A. INTRODUCTION

This chapter examines the potential for air quality impacts from the proposed project. As described in Chapter 1, "Project Description," the proposed Farley Post Office/Moynihan Station Redevelopment Project (Farley/Moynihan) is expected to be constructed in up to two possible development phases. It would include the redevelopment of the existing Farley Complex (Phase I) and the utilization of an additional 1 million zoning square feet of unused developed rights in Phase II for development of either a new commercial overbuild on the Western Annex (under Scenario 1) or a primarily residential or mixed-use building on the Development Transfer Site (under Scenario 2).

Air quality impacts can be either direct or indirect. Direct impacts stem from emissions generated by stationary sources at the project site, such as emissions from fuel burned on site for heating, ventilation, and air conditioning (HVAC) systems. However, for the proposed project direct effects would be insignificant since the proposed Phase I and Phase II development programs would use steam from Con Edison for heating purposes.

Indirect impacts are caused by potential emissions from nearby existing stationary sources and the potential for emissions due to mobile sources/vehicles generated by the proposed project. A mobile source analysis was conducted to evaluate potential impacts from carbon monoxide (CO) and particulate matter (PM) emissions due to the proposed project.

In addition, since the proposed project would include hotel uses in Phase I and residential uses in Phase II under Scenario 2, the potential effects of stationary source emissions from existing nearby industrial facilities on the proposed project were assessed.

Since the project involves both New York City and New York State agency approvals and/or funding, this analysis used the air quality analysis procedures suggested in *CEQR Technical Manual* and the New York State Department of Transportation's (NYSDOT) *Environmental Procedures Manual* (*EPM*) in the development of the methodology and assessment of impacts.

PRINCIPAL CONCLUSIONS

The results of this analysis show that the maximum predicted CO and PM_{10} concentrations from mobile sources with the proposed project would be below the corresponding ambient air standards. Furthermore, CO concentrations would not exceed the City's *de minimis* criteria, and $PM_{2.5}$ concentrations would not exceed the interim guidance criteria regarding $PM_{2.5}$ impacts. The regional analysis shows that the proposed project would result in an overall decrease in total emissions for VOCs, NO_x, CO, PM_{10} and $PM_{2.5}$ (defined below). Thus, the proposed project would not have significant adverse impacts from mobile source or regional emissions, and would be consistent with the New York State Implementation Plan for the control of ozone and CO. In addition, a screening analysis demonstrated that there would be no significant adverse air quality impacts from industrial facilities on the proposed project.

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. Typically, ambient concentrations of CO are predominantly influenced by mobile source emissions. Volatile organic compounds (VOCs) and nitrogen oxides (NO and NO_2, collectively referred to as NO_x) are emitted from both mobile and stationary sources. Emissions of sulfur dioxide (SO_2) are associated mainly with stationary sources and sources utilizing non-road diesel such as diesel trains, marine engines and non-road vehicles such as construction engines; but diesel-powered vehicles, primarily heavy duty trucks and buses, also currently contribute somewhat to these emissions. Diesel fuel regulations that will begin to take effect in 2006 will reduce SO_2 emissions from mobile sources to extremely low levels. PM is emitted from both stationary and mobile sources. Fine particulate matter is also formed when emissions of NO_x, sulfur oxides (SO_x), ammonia, organic compounds, and other gases react or condense in the atmosphere. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs, emitted mainly from industrial processes and mobile sources.

CARBON MONOXIDE

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. Since CO is a reactive gas which does not persist in the atmosphere, CO concentrations can vary greatly 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 predicted on a local, or microscale, basis.

The proposed project would result in changes in traffic patterns and an increase in traffic volume in the study area and could potentially result in local increases in CO concentrations. Therefore, a mobile source analysis was conducted at critical intersections in the study area to evaluate future CO concentrations with and without the proposed project.

The proposed project would potentially result in changes to the regional vehicular travel patterns in the study areas. Therefore, the change in regional CO emissions was analyzed.

