental basis. The No-Action Alternative serves as a baseline for comparison of the effects of the other alternatives.

Stationary Source Analysis

In the 2041 No-Action Alternative, the Project Sites would remain in their existing condition and the existing fossil fuel-fired boiler plants would continue providing heating and hot water services to the Elliott-Chelsea Houses Project Site. Therefore, current emissions from heating and hot water systems at this site would be greater than in the future with the Proposed Project.

As discussed in **Chapter 05.12, “Energy,”** Con Edison and the Zero Carbon Mile Consortium, which consists of Reshape Strategies and Related Companies (and which is affiliated with the PACT Partner), are currently investigating a potential energy project which is independent of the Proposed Project but which may affect a portion of the Fulton Houses Project Site. As envisioned, it is the creation of a thermal energy network pilot project led by Con Edison that would capture and recycle heat from a data center, located within a commercial office building at 85 10th Avenue, located on the block bounded by W. 16th Street, 10th Avenue, W. 15th Street, and 11th Avenue. The heat would be used to provide heating, cooling, and domestic hot water services to some of the existing buildings at the Fulton Houses Project Site, located approximately 600 feet to the east, via a thermal energy main (Primary Ambient Loop) along W. 16th Street to a clean heat pump facility (Energy Center) to be built at select buildings at NYCHA’s Fulton Houses. Water-source variable refrigerant flow (VRF) systems at each of the affected buildings would connect to a Secondary Ambient Loop to provide both heating and cooling to the residents.

Alternative 2 – Rezoning Alternative

Mobile Source Analysis

Intersection Analysis

Using the methodology previously described in **Section C, “Methodology for Predicting Pollutant Concentrations,”** of this chapter and **Appendix I.1**, maximum predicted 24-hour and annual average PM_{2.5} concentration increments for the 2041 With-Action condition under the Rezoning Alternative were calculated so that they could be compared with the *de minimis* criteria. Based on this analysis, the maximum predicted localized 24-hour average and neighborhood-scale annual average incremental PM_{2.5} concentrations are presented in **Table 05.14-3**.

The results in **Table 05.14-3** show that the annual PM_{2.5} increments are predicted to be below the *de minimis* criteria at the analysis site.

Table 05.14-3: Maximum Predicted PM_{2.5} Incremental Concentrations (µg/m³) under the Rezoning Alternative

Analysis Site	Averaging Period	Maximum Increment	Criterion
10 th Avenue and W. 17 th Street	24-Hour	0.42	8.6 ⁽¹⁾
10 th Avenue and W. 17 th Street	Annual	0.022	0.1 ⁽²⁾

Notes:

µg/m³ = micrograms per cubic meter

¹ PM_{2.5} *de minimis* criterion—24-hour average, not to exceed more than half the difference between the background concentration of 17.8 µg/m³ and the 24-hour standard of 35 µg/m³.

² PM_{2.5} *de minimis* criterion—annual (neighborhood scale), 0.1 µg/m³.

Parking Analysis

Based on the methodology described in **Section C** of this chapter and **Appendix I.1**, the maximum predicted CO and PM concentrations from the proposed below-grade parking garage at the proposed Fulton 2 building were analyzed for the Rezoning Alternative, assuming a near side sidewalk receptor on the same side of the street (5 feet) as the parking facility, and a far side sidewalk receptor on the opposite side of the street from the parking facility.

The maximum predicted eight-hour average CO and PM_{2.5} concentrations of all the receptors modeled for the analyzed parking garage are presented in **Table 05.14-4**. The maximum predicted concentrations are substantially below the 1-hour and 8-hour standards of 35 ppm and 9 ppm, respectively, and the maximum predicted 8-hour concentration is below the *de minimis* CO criteria.

