Chapter 8: Air Quality

A. INTRODUCTION

This chapter examines the potential for air quality impacts from a proposed retail development, located near the intersection of Forest Avenue and South Avenue in Staten Island (the proposed project). Direct impacts on air quality stem from emissions generated by stationary sources at a project site, such as emissions from on-site fuel combustion for heating and hot water systems. Indirect impacts include emissions from motor vehicle trips ("mobile sources") generated by a project or other changes to future traffic conditions due to a project.

With respect to mobile sources, the maximum projected hourly incremental traffic increments from the proposed project were predicted to exceed the 2014 *City Environmental Quality Review (CEQR) Technical Manual* carbon monoxide (CO) screening threshold of 170 peak hour trips at nearby intersections in the study area, but would not exceed the particulate matter (PM) emission screening threshold discussed in Chapter 17, Sections 210 and 311 of the *CEQR Technical Manual*. Therefore, a mobile source intersection analysis for the proposed project was performed for CO. In addition, the proposed project would provide new parking facilities; therefore, the mobile source analysis accounts for the additional impacts of CO and PM from these sources.

The proposed project includes fossil fuel-fired heating and hot water systems. Therefore, a stationary source analysis was conducted to evaluate potential future pollutant concentrations from these sources.

Per CEQR, air quality assessment determines both a proposed project's effects on ambient air quality as well as the effects of ambient air quality on the project. Since the project site is located within a manufacturing zoning district, an analysis of air toxics emissions from industrial sources was performed, as per the *CEQR Technical Manual*.

PRINCIPAL CONCLUSIONS

Based on the stationary source screening analysis that considered the effects of sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and PM emissions from the proposed project's combustion sources, there would be no potential significant adverse air quality impacts.

In addition, emissions from nearby industrial facilities would not result in impacts that would exceed the New York State Department of Environmental Conservation (NYSDEC) guideline concentrations for air toxic pollutants.

Concentrations of CO due to project-generated traffic at intersections near the project site would not result in any violations of National Ambient Air Quality Standards (NAAQS), nor would they exceed CEQR *de minimis* criteria. In addition, the proposed project's parking facility was found to result in no significant adverse air quality impacts.

B. POLLUTANTS FOR ANALYSIS

Ambient air quality is affected by air pollutants produced by both motor vehicles and stationary sources. Emissions from motor vehicles are referred to as mobile source emissions, while emissions from fixed facilities are referred to as stationary source emissions. Ambient concentrations of CO are predominantly influenced by mobile source emissions. PM, volatile organic compounds (VOCs), and nitrogen oxides (nitric oxide [NO] and NO_2, collectively referred to as NO_x) are emitted from both mobile and stationary sources. Fine PM is also formed when emissions of NO_x, sulfur oxides (SO_x), ammonia, organic compounds, and other gases react or condense in the atmosphere. Emissions of SO_2 are associated mainly with stationary sources, and some sources utilizing non-road diesel such as large international marine engines. On-road diesel vehicles currently contribute very little to SO_2 emissions since the sulfur content of on-road diesel fuel, which is federally regulated, is extremely low. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs. Ambient concentrations of CO, PM, NO_2, SO_2, ozone, and lead are regulated by the U.S. Environmental Protection Agency (USEPA) under the Clean Air Act (CAA), and are referred to as "criteria pollutants," emissions of VOCs, NO_x, and other precursors to criteria pollutants are also regulated by USEPA.

CARBON MONOXIDE

CO, a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. In urban areas, approximately 80 to 90 percent of CO emissions are from motor vehicles. CO concentrations can diminish rapidly over relatively short distances; elevated concentrations are usually limited to locations near crowded intersections, heavily traveled, and congested roadways, parking lots, and garages. Consequently, CO concentrations must be analyzed on a local (microscale) basis. Since the proposed project would result in peak hour vehicle trips that would exceed the *CEQR Technical Manual* screening analysis threshold for CO, a quantified assessment of air quality impacts from vehicle CO emissions was performed.

NITROGEN OXIDES, VOCS, AND OZONE

NO_x are of principal concern because of their role, together with VOCs, as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow, and occur as the pollutants are advected downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of NO_x and VOC emissions from all sources are therefore generally examined on a regional basis. The contribution of any action or project to regional emissions of these pollutants would include any added stationary or mobile source emissions.

The proposed project would not have a significant effect on the overall volume of vehicular travel in the metropolitan area; therefore, no measurable impact on regional NO_x emissions or on ozone levels is predicted. An analysis of project-related emissions of these pollutants from mobile sources was therefore not warranted.

In addition to being a precursor to the formation of ozone, NO_2 (one component of NO_x) is also a regulated pollutant. Since NO_2 is mostly formed from the transformation of NO in the atmosphere, it has mostly been of concern further downwind from large stationary point sources,

and is not a local concern from mobile sources. (NO_x emissions from fuel combustion are typically greater than 90 percent NO with the remaining fraction primarily NO_2 at the source.[1]) However, with the promulgation of the 2010 1-hour average standard for NO_2, local sources became of greater concern for this pollutant. Emissions of NO_2 were analyzed for No. 2 fuel oil-fired heating and hot water equipment associated with the proposed project.

LEAD

Airborne lead emissions are currently associated principally with industrial sources. Lead in gasoline has been banned under the CAA, and therefore, lead is not a pollutant of concern for the proposed project. Therefore, an analysis of this pollutant from stationary or mobile sources was not warranted.

RESPIRABLE PARTICULATE MATTER—PM_{10} AND $PM_{2.5}$

PM is a broad class of air pollutants that includes discrete particles of a wide range of sizes and chemical compositions, as either liquid droplets (aerosols) or solids suspended in the atmosphere. The constituents of PM are both numerous and varied, and they are emitted from a wide variety of sources (both natural and anthropogenic). Natural sources include the condensed and reacted forms of naturally occurring VOC; salt particles resulting from the evaporation of sea spray; wind-borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and material from live and decaying plant and animal life; particles eroded from beaches, soil, and rock; and particles emitted from volcanic and geothermal eruptions and from forest fires. Naturally occurring PM is generally greater than 2.5 micrometers in diameter. Major anthropogenic sources include the combustion of fossil fuels (e.g., vehicular exhaust, power generation, boilers, engines, and home heating), chemical, and manufacturing processes, all types of construction, agricultural activities, as well as wood-burning stoves and fireplaces. PM also acts as a substrate for the adsorption (accumulation of gases, liquids, or solutes on the surface of a solid or liquid) of other pollutants, often toxic, and some likely carcinogenic compounds.