NITROGEN OXIDES, VOCS, AND OZONE

Nitrogen Oxides (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 change in regional mobile source emissions of these pollutants would be related to the total vehicle miles traveled added or subtracted on various roadway types throughout the New York and New Jersey metropolitan area, which is designated as a severe non-attainment area for ozone by the United States Environmental Protection Agency (USEPA).

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, there is a standard for average annual nitrogen dioxide (NO_2) concentrations, which is normally examined only for fossil fuel energy sources. The proposed project would not involve the addition of any new stationary emission sources, since both the Phase I and Phase II developments would use steam from Con Edison for heating purposes. Therefore, an analysis of potential increases in NO_2 emissions was not warranted.

The proposed project would potentially result in changes to the regional vehicular travel patterns in the study areas. Therefore, the change in regional NO_x and VOC emissions was analyzed.

LEAD

Lead emissions in air are principally associated with industrial sources and motor vehicles that use gasoline containing lead additives. Most U.S. vehicles produced since 1975, and all produced after 1980, are designed to use unleaded fuel. As these newer vehicles have replaced the older ones, motor vehicle-related lead emissions have decreased. As a result, ambient concentrations of lead have declined significantly. Nationally, the average measured atmospheric lead level in 1985 was only about one-quarter the level in 1975.

In 1985, USEPA announced new rules that drastically reduced the amount of lead permitted in leaded gasoline. The maximum allowable lead level in leaded gasoline was reduced from the previous limit of 1.1 to 0.5 grams per gallon effective July 1, 1985, and to 0.1 grams per gallon effective January 1, 1986. Monitoring results indicate that this action has been effective in significantly reducing atmospheric lead concentrations. Effective January 1, 1996, the Clean Air Act banned the sale of the small amount of leaded fuel that was still available in some parts of the country for use in on-road vehicles, concluding the 25-year effort to phase out lead in gasoline. Even at locations in the New York City area where traffic volumes are very high, atmospheric lead concentrations are far below the national standard of 1.5 micrograms per cubic meter (three-month average).

No significant sources of lead are associated with the proposed project, and, therefore, analysis was not warranted.

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

Respirable Particulate Matter (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 volatile organic compounds—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 woodburning stoves and fireplaces. Particulate matter also acts as a substrate for the adsorption 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 (or $PM_{2.5}$), and particles with an aerodynamic diameter of less than or equal to 10 micrometers (or 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 are adsorbed 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 particulate matter (often soon after the release from an exhaust pipe or stack) or from precursor gases reacting in the atmosphere to form secondary PM.

Diesel-powered vehicles, especially heavy duty trucks and buses, are a significant source of respirable PM, most of which is $PM_{2.5}$; PM concentrations may, consequently, be locally elevated near roadways with high volumes of heavy diesel-powered vehicles. The proposed project would increase the number of diesel powered vehicles and could potentially result in local increases of respirable PM concentrations. Therefore, an analysis of potential impacts from PM_{10} and $PM_{2.5}$ was conducted at a critical intersection in the study area.

The proposed project would potentially result in changes to the regional vehicular travel patterns in the study areas. Therefore, the change in regional PM_{10} and $PM_{2.5}$ emissions was analyzed.

SULFUR DIOXIDE

Sulfur Dioxide (SO_2) emissions are primarily associated with the combustion of sulfur-containing fuels: oil and coal.

Due to the federal restrictions on the sulfur content in diesel fuel for on-road vehicles, no significant quantities are emitted from vehicular sources. Monitored SO_2 concentrations in New York City are below the national standards. Vehicular sources of SO_2 are not significant and, therefore, an analysis of this pollutant from mobile sources was not warranted.

The proposed project would not involve the addition of any new stationary emission sources, since both the Phase I and Phase II developments would use steam from Con Edison for heating purposes. Therefore, an analysis of potential increases in SO_2 emissions was not warranted.