Table 05.14-4: Maximum Predicted Concentrations from Parking Garage under the Rezoning Alternative

Pollutant	Averaging Period	Receptor with Maximum Concentration	Garage Contribution	Background	Total Concentration	Criterion
CO	1-Hour	Building Receptor	0.045 ppm	2.52 ppm ⁽¹⁾	2.57 ppm	35 ppm
CO	8-Hour	Building Receptor	0.022 ppm	1.70 ppm ⁽¹⁾	1.72 ppm	9 ppm
PM _{2.5}	24-Hour	Building Receptor	0.172 µg/m ³	N/A ⁽²⁾	0.172 µg/m ³	8.6 µg/m ³
PM _{2.5}	Annual	Building Receptor	0.028 µg/m ³	N/A ⁽²⁾	0.028 µg/m ³	0.3 µg/m ³ ⁽³⁾

Notes:

µg/m³ = micrograms per cubic meter

¹ The CO background concentrations were measured at City College of New York (CCNY) during the period 2017-2019.

² PM_{2.5} concentrations are evaluated on an incremental basis; therefore, background concentration is not presented.

³ The annual average PM_{2.5} *de minimis* criterion for discrete receptors is 0.3 µg/m³.

As shown in the table, the maximum predicted CO concentrations are substantially below the applicable NAAQS and the *de minimis* CO criteria. The maximum predicted PM_{2.5} increments are below the respective PM_{2.5} *de minimis* criteria of 8.6 µg/m³ for the 24-hour average concentration and 0.3 µg/m³ for the annual average concentration. Therefore, the proposed parking facility would not result in any significant adverse air quality impacts from the Rezoning Alternative.

Stationary Source Analysis

Heating and Hot Water Systems

As previously discussed, all future buildings would be designed with electric-powered systems for space heating and domestic hot water. To ensure that the fossil fuel prohibitions for the Project Sites are enforced, project improvements will be memorialized in a legally binding document between NYCHA and the PACT Partner. With implementation of the project improvements outlined above, no significant adverse stationary source impacts would occur from the Proposed Project for the Rezoning Alternative.

Existing NYCHA Boiler Plants

Potential temporary stationary source impacts on the proposed Elliott-Chelsea 1 building from the existing boiler plants located at the existing Elliott-Chelsea Houses Project Site were determined using the AERMOD model. The maximum modeled concentrations were added to the background concentrations to estimate total concentrations on the Proposed Project. Total 1-hour NO₂ concentrations were determined following the refined EPA “Tier 3” approach described earlier. The results of the AERMOD analysis are presented in **Tables 05.14-5** for the Rezoning Alternative.

Table 05.14-5: Maximum Modeled Pollutant Concentrations from the Existing NYCHA Boiler Plants on the Proposed Project After Completion of Proposed Elliott-Chelsea 1 – Rezoning Alternative (µg/m³)

Pollutant	Averaging Period	Modeled Concentration	Background	Total Concentration	NAAQS
NO ₂	1-hour	169.1 ⁽¹⁾	- ⁽¹⁾	169.1	188
NO ₂	Annual	1.27	32.8 ⁽²⁾	34.1	100
PM _{2.5}	24-hour	1.93	17.8 ⁽³⁾	19.8	35
PM _{2.5}	Annual	0.16	7.6 ⁽³⁾	7.8	9 ⁽⁴⁾

Notes:

µg/m³ = micrograms per cubic meter

¹ The 1-hour NO₂ concentration presented represents the maximum of the total 98th percentile 1-hour NO₂ concentration predicted at any receptor using seasonal-hourly background concentrations. In addition, the background concentration is not presented since it is determined internally by the air dispersion model.

² Background concentration measured at IS 52 between 2017-2019.

³ Background concentration measured at JHS 126 between 2017-2019.

⁴ EPA has lowered the NAAQS from 12 µg/m³, effective March 6, 2024.

As shown in the above table, the predicted pollutant concentrations for all of the pollutant time averaging periods shown are below their respective NAAQS. Therefore, no potential for significant adverse air quality impacts on the Proposed Project from the existing NYCHA boiler plants sources is predicted for the Rezoning Alternative.