As described below, PM is regulated in two size categories: particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$) and particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}, which includes $PM_{2.5}$). $PM_{2.5}$ has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorb to the surfaces of the particles, and is also extremely persistent in the atmosphere. $PM_{2.5}$ is mainly derived from combustion material that has volatilized and then condensed to form primary PM (often soon after the release from a source) or from precursor gases reacting in the atmosphere to form secondary PM.

All gasoline-powered and diesel-powered vehicles, especially heavy-duty trucks and buses operating on diesel fuel, are a significant source of respirable PM, most of which is $PM_{2.5}$; PM concentrations may, consequently, be locally elevated near roadways.

An analysis was conducted to assess the worst case PM impacts due to the fossil fuel-fired heating and hot water systems associated with the proposed project.

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[1] USEPA Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Section 1.3, Table 1.3-1.

SULFUR DIOXIDE

SO_2 emissions are primarily associated with the combustion of sulfur-containing fuels (oil and coal). SO_2 is also of concern as a precursor to $PM_{2.5}$ and is regulated as a $PM_{2.5}$ precursor under the New Source Review permitting program for large sources. Due to the federal restrictions on the sulfur content in diesel fuel for on-road and non-road vehicles, no significant quantities are emitted from vehicular sources. Vehicular sources of SO_2 are not significant and therefore, analysis of SO_2 from mobile sources was not warranted.

As part of the proposed project, No. 2 fuel oil would be burned in the proposed heating and hot water systems. Therefore, potential future levels of SO_2 from boilers were examined.

NON-CRITERIA POLLUTANTS

In addition to the criteria pollutants discussed above, non-criteria pollutants may be of concern. Non-criteria pollutants are emitted by a wide range of man-made and naturally occurring sources. These pollutants are sometimes referred to as hazardous air pollutants (HAP) and when emitted from mobile sources, as Mobile Source Air Toxics (MSATs). Emissions of non-criteria pollutants from industries are regulated by EPA.

Federal ambient air quality standards do not exist for non-criteria pollutants; however, NYSDEC has issued standards for certain non-criteria compounds, including beryllium, gaseous fluorides, and hydrogen sulfide. NYSDEC has also developed guideline concentrations for numerous non-criteria pollutants. The NYSDEC guidance document DAR-1[2] contains a compilation of annual and short-term (1-hour) guideline concentrations for these compounds. The NYSDEC guidance thresholds represent ambient levels that are considered safe for public exposure. EPA has also developed guidelines for assessing exposure to non-criteria pollutants. These exposure guidelines are used in health risk assessments to determine the potential effects to the public.

C. AIR QUALITY REGULATIONS, STANDARDS, AND BENCHMARKS

NATIONAL AND STATE AIR QUALITY STANDARDS

As required by the CAA, primary and secondary NAAQS have been established for six major air pollutants: CO, NO_2, ozone, respirable PM (both $PM_{2.5}$ and PM_{10}), SO_2, 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 8-1**. The NAAQS for CO, annual NO_2, and 3-hour SO_2 have also been adopted as the ambient air quality standards for New York State, but are defined on a running 12-month basis rather than for calendar years only. New York State also has standards for total suspended particles, settleable particles, non-methane hydrocarbons, 24-hour and annual SO_2, and ozone which correspond to federal standards that have since been revoked or replaced, and for the non-criteria pollutants beryllium, fluoride, and hydrogen sulfide.

[2] NYSDEC. DAR-1 (Air Guide-1) AGC/SGC Tables. April 2016.

Table 8-1
National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary		Secondary	
	ppm	µg/m³	ppm	µg/m³
Carbon Monoxide (CO)				
8-Hour Average	9(1)	10,000	None	
1-Hour Average	35(1)	40,000		
Lead				
Rolling 3-Month Average(2)	N/A	0.15	N/A	0.15
Nitrogen Dioxide (NO_2)				
1-Hour Average(3)	0.100	188	None	
Annual Average	0.053	100	0.053	100
Ozone (O_3)				
8-Hour Average(4,5)	0.070	140	0.070	140
Respirable Particulate Matter (PM_{10})				
24-Hour Average(1)	N/A	150	N/A	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Annual Mean(6)	N/A	12	N/A	15
24-Hour Average(7)	N/A	35	N/A	35
Sulfur Dioxide (SO_2)(8)				
1-Hour Average(9)	0.075	196	N/A	N/A
Maximum 3-Hour Average(1)	N/A	N/A	0.500	1,300

Notes:
Ppm—parts per million (unit of measure for gases only)
µg/m³—micrograms per cubic meter (unit of measure for gases and particles, including lead)
N/A—not applicable
All annual periods refer to calendar year
Standards are defined in ppm. Approximately equivalent concentrations in µg/m³ are presented
[1] Not to be exceeded more than once a year.
[2] USEPA has lowered the NAAQS down from 1.5 µg/m³, effective January 12, 2009.
[3] 3-year average of the annual 98th percentile daily maximum 1-hr average concentration. Effective April 12, 2010.
[4] 3-year average of the annual fourth highest daily maximum 8-hr average concentration.
[5] USEPA has lowered the NAAQS down from 0.070 ppm, effective December 2015.
[6] 3-year average of annual mean. EPA has lowered the primary standard from 15 µg/m³, effective March 2013.
[7] Not to be exceeded by the annual 98th percentile when averaged over 3 years.
[8] USEPA revoked the 24-hour and annual primary standards, replacing them with a 1-hour average standard. Effective August 23, 2010.
[9] 3-year average of the annual 99th percentile daily maximum 1-hr average concentration.
Source:
40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

USEPA has revised the NAAQS for PM, effective December 18, 2006. The revision included lowering the level of the 24-hour $PM_{2.5}$ standard from 65 µg/m³ to 35 µg/m³ and retaining the level of the annual standard at 15 µg/m³. The PM_{10} 24-hour average standard was retained and the annual average PM_{10} standard was revoked. USEPA later lowered the primary annual $PM_{2.5}$ average standard from 15 µg/m³ to 12 µg/m³, effective March 2013.