C. AIR QUALITY REGULATIONS, STANDARDS, AND BENCHMARKS

NATIONAL AND STATE AIR QUALITY STANDARDS

As required by the Clean Air Act (CAA), as amended in 1990, primary and secondary National Ambient Air Quality Standards (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 and secondary standards are the same for NO_2, ozone, lead, and PM, and there is no secondary standard for CO. EPA promulgated additional NAAQS which became effective September 16, 1997: a new 8-hour standard for ozone, which replaced the previous 1-hour standard, and new 24-hour and annual standards for $PM_{2.5}$ adopted in addition to the PM_{10}

standards. The standards are presented in Table 15-1. These standards have also been adopted as the ambient air quality standards for New York State and New Jersey.

On December 20, 2005, EPA proposed revisions to the NAAQS for PM. The proposed NAAQS include lowering the level of the 24-hour $PM_{2.5}$ standard from the current level of 65 micrograms per cubic meter ($\mu g/m^3$) to 35 $\mu g/m^3$, retaining the level of the annual fine standard at 15 $\mu g/m^3$, and setting a new 24-hour standard for inhalable coarse particles, which includes particles larger than 2.5 micrometers and smaller than 10 micrometers ($PM_{10-2.5}$), at 70 $\mu g/m^3$. EPA is not proposing an annual standard for $PM_{10-2.5}$. EPA is proposing to revoke the current 24-hour PM_{10} standards as soon as $PM_{10-2.5}$ determinations are made (see "NAAQS Attainment Status and State Implementation Plans," below), except in areas with a population of 100,000 or more that have violating monitors (such as Manhattan), and to revoke the annual PM_{10} standard immediately. EPA is also soliciting public comment on a 24-hour $PM_{2.5}$ standard as low as 30 $\mu g/m^3$ and an annual standard as low as 13 $\mu g/m^3$, and will take comment on leaving the 24-hour $PM_{2.5}$ standard at its current level (65 $\mu g/m^3$) or setting it at levels ranging from 25 to 65 $\mu g/m^3$ or other alternative approaches to the 24-hour standard, and on setting the annual standard as low as 12 $\mu g/m^3$. EPA is also considering a secondary standard designed to address visibility in urban areas, within a range of 20 to 30 $\mu g/m^3$, and on averaging times for the standard within a range of four to eight daylight hours. EPA proposes to finalize the new standards by September 2006.

STATE IMPLEMENTATION PLAN (SIP)

The CAA 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 is a state's plan on how it will meet the NAAQS under the deadlines established by the CAA.

USEPA has recently re-designated New York City as in attainment for CO. The CAA requires that a maintenance plan ensure continued compliance with the CO NAAQS for former non-attainment areas. New York City is also 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.

Manhattan has been designated as a moderate NAA for PM_{10}. On December 17, 2004, EPA took final action designating the five boroughs of New York City, Nassau, Suffolk, Rockland, Westchester and Orange Counties as $PM_{2.5}$ non-attainment areas under the CAA. State and local governments are required to develop SIPs by early 2008, which will be designed to meet the standards by 2010. As described above, EPA has proposed revisions for the PM standards. If the revisions are finalized in September 2006, $PM_{2.5}$ attainment designations would be effective by April 2010, $PM_{2.5}$ SIPs would be due by April 2013, and would be designed to meet the $PM_{2.5}$ standards by April 2015 (may be extended in some cases up to April 2020). The new $PM_{10-2.5}$ designations would be finalized in July 2013 (by which time three years of data would be available), $PM_{10-2.5}$ SIPs would be due by July 2016, and would be designed to meet the $PM_{2.5}$ standards by July 2018 (may be extended in some cases up to July 2023).

Nassau, Rockland, Suffolk, Westchester and the five counties of New York City had been designated as severe non-attainment areas for ozone 1-hour standard. In November 1998, New York State submitted its *Phase II Alternative Attainment Demonstration for Ozone*, which was finalized and approved by EPA effective March 6, 2002, addressing attainment of the 1-hour