To ensure that there are no significant adverse air quality impacts on the Proposed Project at the Elliott-Chelsea Houses Project Site, project improvements will be memorialized in a legally binding document between NYCHA and the PACT Partner requiring a maximum emission rate of 45 ppm NO_x for the Elliott-Chelsea Addition boilers, and a minimum stack height of 145 feet above grade. In addition, no outdoor rooftop amenity spaces would be permitted on the eastern, 13-story portion of proposed Elliott-Chelsea 1 building and no air intakes would be permitted within the area of this roof defined as a distance of less than 32.25 feet from the roof edge facing 9th Avenue and less than 18 feet from the roof edge facing W. 26th Street. These project improvements would be effective prior to occupancy of the proposed Elliott-Chelsea 1 building until the existing NYCHA boiler plants are taken out of service. With implementation of the project improvements outlined above, no significant adverse stationary source impacts would occur on the Proposed Project for the Rezoning Alternative. Between the DEIS and FEIS, it is anticipated that additional analysis will be undertaken to examine potential alternate boiler and exhaust stack designs that would provide an equivalent level of protection in terms of air quality. As needed, following the Final EIS, further analysis may be performed, based on new information or technology, additional facts, or updated standards. In the event that alternate designs are determined to be feasible, the above project improvements would be updated.

Large and Major Sources

Potential stationary source impacts on the Fulton Houses Project Site from Starbucks Roastery and on the Elliott-Chelsea Houses Project Site from Mutual Redevelopment Houses were determined using the AERMOD model. The maximum modeled concentrations were added to the background concentrations to estimate total concentrations on the Proposed Project under the Rezoning Alternative. Total 1-hour NO₂ concentrations were determined following the refined EPA “Tier 3” approach described earlier for the NYCHA boiler plant analysis. The results of the AERMOD analysis are presented in **Table 05.14-6** and **Table 05.14-7** for the proposed Fulton and Elliott-Chelsea developments, respectively.

Table 05.14-6: Maximum Modeled Pollutant Concentrations from Starbucks Roastery on the Proposed Fulton Development for the Rezoning Alternative (µg/m³)

Pollutant	Averaging Period	Modeled Concentration	Background	Total Concentration	NAAQS
NO ₂	1-hour	105.7 ⁽¹⁾	- ⁽¹⁾	105.7	188
NO ₂	Annual	0.49	32.8 ⁽²⁾	33.3	100
SO ₂	1-hour	0.28	14.6 ⁽³⁾	14.9	196
PM _{2.5}	24-hour	0.29	17.8 ⁽⁴⁾	18.1	35
PM _{2.5}	Annual	0.03	7.6 ⁽⁴⁾	7.6	9 ⁽⁵⁾
PM ₁₀	24-hour	0.38	36 ⁽⁶⁾	36.4	150
Acrolein	1-hour	0.24	N/A	0.24	2.5
Acrolein	Annual	0.007	N/A	0.007	0.35
Acetaldehyde	1-hour	0.41	N/A	0.41	470
Acetaldehyde	Annual	0.013	N/A	0.013	0.45
Formaldehyde	1-hour	1.9	N/A	1.9	30
Formaldehyde	Annual	0.05	N/A	0.05	0.06

Notes:

µg/m³ = micrograms per cubic meter

N/A = not applicable

¹ The 1-hour NO₂ concentration presented represents the maximum of the total 98th percentile 1-hour NO₂ concentration predicted at any receptor using seasonal-hourly background concentrations. In addition, the background concentration is not presented since it is determined internally by the air dispersion model.

² Background concentration measured at IS 52 between 2017-2019.

³ Background concentration measured at IS 52 between 2017-2019.

⁴ Background concentration measured at JHS 126 between 2017-2019.

⁵ EPA has lowered the NAAQS from 12 µg/m³, effective March 6, 2024.

⁶ Background concentration measured at IS 52 between 2017-2019.