USEPA has also revised the 8-hour ozone standard, lowering it from 0.08 to 0.075 parts per million (ppm), effective as of May 2008, and the previous 1997 ozone standard was fully revoked effective April 1, 2015. Effective December 2015, USEPA further reduced the 2008

ozone NAAQS, lowering the primary and secondary NAAQS from the current 0.075 ppm to 0.070. USEPA expects to issue final area designations by October 1, 2017; those designations likely would be based on 2014-2016 air quality data.

USEPA lowered the primary and secondary standards for lead to 0.15 $\mu g/m^3$, effective January 12, 2009. USEPA revised the averaging time to a rolling 3-month average and the form of the standard to not-to-exceed across a 3-year span.

USEPA established a 1-hour average NO_2 standard of 0.100 ppm, effective April 12, 2010, in addition to the annual standard. The statistical form is the 3-year average of the 98th percentile of daily maximum 1-hour average concentration in a year.

USEPA also established a 1-hour average SO_2 standard of 0.075 ppm, replacing the 24-hour and annual primary standards, effective August 23, 2010. The statistical form is the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour concentrations (the 4th highest daily maximum corresponds approximately to 99th percentile for a year.)

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 USEPA, 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 under the deadlines established by the CAA, followed by a plan for maintaining attainment status once the area is in attainment.

In 2002, USEPA re-designated New York City as in attainment for CO. Under the resulting maintenance plans, New York City 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 USEPA on May 30, 2014.

The five New York City counties and Nassau, Suffolk, Rockland, Westchester, and Orange Counties which had been designated as a $PM_{2.5}$ NAA (New York Portion of the New York–Northern New Jersey–Long Island, NY–NJ–CT NAA) was redesignated as in attainment for the standard on April 18, 2014, and is now under a maintenance plan. USEPA designated the area as in attainment for the new 12 $\mu g/m^3$ NAAQS effective April 15, 2015.

Effective June 15, 2004, USEPA designated Nassau, Rockland, Suffolk, Westchester, and the five New York City counties as in moderate non-attainment for the 1997 8-hour average ozone standard. In March 2008 USEPA strengthened the 8-hour ozone standards. USEPA designated these same areas as a marginal NAA for the 2008 ozone NAAQS, effective July 20, 2012. On April 11, 2016, as requested by New York State, USEPA reclassified the area as a moderate NAA. New York State began submitting SIP documents in December 2014. The state is expected to be able to meet its SIP obligations for both the 1997 and 2008 standards by satisfying the requirements for a moderate area attainment plan for the 2008 ozone NAAQS.

New York City is currently in attainment of the annual-average NO_2 standard. USEPA has designated the entire state of New York as "unclassifiable/attainment" of the 1-hour NO_2 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 (likely 2017).

USEPA has established a 1-hour SO_2 standard, replacing the former 24-hour and annual standards, effective August 23, 2010. Based on the available monitoring data, all New York State counties currently meet the 1-hour standard. Additional monitoring will be required. Draft attainment designations were published by USEPA in February 2013, indicating that USEPA is deferring action to designate areas in New York State and expects to proceed with designations once additional monitoring data are gathered.

DETERMINING THE SIGNIFICANCE OF AIR QUALITY IMPACTS

The State Environmental Quality Review Act (SEQRA) regulations and the *CEQR Technical Manual* 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.[3] 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 13-1) 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 will 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 *CEQR Technical Manual*. 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: (1) 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 (2) 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 8.0 ppm.

$PM_{2.5}$ DE MINIMIS CRITERIA

New York City uses *de minimis* criteria to determine the potential for significant adverse $PM_{2.5}$ impacts under CEQR 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 which are predicted to be greater than 0.1 $\mu g/m^3$ 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

[3] New York City. *CEQR Technical Manual*. Chapter 1, section 222. March 2014; and New York State Environmental Quality Review Regulations, 6 NYCRR § 617.7

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 $\mu g/m^3$ at a discrete receptor location (elevated or ground level).

Actions 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.

D. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS

MOBILE SOURCES

The prediction of vehicle-generated emissions and their dispersion in an urban environment incorporates meteorological phenomena, traffic conditions, and physical configuration. Air pollutant dispersion models mathematically simulate how traffic, meteorology, and physical configuration combine to affect pollutant concentrations. The mathematical expressions and formulations contained in the various models attempt to describe an extremely complex physical phenomenon as closely as possible. However, because all models contain simplifications and approximations of actual conditions and interactions, and since it is necessary to predict the reasonable worst-case condition, most dispersion analyses predict conservatively high concentrations of pollutants, particularly under adverse meteorological conditions.

The mobile source analyses for the proposed project employ models approved by USEPA that have been widely used for evaluating air quality impacts of projects in New York City, other parts of New York State, and throughout the country. The modeling approach includes a series of conservative assumptions relating to meteorology, traffic, and background concentration levels, resulting in a conservatively high estimate of expected pollutant concentrations that could ensue from the proposed project.

An analysis of mobile source air quality impacts due to the proposed project was performed for selected intersections in the traffic study area (see Chapter 7, "Transportation"); an analysis of the proposed project's parking facilities was also performed. The results of these analyses are discussed in section G, "the Future with the Proposed Project."

VEHICLE EMISSIONS

Engine Emissions

Vehicular CO engine emission factors were computed using the USEPA mobile source emissions model, MOVES2014a.[4] This emissions model is capable of calculating engine emission factors for various vehicle types, based on the fuel type (gasoline, diesel, or natural gas), meteorological conditions, vehicle speeds, vehicle age, roadway types, number of starts per day, engine soak time, and various other factors that influence emissions, such as inspection maintenance programs. The inputs and use of MOVES incorporate the most current guidance available from the New York State Department of Environmental Conservation (NYSDEC).

[4] USEPA. *Motor Vehicle Emission Simulator (MOVES): User Guide for MOVES2014a*. November 2015.

Vehicle classification data were based on field studies. Appropriate credits were used to accurately reflect the inspection and maintenance program.[5] County-specific hourly temperature and relative humidity data obtained from NYSDEC were used.

TRAFFIC DATA

Traffic data for the air quality 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 7, "Transportation"). Traffic data for the future without and with the proposed project were employed in the respective air quality modeling scenarios. The weekday midday (1:00 to 2:00 PM) and evening (5:00 to 6:00 PM) peak periods, and the Saturday midday (1:00 to 2:00 PM) peak period were analyzed for $PM_{2.5}$. These time periods were selected for the mobile source analysis because they produce the maximum anticipated project-generated traffic, and therefore have the greatest potential for significant air quality impacts.

DISPERSION MODEL FOR MICROSCALE ANALYSES

Maximum CO concentrations adjacent to streets near the proposed project site, resulting from vehicle emissions, were predicted using the CAL3QHC model Version 2.0.[6] The CAL3QHC model employs a Gaussian (normal distribution) dispersion assumption and includes an algorithm for estimating vehicular queue lengths at signalized intersections. CAL3QHC calculates emissions and dispersion of CO from idling and moving vehicles. The queuing algorithm includes site-specific traffic parameters, such as signal timing and delay (from the 2000 *Highway Capacity Manual* traffic forecasting model), saturation flowrate, vehicle arrival type, and signal actuation (i.e., pre-timed or actuated signal) characteristics to project the number of idling vehicles. The CAL3QHC model has been updated with an extended module, CAL3QCHR, which allows for the incorporation of hourly meteorological data into the modeling, instead of worst-case assumptions regarding meteorological parameters. This refined version of the model, CAL3QHCR, is employed if maximum predicted future CO concentrations are greater than the applicable ambient air quality standards or when *de minimis* thresholds are exceeded using the first level of CAL3QHC modeling.

METEOROLOGY

In general, the transport and concentration of pollutants from vehicular sources are influenced by three principal meteorological factors: wind direction, wind speed, and atmospheric stability. Wind direction influences the direction in which pollutants are dispersed, and atmospheric stability accounts for the effects of vertical mixing in the atmosphere. These factors, therefore, influence the concentration at a particular prediction location (receptor).

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[5] The inspection and maintenance programs require inspections of automobiles and light trucks to determine if pollutant emissions from each vehicle exhaust system are lower than emission standards. Vehicles failing the emissions test must undergo maintenance and pass a repeat test to be registered in New York State.

[6] USEPA. User's Guide to CAL3QHC, A Modeling Methodology for Predicted Pollutant Concentrations Near Roadway Intersections. EPA454R92006.

In applying the CAL3QHC model, the wind angle was varied to determine the wind direction resulting in the maximum concentrations at each receptor. Following the EPA guidelines[7], CAL3QHC computations were performed using a wind speed of 1 meter per second, and the neutral stability class D. The 8-hour average CO concentrations were estimated by multiplying the predicted 1-hour average CO concentrations by a factor of 0.70 to account for persistence of meteorological conditions and fluctuations in traffic volumes. A surface roughness of 3.21 meters was chosen. At each receptor location, concentrations were calculated for all wind directions, and the highest predicted concentration was reported, regardless of frequency of occurrence. These assumptions ensured that worst-case meteorology was used to estimate impacts.

ANALYSIS YEAR

The microscale analyses were performed for 2019, the year by which the proposed project is expected to be completed. The future analysis was performed both without the proposed project (the No Action condition) and with the proposed project (the With Action condition).

BACKGROUND CONCENTRATIONS

Background concentrations are those pollutant concentrations originating from distant sources that are not directly included in the modeling analysis, which directly accounts for vehicular emissions on the streets within 1,000 feet and in the line of sight of the analysis site. Background concentrations are added to modeling results to obtain total pollutant concentrations at an analysis site.

The background concentrations used in the mobile source analysis were based on concentrations recorded at a monitoring station representative of the county or from the nearest available monitoring station and in the statistical form of the NAAQS, as shown in **Table 8-1** and provided in the *CEQR Technical Manual*. CO concentrations were determined using the latest available five years of monitored data (2010–2014). Consistent with the NAAQS, the second-highest value is used. The background concentrations are presented in **Table 8-2**.

Table 8-2
Maximum Background Pollutant Concentrations for Mobile Source Sites

Pollutant	Average Period	Location	Concentration	NAAQS
CO	1-hour	CCNY, Manhattan	2.7 ppm	35 ppm
	8-hour	CCNY, Manhattan	1.7 ppm	9 ppm

Note:
CO is not measured in Staten Island; therefore, the closest monitoring station in New York City was selected.
Source:
New York State Air Quality Report Ambient Air Monitoring System, NYSDEC, 2011–2015.

ANALYSIS SITES

Intersections in the traffic study area were reviewed for microscale analysis based on the *CEQR Technical Manual* guidance. The incremental traffic volumes for the weekday midday, PM, and Saturday midday periods were reviewed and intersections with increments exceeding the CO

[7] *Guidelines for Modeling Carbon Monoxide from Roadway Intersections*, USEPA Office of Air Quality Planning and Standards, Publication EPA-454/R-92-005.

screening thresholds referenced earlier were identified. Of those intersections, the intersection with the largest volume of project-generated traffic was selected for microscale analysis (the one analyzed intersection is shown in **Table 8-3**). The potential impact from vehicle emissions of CO was analyzed.

Table 8-3
Mobile Source Analysis Site

Analysis Site	Location
1	Project Site Entrance and South Avenue

As noted above, the incremental traffic resulting from the proposed project would not exceed the PM emission screening threshold discussed in Chapter 17, Sections 210 and 311 of the *CEQR Technical Manual* at any intersections within the traffic study area (see Chapter 7, "Transportation"). Therefore, a mobile source intersection analysis for the proposed project was not performed for PM.