Table 05.14-7: Maximum Modeled Pollutant Concentrations from Mutual Redevelopment Houses on the Proposed Elliott-Chelsea Development for the Rezoning Alternative ($\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Period	Modeled Concentration	Background	Total Concentration	NAAQS
NO ₂	1-hour	160.7 ⁽¹⁾	- ⁽¹⁾	160.7	188
NO ₂	Annual	1.29	32.8 ⁽²⁾	34.1	100
SO ₂	1-hour	0.66	14.6 ⁽³⁾	15.2	196
PM _{2.5}	24-hour	1.27	17.8 ⁽⁴⁾	19.1	35
PM _{2.5}	Annual	0.04	7.6 ⁽⁴⁾	7.6	9 ⁽⁵⁾
PM ₁₀	24-hour	1.87	36 ⁽⁶⁾	37.9	150

Notes: $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

¹ The 1-hour NO₂ concentration presented represents the maximum of the total 98th percentile 1-hour NO₂ concentration predicted at any receptor using seasonal-hourly background concentrations. In addition, the background concentration is not presented since it is determined internally by the air dispersion model.

² Background concentration measured at IS 52 between 2017-2019.

³ Background concentration measured at IS 52 between 2017-2019.

⁴ Background concentration measured at JHS 126 between 2017-2019.

⁵ EPA has lowered the NAAQS from 12 $\mu\text{g}/\text{m}^3$, effective March 6, 2024.

⁶ Background concentration measured at IS 52 between 2017-2019.

As shown in **Tables 05.14-6 and 05.14-7**, the predicted pollutant concentrations for all of the pollutant time averaging periods shown are below their respective NAAQS. Therefore, no potential for significant adverse air quality impacts on the Proposed Project from the existing large and major sources is anticipated for the Rezoning Alternative.

Cumulative Emissions Assessment

The cumulative effects of emissions from the temporary air quality effects on the proposed Elliott-Chelsea Houses buildings from the existing NYCHA boiler plants and the Mutual Redevelopment Houses were determined using the AERMOD model. The maximum estimated concentrations from the modeling were added to the background concentrations to estimate total air quality concentrations. The results of the analysis are presented in **Table 05.14-8**.

Table 05.14-8: Maximum Modeled Pollutant Concentrations from the Existing NYCHA Boiler Plants and Mutual Redevelopment Houses on the Proposed Project After Completion of Proposed Elliott-Chelsea 1 – Rezoning Alternative ($\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Period	Modeled Concentration	Background	Total Concentration	NAAQS
NO ₂	1-hour	185.6 ⁽¹⁾	- ⁽¹⁾	185.6	188
NO ₂	Annual	1.95	32.8 ⁽²⁾	34.8	100
SO ₂	1-hour	1.89	14.6 ⁽³⁾	16.5	196
PM _{2.5}	24-hour	2.92	17.8 ⁽⁴⁾	20.7	35
PM _{2.5}	Annual	0.22	7.6 ⁽⁴⁾	7.8	9 ⁽⁵⁾
PM ₁₀	24-hour	4.19	36 ⁽⁶⁾	40.2	150

Notes: $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

¹ The 1-hour NO₂ concentration presented represents the maximum of the total 98th percentile 1-hour NO₂ concentration predicted at any receptor using seasonal-hourly background concentrations. In addition, the background concentration is not presented since it is determined internally by the air dispersion model.

² Background concentration measured at IS 52 between 2017-2019.

³ Background concentration measured at IS 52 between 2017-2019.

⁴ Background concentration measured at JHS 126 between 2017-2019.

⁵ EPA has lowered the NAAQS from 12 $\mu\text{g}/\text{m}^3$, effective March 6, 2024.

⁶ Background concentration measured at IS 52 between 2017-2019.

As shown in **Table 05.14-8**, the predicted pollutant concentrations for all of the pollutant time averaging periods shown are below their respective NAAQS. Therefore, no potential for significant adverse air quality impacts on the Elliott-Chelsea Houses buildings from the temporary cumulative effects of the existing NYCHA boiler plants and Mutual Redevelopment Houses is anticipated for the Rezoning Alternative. The same measures described above for the analysis of the NYCHA boiler plants would be sufficient to ensure that there are no significant adverse air quality impacts on the proposed project.