RECEPTOR PLACEMENT

Multiple receptors (i.e., precise locations at which concentrations are evaluated) were modeled at each of the selected sites; receptors were placed along roadway segments approaching and departing analyzed intersections. This included the internal roadways where vehicles enter and exit the project site as well as adjacent roadway segments. Receptors were placed at a regularly spaced interval of 25 feet within 75 feet of the analyzed intersection and additional receptors at a further 50-foot distance. Ground-level receptors were placed at sidewalk or roadside locations near intersections with continuous public access, at a pedestrian height of 1.8 meters.

PARKING LOT

The proposed project would include 838 parking spaces in a surface lot with entrances on Forest Avenue and South Avenue. Emissions from vehicles using the parking lot could potentially affect ambient levels of pollutants at adjacent receptors. An analysis was performed using the methodology delineated in the *CEQR Technical Manual* to calculate pollutant levels. Since the parking lot would be used by automobiles, the primary pollutants of concern are CO and PM as per the *CEQR Technical Manual*.

Potential impacts from the proposed parking lot on CO and PM concentrations were assessed at multiple receptor locations. The concentrations were determined for the weekday midday, PM, and Saturday midday peak periods, when overall lot usage would be the greatest, considering the hours when the greatest number of vehicles would exit the facility. Emissions from vehicles entering, parking, and exiting the parking facility were estimated using the EPA MOVES mobile source emission model. All arriving and departing vehicles were conservatively assumed to travel at an average speed of 5 miles per hour within the parking facility. In addition, all departing vehicles were assumed to idle for 1 minute before exiting.

A "near" and "far" receptor was placed at the sidewalk along South Avenue at a distance of 3 feet, closest to the parking lot. To determine compliance with the NAAQS, CO concentrations were determined for the maximum 1- and 8-hour average periods, and $PM_{2.5}$ concentrations were determined for the maximum 24-hour and annual average period. A persistence factor of 0.70 was used to convert the calculated 1-hour average maximum concentrations to 8-hour averages, accounting for meteorological variability over the average 8-hour period.

Background concentrations from the nearest NYSDEC monitoring station with available data were added to the modeling results to obtain the total ambient levels. The on-street pollutant concentrations were determined using the methodology in the Air Quality Appendix of the *CEQR Technical Manual*, utilizing traffic volumes derived from the traffic study conducted in the area.

STATIONARY SOURCES

HEATING AND HOT WATER SYSTEMS

A stationary source analysis was conducted to evaluate potential impacts from the proposed project's heating and hot water systems. The combustion equipment was conservatively assumed to use No. 2 fuel oil. The analysis was performed to evaluate potential cumulative impacts from the proposed project's emission sources (project-on-existing), as well as on sensitive uses on-site (project-on-project). The results of this analysis are discussed in section G, "the Future with the Proposed Project."

Initial Screening

An initial screening analysis was performed using the methodology described in Section 322.1 of Chapter 17 of the *CEQR Technical Manual*. This methodology determines the threshold of development size below which the proposed project would not have a significant adverse impact. The screening procedure utilizes information regarding the fuel to be used, the maximum development size, type of development, and the exhaust stack height, to evaluate whether or not there is a potential for a significant adverse impact.

Based on the distance from the proposed project to the nearest building of similar or greater height (within an initial study area screening distance of 400 feet), if the maximum development size is greater than the threshold size in the *CEQR Technical Manual*, then there is the potential for significant adverse air quality impacts, and a refined dispersion modeling analysis would be required. Otherwise, the source passes the screening analysis.

AERSCREEN Analysis

Potential 1-hour average NO_2, 1-hour average SO_2 and 24-hour and annual average $PM_{2.5}$ impacts from the proposed project's heating and hot water systems' emissions were evaluated using the USEPA's AERSCREEN model (version 15181 USEPA, 2015). The AERSCREEN model predicts worst-case 1-hour average concentrations downwind from a point, area, or volume source. AERSCREEN generates application-specific worst-case meteorology using representative minimum and maximum ambient air temperatures, and site-specific surface characteristics such as albedo, Bowen ratio, and surface roughness length.[8] The AERSCREEN model was used to calculate worst-case ambient concentrations of criteria pollutants from the proposed project downwind of the stack.

The model incorporates the Plume Rise Model Enhancements (PRIME) downwash algorithm, which is designed to predict impacts in the "cavity region" (i.e., the area around a structure

[8] The albedo is the fraction of the total incident solar radiation reflected by the ground surface. The Bowen ratio is the ratio of the sensible heat flux to the latent (evaporative) heat flux. The surface roughness length is related to the height of obstacles to the wind flow and represents the height at which the mean horizontal wind speed is zero based on a logarithmic profile.

which under certain conditions may affect an exhaust plume, causing a portion of the plume to become entrained in a recirculation region). AERSCREEN utilizes the PRIME plume rise model enhancements to the Building Profile Input Program (BPIPPRM) to provide a detailed analysis of downwash influences on a direction-specific basis. AERSCREEN also incorporates complex terrain algorithms and utilizes a terrain processor to account for the actual terrain in the vicinity of the source on a direction-specific basis.

The AERSCREEN model was run both with and without the influence of building downwash, using urban diffusion coefficients that were based on a review of land-use maps of the area. Other model options were selected based on USEPA guidance.

NO_x is emitted mostly as NO and transformed to NO_2 as part of the chemical reactions in the atmosphere. Maximum 1-hour average NO_2 concentrations were estimated from modeled NO_x concentrations using an NO_2 to NO_x ratio of 0.8. The 0.8 ratio used for the maximum 1-hour concentration is the recommended default ratio per USEPA's guidance memo providing additional clarification regarding application of *Appendix W Modeling Guidance* for the 1-hour average NO_2 modeling.[9]

Emission Estimates and Stack Parameters

The stack exhaust parameters and emission rates used in the AERSCREEN analysis are presented in **Table 8-4**. Annual emissions rates for heating and hot water systems were calculated based on fuel consumption estimates, using energy use estimates based on type of development and size of the development as recommended in the *CEQR Technical Manual*, and applying the USEPA's *Compilations of Air Pollutant Emission Factors (AP-42)* emission factors for No. 2 fuel oil-fired boilers.[10] The short-term emission rates were calculated by scaling the annual emissions to account for a 100-day heating season. For each analysis, the exhaust from the heating and hot water systems were assumed to be vented through a single stack located three feet above the bulkhead roof of the source building at a height of approximately 38 feet above grade. For the purposes of this analysis, the following scenarios were analyzed: the cumulative impact of the proposed project on off-site receptors, the cumulative impact of the Retail C, D, E on Retail A, the impact of Retail A on Retail B, and the impact of Retail B on Retail A (see Figure 1-4 in Chapter 1, "Project Description," for the proposed site plan).