Alternative 3 – Non-Rezoning Alternative**Mobile Source Analysis****Intersection Analysis**

As discussed in **Section C**, the projected traffic generated by the Proposed Project under the Non-Rezoning Alternative does not warrant a detailed mobile source intersection analysis and therefore would not result in any significant adverse air quality impacts from mobile sources.

Parking Analysis

As discussed in **Appendix I.1**, the proposed parking generated by the Proposed Project under the Non-Rezoning Alternative does not warrant an analysis and therefore would not result in any significant adverse air quality impacts from mobile sources.

Stationary Source Analysis

Heating and Hot Water Systems

As previously discussed in **Section C**, all future buildings would be designed with electric-powered systems for space heating and domestic hot water. To ensure that the fossil fuel prohibitions for the Project Sites are enforced, project improvements will be memorialized in a legally binding document between NYCHA and the PACT Partner. With implementation of the project improvements outlined above, no significant adverse stationary source impacts would occur from the Proposed Project for the Non-Rezoning Alternative.

Existing NYCHA Boiler Plants

Potential temporary stationary source impacts on the proposed Elliott-Chelsea 1 building from existing NYCHA boiler plants at the Elliott-Chelsea Houses Project Site were determined using the AERMOD model. The maximum modeled concentrations were added to the background concentrations to estimate total concentrations on the Proposed Project. Total 1-hour NO₂ concentrations were determined following the refined EPA “Tier 3” approach described earlier. The results of the AERMOD analysis are presented in **Tables 05.14-9** for the Non-Rezoning Alternative.

Table 05.14-9: Maximum Modeled Pollutant Concentrations from the Existing NYCHA Boiler Plants After Completion of Proposed Elliott-Chelsea 1 – Non-Rezoning Alternative (µg/m³)

Pollutant	Averaging Period	Modeled Concentration	Background	Total Concentration	NAAQS
NO ₂	1-hour	169.1 ⁽¹⁾	- ⁽¹⁾	169.1	188
NO ₂	Annual	1.27	32.8 ⁽²⁾	34.1	100
PM _{2.5}	24-hour	1.93	17.8 ⁽³⁾	19.8	35
PM _{2.5}	Annual	0.16	7.6 ⁽³⁾	7.8	9 ⁽⁴⁾

Notes:

µg/m³ = micrograms per cubic meter

¹ The 1-hour NO₂ concentration presented represents the maximum of the total 98th percentile 1-hour NO₂ concentration predicted at any receptor using seasonal-hourly background concentrations. In addition, the background concentration is not presented since it is determined internally by the air dispersion model.

² Background concentration measured at IS 52 between 2017-2019.

³ Background concentration measured at JHS 126 between 2017-2019.

⁴ EPA has lowered the NAAQS from 12 µg/m³, effective March 6, 2024.

As shown in the above table, the predicted pollutant concentrations for all of the pollutant time averaging periods shown are below their respective NAAQS. Therefore, no potential for significant adverse air quality impacts on the Proposed Project from the existing boiler plants at the Elliott-Chelsea Houses Project Site sources is predicted for the Non-Rezoning Alternative.

To ensure that there are no significant adverse air quality impacts on the Proposed Project, project improvements will be memorialized in a legally binding document between NYCHA and the PACT Partner requiring a maximum emission rate of 45 ppm NO_x for the Elliott-Chelsea Addition boilers, and a minimum stack height of 145 feet. In addition, no outdoor rooftop amenity spaces would be permitted on the eastern, 13-story portion of proposed Elliott-Chelsea 1 building, and no air intakes would be permitted within the area of this roof defined as a distance of less than 32.25

feet from the roof's edge facing 9th Avenue and less than 18 feet from the roof's edge facing W. 26th Street. These project improvements would be effective prior to occupancy of the proposed Elliott-Chelsea 1 building until the existing NYCHA boiler plants are taken out of service. With implementation of the project improvements outlined above, no significant adverse stationary source impacts would occur on the Proposed Project for the Non-Rezoning Alternative. Between the DEIS and FEIS, it is anticipated that additional analysis will be undertaken to examine potential alternate boiler and exhaust stack designs that would provide an equivalent level of protection in terms of air quality. As needed, following the Final EIS, further analysis may be performed based on new information or technology, additional facts, or updated standards. In the event that alternate designs are determined to be feasible, the above project improvements would be updated.

Large and Major Sources

Potential stationary source impacts on the Fulton Houses Project Site from Starbucks Roastery and on the Elliott-Chelsea Houses Project Site from Mutual Redevelopment Houses were determined using the AERMOD model. The maximum modeled concentrations were added to the background concentrations to estimate total concentrations on the Proposed Project. Total 1-hour NO₂ concentrations were determined following the refined EPA "Tier 3" approach described earlier for the heating and hot water system analysis. The results of the AERMOD analysis are presented in **Tables 05.14-10 and 05.14-11** for the proposed Fulton and Elliott-Chelsea developments, respectively.

Table 05.14-10: Maximum Modeled Pollutant Concentrations from Starbucks Roastery on the Proposed Fulton Development (µg/m³)

Pollutant	Averaging Period	Modeled Concentration	Background	Total Concentration	NAAQS
NO ₂	1-hour	104.5 ⁽¹⁾	- ⁽¹⁾	104.5	188
NO ₂	Annual	0.45	32.8 ⁽²⁾	33.3	100
SO ₂	1-hour	0.3	14.6 ⁽³⁾	14.8	196
PM _{2.5}	24-hour	0.26	17.8 ⁽⁴⁾	18.1	35
PM _{2.5}	Annual	0.03	7.6 ⁽⁴⁾	7.6	9 ⁽⁵⁾
PM ₁₀	24-hour	0.31	36.0 ⁽⁶⁾	36.3	150
Acrolein	1-hour	0.21	N/A	0.21	2.5
Acrolein	Annual	0.006	N/A	0.006	0.35
Acetaldehyde	1-hour	0.36	N/A	0.36	470
Acetaldehyde	Annual	0.012	N/A	0.012	0.45
Formaldehyde	1-hour	1.7	N/A	1.7	30
Formaldehyde	Annual	0.05	N/A	0.05	0.06

Notes:

µg/m³ = micrograms per cubic meter

¹ The 1-hour NO₂ concentration presented represents the maximum of the total 98th percentile 1-hour NO₂ concentration predicted at any receptor using seasonal-hourly background concentrations. In addition, the background concentration is not presented since it is determined internally by the air dispersion model.

² Background concentration measured at IS 52 between 2017-2019.

³ Background concentration measured at IS 52 between 2017-2019.

⁴ Background concentration measured at JHS 126 between 2017-2019.

⁵ EPA has lowered the NAAQS from 12 µg/m³, effective March 6, 2024.

⁶ Background concentration measured at IS 52 between 2017-2019.

Table 05.14-11: Maximum Modeled Pollutant Concentrations from Mutual Redevelopment Houses on the Proposed Elliott-Chelsea Development ($\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Period	Modeled Concentration	Background	Total Concentration	NAAQS
NO ₂	1-hour	148.7 ⁽¹⁾	— ⁽¹⁾	148.7	188
NO ₂	Annual	0.96	32.8 ⁽²⁾	33.8	100
SO ₂	1-hour	0.52	14.6 ⁽³⁾	15.1	196
PM _{2.5}	24-hour	0.95	17.8 ⁽⁴⁾	18.8	35
PM _{2.5}	Annual	0.03	7.6 ⁽⁴⁾	7.6	9 ⁽⁵⁾
PM ₁₀	24-hour	1.39	36 ⁽⁶⁾	37.4	150

Notes: $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

N/A = not applicable

¹ The 1-hour NO₂ concentration presented represents the maximum of the total 98th percentile 1-hour NO₂ concentration predicted at any receptor using seasonal-hourly background concentrations. In addition, the background concentration is not presented since it is determined internally by the air dispersion model.

² Background concentration measured at IS 52 between 2017-2019.

³ Background concentration measured at IS 52 between 2017-2019.

⁴ Background concentration measured at JHS 126 between 2017-2019.