Table 8-4
Heating and Hot Water System Stack Parameters and Emission Rates

Stack Parameter	Proposed Project	Retail C, D, E	Retail A	Retail B
Stack Height (feet)	38	38	38	38
Stack Diameter (feet)	1	1	1	1
Exhaust Velocity (meters per second)	9.600	8.2	0.600	0.700
Exhaust Temperature (degrees Fahrenheit)	300	300	300	300
Emission Rate (grams/second)				
NO_x (1-hour average)	0.100	0.080	0.006	0.007
SO_2 (1-hour average)	0.001	0.001	0.00007	0.00008
$PM_{2.5}$ (24-hour average)	0.010	0.010	0.0007	0.0008
$PM_{2.5}$ (Annual average)	0.003	0.003	0.0002	0.0002

[9] USEPA. Memorandum: Clarification on the use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 National Ambient Air Quality Standard. September 30, 2014.

[10] USEPA. *Compilations of Air Pollutant Emission Factors AP-42*. Fifth Edition, Volume I, Chapter 1, Section 3. http://www.epa.gov/ttn/chief/ap42. September, 1998

Receptor Placement

Receptors (locations in the model at which concentrations are projected) are generally placed at windows in residential or other sensitive buildings, air intakes, and publically accessible open space locations, as applicable. The nearest building of similar or greater height was determined to be a community facility use at 2314 Forest Avenue, approximately 350 feet from the closest project building (Retail C). Therefore, concentrations were analyzed at this receptor distance for the AERSCREEN analysis. Receptors representing sensitive uses within the project site were also modeled to ensure that pollutant concentrations at these locations do not exceed the air quality impact criteria. Discrete receptors (i.e., locations at which concentrations are calculated) were modeled at multiple heights along the façade of the buildings to represent operable window locations (at off-site locations) and potential intake vents.

Background Concentrations

To estimate the maximum expected total NO_2 and SO_2 concentrations at a given receptor, the maximum predicted modeled concentration was added to the corresponding background concentration (see **Table 8-5**). This background level represents the 98th and 99th percentile annually of the daily highest 1-hour average NO_2 and SO_2 concentrations, respectively (these are the statistical form of the respective standards) that was monitored at the nearest NYSDEC background monitoring station. It was conservatively assumed that the maximum background concentration occurs on all days. The background concentration for annual average $PM_{2.5}$ is not used since the criterion is based on incremental concentrations only. However, the *de minimis* criteria take into account background concentrations for the 24-hour $PM_{2.5}$ standard.

Table 8-5
Maximum Background Pollutant Concentrations for Heating and Hot Water System Analysis

Pollutant	Average Period	Location	Background Concentration (µg/m³)	Standard (µg/m³)
NO_2	1-hour	IS 52, Bronx	121	188(1)
SO_2	1-hour	IS 52, Bronx	36.9	196(1)
$PM_{2.5}$	24-hour	Port Richmond, Staten Island	20.3	7.4(2)
$PM_{2.5}$	Annual	N/A	N/A	0.3(3)

Notes:
N/A—Not Applicable
[1] 1-hour average NAAQS.
[2] $PM_{2.5}$ *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m³.
[3] $PM_{2.5}$ *de minimis* criteria—annual (discrete receptor), 0.3 µg/m³

INDUSTRIAL SOURCES

The proposed project is located within an area zoned for manufacturing uses, therefore, industrial air pollutant emission sources within 400 feet of the project site were considered for inclusion in the air quality impact analysis, as recommended in the *CEQR Technical Manual*. Land use maps were reviewed to identify potential sources of emissions from manufacturing and/or industrial operations. Next, a field survey was conducted to identify uses within 400 feet of the project site that have the potential for emitting air pollutants of concern. The survey was conducted on October 18, 2016. A request was made to New York City Department of Environmental Protection's (DEP) Bureau of Environmental Compliance (BEC) to obtain all the available certificates of operation for the identified industrial sources and to determine whether

manufacturing or industrial emissions occur. In addition, a search of federal and state-permitted facilities within the study area was conducted using the EPA's Envirofacts database.[11]

After compiling the information on this facility, maximum potential pollutant concentrations from identified sources were estimated based on the reference values found in Table 17-3 in the *CEQR Technical Manual*. The table consists of a screening database that provides factors for estimating maximum concentrations based on distance from the source, which were derived from generic AERMOD dispersion modeling for the New York City area. The minimum distance between the property boundary of the project site and the facility was used. Predicted worst-case impacts on the proposed project were compared with the short-term guideline concentrations (SGCs) and annual guideline concentrations (AGCs) recommended in NYSDEC's *DAR-1 AGS/SGC Tables*.[12] These guideline concentrations present the airborne concentrations, which are applied as a screening threshold to determine whether future occupants in the proposed project could be significantly impacted from nearby sources of air pollution.

The results of the industrial source analysis are discussed in section G, "The Future with the Proposed Project."

E. EXISTING CONDITIONS

Monitored background concentrations of SO_2, NO_2, CO, ozone, lead, PM_{10}, and $PM_{2.5}$ for the study area are shown in **Table 8-6**. These values are the most recent monitored data that have been made available by NYSDEC. All data statistical forms and averaging periods are consistent with the definitions of the NAAQS. It should be noted that these values are somewhat different than the background concentrations presented in **Table 8-6**.

Table 8-6
Representative Monitored Ambient Air Quality Data

Pollutant	Location	Units	Averaging Period	Concentration	NAAQS
CO	CCNY, Manhattan	ppm	8-hour	1.5	9
			1-hour	2.3	35
SO_2	IS 52, Bronx	µg/m^3	3-hour	28	1,300
			1-hour	36.9	196
PM_{10}	Division Street, Manhattan	µg/m^3	24-hour	44	150
$PM_{2.5}$	Port Richmond, Staten Island	µg/m^3	Annual	8.3	12
			24-hour	20.3	35
NO_2	IS 52, Bronx	µg/m^3	Annual	39.1	100
			1-hour	121	188
Lead	IS 52, Bronx	µg/m^3	3-month	0.0061	0.150
Ozone	IS 52, Bronx	ppm	8-hour	0.068	0.075

Notes:
Based on the NAAQS definitions, the CO and 3-hour SO_2 concentrations for short-term averages are the second-highest from the year.
$PM_{2.5}$ annual concentrations are the average of 2013, 2014, and 2015, and the 24-hour concentration is the average of the annual 98th percentiles in 2013, 2014, and 2015.
8-hour average ozone concentrations are the average of the 4th highest-daily values from 2013 to 2015. SO_2 1-hour and NO_2 1-hour concentrations are the average of the 99th percentile and 98th percentile, respectively, of the highest daily 1-hour maximum from 2013 to 2015.
Source:
NYSDEC, New York State Ambient Air Quality Data, 2016.

[11] http://oaspub.epa.gov/enviro/ef_home2.air

[12] NYSDEC Division of Air Resources, Bureau of Stationary Sources, April 2016.

As shown in **Table 8-6**, there were no monitored violations of NAAQS at these monitoring sites in 2015.

F. THE FUTURE WITHOUT THE PROPOSED PROJECT

MOBILE SOURCES

CO concentrations in the No Action condition were determined for future 2019 conditions using the methodology previously described. **Table 8-7** shows the future maximum predicted 8-hour average CO concentration, including background concentration, at the analysis intersection in the No Action condition. The value shown is the highest predicted concentration for the receptor locations for any of the time periods analyzed.

Table 8-7
Maximum Predicted Future (2019) 8-Hour
Average Carbon Monoxide No Action Concentrations

Receptor Site	Location	Time Period	8-Hour Concentration (ppm)
1	Project Site Entrance and South Avenue	Saturday MD	2.1

Notes:
8-hour standard (NAAQS) is 9 ppm.
Concentration includes a background concentration of 1.7 ppm.

As shown in **Table 8-7**, 2019 No Action values are predicted to be well below the 8-hour CO standard of 9 ppm.

As noted above, the incremental traffic resulting from the proposed project would not exceed the PM emission screening threshold discussed in Chapter 17, Sections 210 and 311 of the *CEQR Technical Manual* at any intersections within the traffic study area (see Chapter 7, "Transportation"). Therefore, a mobile source intersection analysis for the proposed project was not performed for PM.

G. THE FUTURE WITH THE PROPOSED PROJECT

MOBILE SOURCES

CO concentrations for future conditions in the 2019 analysis year were predicted using the methodology previously described. **Table 8-8** shows the future maximum predicted 8-hour average CO concentrations at the intersection studied. (No 1-hour values are shown, since no exceedances of the NAAQS would occur and the *de minimis* criteria are only applicable to 8-hour concentrations; therefore, the 8-hour values are the most critical for impact assessment.) The values shown are the highest predicted concentrations. The results indicate that the proposed project would not result in any violations of the 8-hour CO standard. In addition, the incremental increases in 8-hour average CO concentrations are very small, and consequently would not result in a violation of the CEQR *de minimis* CO criteria. Therefore, mobile source CO emissions resulting from the proposed project would not result in a significant adverse impact on air quality.

Table 8-8
Maximum Predicted Future (2019) 8-Hour Average Carbon Monoxide With Action Concentrations

Analysis Site	Location	Time Period	No Build	Build	*De Minimis*
1	Project Site Entrance and South Avenue	Saturday MD	2.1	2.2	5.5
Notes: 8-hour standard is 9 ppm. Concentration includes a background concentration of 1.7 ppm.					

As noted above, the incremental traffic resulting from the proposed project would not exceed the PM emission screening threshold discussed in Chapter 17, Sections 210 and 311 of the *CEQR Technical Manual* at any intersections within the traffic study area (see Chapter 7, "Transportation"). Therefore, a mobile source intersection analysis for the proposed project was not performed for PM.

PARKING LOT

Based on the methodology previously described, the maximum predicted CO and PM concentrations from the proposed parking facility were analyzed, assuming a near side sidewalk receptor on the same side of the street (3 feet) as the parking facility and a far side sidewalk receptor on the opposite side of the street (96 feet) from the parking facility.

The maximum predicted 8-hour average CO concentration of all the receptors modeled is 2.3 ppm. This value includes a predicted concentration of 0.09 ppm from emissions within the parking lot, on-street contribution of 0.21 ppm, and a background level of 1.7 ppm. The maximum predicted concentration is substantially below the applicable standard of 9 ppm and the *de minimis* CO criteria.

The maximum predicted 24-hour and annual average $PM_{2.5}$ increments are 1.57 $\mu g/m^3$ and 0.03 $\mu g/m^3$, respectively. The maximum predicted $PM_{2.5}$ increments are well below the respective $PM_{2.5}$ *de minimis* criteria of 7.35 $\mu g/m^3$ for the 24-hour average concentration and 0.1 $\mu g/m^3$ for the annual concentration. Therefore, the proposed project's parking lot would not result in any significant adverse air quality impacts.

STATIONARY SOURCES

INITIAL SCREENING

Based on the results of the screening analysis, the distance below which impacts might occur on off-site buildings of similar height from the cumulative emission sources from the proposed project was estimated to be 113 feet. As noted above, the distance to the nearest building of similar height is approximately 350 feet. The proposed project is below the maximum development size shown in Figures 17-6 and 17-7 of the *CEQR Technical Manual* Air Quality Appendix for No. 2 oil and natural gas, respectively; therefore the proposed project passes the screening analysis for NO_2 annual impacts (see **Figure 8-1**). Since annual average NO_2 is the critical pollutant in this particular analysis, impacts would also not be expected for other pollutants, specifically SO_2, PM_{10}, and CO.