⁵ EPA has lowered the NAAQS from 12 $\mu\text{g}/\text{m}^3$, effective March 6, 2024.

⁶ Background concentration measured at IS 52 between 2017-2019.

As shown in **Tables 05.14-10 and 05.14-11**, the predicted pollutant concentrations for all of the pollutant time averaging periods shown are below their respective NAAQS. Therefore, no potential for significant adverse air quality impacts on the Proposed Project from the existing large and major sources is predicted for the Non-Rezoning Alternative.

Cumulative Emissions Assessment

The cumulative effects of emissions from the temporary air quality effects on the proposed Elliott-Chelsea Houses buildings from the existing NYCHA boiler plants and the Mutual Redevelopment Houses were determined using the AERMOD model. The maximum estimated concentrations from the modeling were added to the background concentrations to estimate total air quality concentrations. The results of the analysis are presented in **Table 05.14-12**.

Table 05.14-12: Maximum Modeled Pollutant Concentrations from the Existing NYCHA Boiler Plants and Mutual Redevelopment Houses on the Proposed Project After Completion of Proposed Elliott-Chelsea 1 – Non-Rezoning Alternative ($\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Period	Modeled Concentration	Background	Total Concentration	NAAQS
NO ₂	1-hour	185.6 ⁽¹⁾	- ⁽¹⁾	185.6	188
NO ₂	Annual	1.95	32.8 ⁽²⁾	34.8	100
SO ₂	1-hour	1.89	14.6 ⁽³⁾	16.5	196
PM _{2.5}	24-hour	2.92	17.8 ⁽⁴⁾	20.7	35
PM _{2.5}	Annual	0.22	7.6 ⁽⁴⁾	7.8	9 ⁽⁵⁾
PM ₁₀	24-hour	4.19	36 ⁽⁶⁾	40.2	150

Notes: $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

¹ The 1-hour NO₂ concentration presented represents the maximum of the total 98th percentile 1-hour NO₂ concentration predicted at any receptor using seasonal-hourly background concentrations. In addition, the background concentration is not presented since it is determined internally by the air dispersion model.

² Background concentration measured at IS 52 between 2017-2019.

³ Background concentration measured at IS 52 between 2017-2019.

⁴ Background concentration measured at JHS 126 between 2017-2019.

⁵ EPA has lowered the NAAQS from 12 $\mu\text{g}/\text{m}^3$, effective March 6, 2024.

⁶ Background concentration measured at IS 52 between 2017-2019.

As shown in **Table 05.14-12**, the predicted pollutant concentrations for all of the pollutant time averaging periods shown are below their respective NAAQS. Therefore, no potential for significant adverse air quality impacts on the Elliott-Chelsea Houses buildings from the temporary cumulative effects of the existing NYCHA boiler plants and Mutual Redevelopment Houses is anticipated for the Non-Rezoning Alternative. The same measures described above for the analysis of the NYCHA boiler plants would be sufficient to ensure that there are no significant adverse air quality impacts on the Proposed Project.

Alternative 4 – Midblock Bulk Alternative**Mobile Source Analysis****Intersection Analysis**

As discussed in **Section C**, the projected traffic generated by the Proposed Project under the Midblock Bulk Alternative would be almost identical to the traffic generated under the Rezoning Alternative. Therefore, like the Rezoning Alternative, the Midblock Bulk Alternative would not result in any significant adverse air quality impacts from mobile sources at any intersections.

Parking Analysis

As discussed in **Section C**, the proposed parking generated by the Proposed Project under the Midblock Bulk Alternative would result in projected trips into and out of the parking facility that are almost identical to the Rezoning Alternative. Therefore, like the Rezoning Alternative, the proposed parking facility would not result in any significant adverse air quality impacts from the Midblock Bulk Alternative.

Stationary Source Analysis

Heating and Hot Water Systems

As previously discussed, all future buildings would be designed with electric-powered systems for space heating and domestic hot water. To ensure that the fossil fuel prohibitions for the Project Sites are enforced, project improvements will be memorialized in a legally binding document between NYCHA and the PACT Partner. With implementation of the project improvements outlined above, no significant adverse stationary source impacts would occur from the Proposed Project for the Rezoning Alternative.