AERSCREEN ANALYSIS

An analysis was performed using AERSCREEN model to evaluate potential impacts of $PM_{2.5}$, 1-hour NO_2, and 1-hour SO_2 from operation of heating and hot water systems at the project site. The results of the screening analysis of the proposed project's heating and hot water systems at the off-site building receptors, the shared building for Retail C, D, E on any project building (maximum concentrations were used to assess the potential for one of these three impacting the façades of the others), Retail A on Retail B, and Retail B on Retail A, are presented in **Tables 8-9 through 8-12**, respectively. The maximum predicted 1-hour average NO_2 and SO_2 concentrations were added to the maximum ambient background concentration and compared with the NAAQS, while 24-hour and annual average $PM_{2.5}$ concentrations were compared with the $PM_{2.5}$ *de minimis* criteria. As shown in **Tables 8-9 through 8-12**, the maximum modeled concentrations for all pollutants are less than the applicable standards and would therefore not result in a significant impact on air quality.

Table 8-9
Maximum Modeled Pollutant Concentrations (µg/m³)
for Off-Site Building Receptors

Pollutant	Averaging Period	Maximum Modeled Impact	Background	Total Concentration	Criterion
NO_2	1-hour	34.90[(1)]	121	156	188[(2)]
SO_2	1-hour	0.50	36.90	37.40	196[(2)]
$PM_{2.5}$	24-hour	3.10	N/A	3.10	7.40[(3)]
$PM_{2.5}$	Annual	0.14	N/A	0.14	0.30[(4)]

Notes:
N/A—Not Applicable.
(1) The 1-hour NO_2 concentration is estimated using NO_2 to NO_x ratio of 0.8 as per USEPA guidance.
(2) 1-hour average NAAQS.
(3) $PM_{2.5}$ *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m³.
(4) $PM_{2.5}$ *de minimis* criteria—annual (discrete receptor), 0.3 µg/m³.

Table 8-10
Maximum Modeled Pollutant Concentrations (µg/m³)
for Retail C, D, E

Pollutant	Averaging Period	Maximum Modeled Impact	Background	Total Concentration	Criterion
NO_2	1-hour	49.80[(1)]	121	170.80	188[(2)]
SO_2	1-hour	0.70	36.90	37.60	196[(2)]
$PM_{2.5}$	24-hour	4.40	N/A	4.40	7.40[(3)]
$PM_{2.5}$	Annual	0.20	N/A	0.20	0.30[(4)]

Notes:
N/A—Not Applicable.
(1) The 1-hour NO_2 concentration is estimated using NO_2 to NO_x ratio of 0.8 as per USEPA guidance.
(2) 1-hour average NAAQS.
(3) $PM_{2.5}$ *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m³.
(4) $PM_{2.5}$ *de minimis* criteria—annual (discrete receptor), 0.3 µg/m³.

Table 8-11
Maximum Modeled Pollutant Concentrations (µg/m^3) for Retail A on Retail B

Pollutant	Averaging Period	Maximum Modeled Impact	Background	Total Concentration	Criterion
NO_2	1-hour	12.30[(1)]	121	133.30	188[(2)]
SO_2	1-hour	0.20	36.90	37.10	196[(2)]
$PM_{2.5}$	24-hour	1.10	N/A	1.10	7.40[(3)]
$PM_{2.5}$	Annual	0.05	N/A	0.05	0.30[(4)]

Notes:
N/A—Not Applicable.
(1) The 1-hour NO_2 concentration is estimated using NO_2 to NO_x ratio of 0.8 as per USEPA guidance.
(2) 1-hour average NAAQS.
(3) $PM_{2.5}$ *de minimis* criteria — 24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m^3.
(4) $PM_{2.5}$ *de minimis* criteria—annual (discrete receptor), 0.3 µg/m^3.

Table 8-12
Maximum Modeled Pollutant Concentrations (µg/m^3)for Retail B on Retail A

Pollutant	Averaging Period	Maximum Modeled Impact	Background	Total Concentration	Criterion
NO_2	1-hour	13[(1)]	121	134	188[(2)]
SO_2	1-hour	0.20	36.90	37.10	196[(2)]
$PM_{2.5}$	24-hour	1.20	N/A	1.20	7.40[(3)]
$PM_{2.5}$	Annual	0.05	N/A	0.05	0.30[(4)]

Notes:
N/A—Not Applicable.
(1) The 1-hour NO_2 concentration is estimated using NO_2 to NO_x ratio of 0.8 as per USEPA guidance.
(2) 1-hour average NAAQS.
(3) $PM_{2.5}$ *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m^3.
(4) $PM_{2.5}$ *de minimis* criteria—annual (discrete receptor), 0.3 µg/m^3.

Overall, based on the *CEQR Technical Manual* screening analysis and the AERSCREEN analyses, there would be no potential significant adverse stationary source air quality impacts from the proposed project's heating and hot water systems.

INDUSTRIAL SOURCE ANALYSIS

As discussed, a study was conducted to identify manufacturing and industrial uses within the 400-foot study area. DEP-BEC, NYSDEC, and EPA permit databases were used to identify existing sources of industrial emissions. One permitted facility, an auto body shop located at 2391 Forest Avenue, was identified within 400 feet of the project site.

The screening procedure used to estimate pollutant concentrations from this facility's emissions is based on information obtained from DEP-BEC. The information describes contaminants emitted by the permitted processes, hours of operation per day, and days per year, and the characteristics of the emission exhaust systems (temperature, exhaust velocity, height, and dimensions of the exhaust).

Table 8-13 presents the maximum modeled short-term and long-term impacts from the facility on the proposed project. The table also lists the SGC and AGC for each toxic air pollutant.

Table 8-13
Maximum Modeled Pollutant Concentrations (µg/m^3)

Pollutant	CAS No.	Short-term impact (µg/m^3)	SGC (µg/m^3)(1)	Annual impact (µg/m^3)	AGC (µg/m^3)(1)
Solids	NY079-00-0	25	380	0.17	45
Solvents	NY998-00-0	1,776	98,000	11.70	7,000

Notes:
[1] *DAR-1 AGS/SGC Tables,* DEC Division of Air Resources, Bureau of Stationary Sources, April 2016.

The results of the industrial source analysis demonstrate that there would be no predicted significant adverse air quality impacts on the proposed project from the existing facility identified in the industrial source study area. ✷