Existing NYCHA Boiler Plants

The Midblock Bulk Alternative conditions would be identical to the Rezoning Alternative on the Elliott-Chelsea Houses Project Site. Therefore, to ensure that there would be no significant adverse impacts resulting on the Proposed Project under the Midblock Bulk Alternative relative to NO₂, project improvements would be required to limit emissions of NO_x from the Elliott-Chelsea Addition plant boilers to a maximum of 45 ppm and a minimum stack height of 145 feet. In addition, no outdoor rooftop amenity spaces would be permitted on the eastern, 13-story portion of the proposed Elliott-Chelsea 1 building, and no air intakes would be permitted within the area of this roof defined as a distance of less than 32.25 feet from the roof's edge facing 9th Avenue and less than 18 feet from the roof's edge facing W. 26th Street. These project improvements would be effective prior to occupancy of the proposed Elliott-Chelsea 1 building until the existing NYCHA boiler plants are taken out of service. Between the Draft and Final EIS, it is anticipated that additional analysis will be undertaken to examine potential alternate boiler and exhaust stack designs that would provide an equivalent level of protection in terms of air quality. As needed, following the Final EIS, further analysis may be performed based on new information or technology, additional facts, or updated standards. In the event that alternate designs are determined to be feasible, the above project improvements would be updated.

Large and Major Sources

Potential stationary source impacts on the Fulton Houses Project Site from Starbucks Roastery were determined using the AERMOD model. The maximum modeled concentrations were added to the background concentrations to estimate total concentrations on the Proposed Project. Total 1-hour NO₂ concentrations were determined following the refined EPA "Tier 3" approach described earlier for the heating and hot water system analysis. The results of the AERMOD analysis are presented in **Tables 05.14-13**.

As shown in **Table 05.14-13**, the predicted pollutant concentrations for all of the pollutant time averaging periods shown are below their respective NAAQS. Therefore, no potential for significant adverse air quality impacts on the proposed project from the existing large and major sources is anticipated for the Midblock Bulk Alternative.

Table 05.14-13: Maximum Modeled Pollutant Concentrations from Starbucks Roastery on the Proposed Fulton Development for the Midblock Bulk Alternative ($\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Period	Modeled Concentration	Background	Total Concentration	NAAQS
NO ₂	1-Hour	105.4 ⁽¹⁾	- ⁽¹⁾	105	188
NO ₂	Annual	0.49	32.8 ⁽²⁾	33	100
SO ₂	1-Hour	0.26	14.6 ⁽³⁾	15	196
PM _{2.5}	24-Hour	0.29	17.8 ⁽⁴⁾	18	35
PM _{2.5}	Annual	0.03	7.6 ⁽⁴⁾	7.6	9 ⁽⁵⁾
PM ₁₀	24-Hour	0.37	36.0 ⁽⁶⁾	36	150
Acrolein	1-Hour	0.22	-	0.22	2.5
Acrolein	Annual	0.007	-	0.007	0.350
Acetaldehyde	1-Hour	0.36	-	0.36	470
Acetaldehyde	Annual	0.013	-	0.013	0.450
Formaldehyde	1-Hour	1.7	-	1.7	30
Formaldehyde	Annual	0.050	-	0.050	0.060

Notes:

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

¹ The 1-hour NO₂ concentration presented represents the maximum of the total 98th percentile 1-hour NO₂ concentration predicted at any receptor using seasonal-hourly background concentrations. In addition, the background concentration is not presented since it is determined internally by the air dispersion model.

² Background concentration measured at IS 52 between 2017-2019.

³ Background concentration measured at IS 52 between 2017-2019.

⁴ Background concentration measured at JHS 126 between 2017-2019.

⁵ EPA has lowered the NAAQS from 12 $\mu\text{g}/\text{m}^3$, effective March 6, 2024.

⁶ Background concentration measured at IS 52 between 2017-2019.