Table 15-1
Ambient Air Quality Standards

Pollutant	Primary		Secondary	
	ppm	µg/m³	ppm	µg/m³
Carbon Monoxide (CO)				
Maximum 8-Hour Concentration[(1)]	9	10,000	None	
Maximum 1-Hour Concentration[(1)]	35	40,000		
Lead				
Maximum Arithmetic Mean Averaged Over 3 Consecutive Months	NA	1.5	NA	1.5
Nitrogen Dioxide (NO_2)				
Annual Arithmetic Average	0.053	100	0.053	100
Ozone (O_3)				
1-Hour Average — revoked June 15, 2005	0.12	235	0.12	235
8-Hour Average[(2)]	0.08	157	0.08	157
Total Suspended Particles (TSP)				
Annual Mean Rural Open Space Rural Residential Urban Residential Urban Industrial	NA	 45 55 65 75	None	
Maximum 24-Hour Concentration	NA	250		
Respirable Particulate Matter (PM_{10})				
Average of 3 Annual Arithmetic Means	NA	50	NA	50
24-Hour Concentration[(1)]	NA	150	NA	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Average of 3 Annual Arithmetic Means	NA	15	NA	15
24-Hour Concentration[(3)]	NA	65	NA	65
Sulfur Dioxide (SO_2)				
Annual Arithmetic Mean	0.03	80	NA	NA
Maximum 24-Hour Concentration[(1)]	0.14	365	NA	NA
Maximum 3-Hour Concentration[(1)]	NA	NA	0.50	1,300

Notes: ppm - parts per million
µg/m³ - micrograms per cubic meter
NA - not applicable

PM concentrations are in µg/m³. Concentrations of all gaseous pollutants are defined in ppm — approximately equivalent concentrations in µg/m³ are presented.

TSP levels are regulated by a New York State Standard only. All other standards are NAAQS.

(1) Not to be exceeded more than once a year.
(2) 3-year average of the annual fourth highest daily maximum 8-hr average concentration.
(3) Not to be exceeded by the 98th percentile averaged over 3 years.

Sources: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards; 6 NYCRR Part 257: Air Quality Standards.

ozone NAAQS by 2007. New York State has recently submitted revisions to the SIP; these SIP revisions include additional emission reductions that EPA requested to demonstrate attainment of the standard, and an update of the SIP estimates using two new EPA models—the mobile source emissions model MOBILE6, and the non-road emissions model NONROAD—which have been updated to reflect current knowledge of engine emissions and the latest mobile and non-road engine emission regulations. On April 15, 2004, EPA designated these same counties as moderate non-attainment for the new 8-hour ozone standard that became effective as of June 15, 2004 (all of Orange County was moved to the Poughkeepsie moderate non-attainment area for 8-hour ozone). EPA revoked the 1-hour standard on June 15, 2005; however, the specific control measures for the 1-hour standard included in the SIP are required to stay in place until the 8-hour standard is attained. The discretionary emissions reductions in the SIP would also remain but could be revised or dropped based on modeling. A new SIP for ozone will be adopted by the state no later than June 15, 2007, with a target attainment deadline of June 15, 2010.

DETERMINING THE SIGNIFICANCE 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 15-1) would be deemed to have a potential significant adverse impact. In addition, in order 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.

DE MINIMIS CRITERIA REGARDING CO IMPACTS

New York City has developed *de minimis* criteria to assess the significance of the incremental increase in CO concentrations that would result from proposed projects or actions, 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 8-hour concentration in the Future Without the Proposed Action (the No Build condition) is equal to or between 8 and 9 ppm; or (2) an increase of more than half the difference between baseline (i.e., No Build) concentrations and the 8-hour standard, when No Build concentrations are below 8.0 ppm.

INTERIM GUIDANCE CRITERIA REGARDING $PM_{2.5}$ IMPACTS

The New York State Department of Environmental Conservation (NYSDEC) has published a policy to provide interim direction for evaluating $PM_{2.5}$ impacts. This policy would apply only to facilities applying for permits or major permit modifications under the State Environmental Quality Review Act (SEQRA) that emit 15 tons of PM_{10} or more annually. The interim guidance policy states that such a project will be deemed to have a potentially significant adverse impact if the project's maximum predicted impacts would increase $PM_{2.5}$ concentrations by more than 0.3 $\mu g/m^3$ averaged annually or more than 5 $\mu g/m^3$ on a 24–hour basis. Projects that exceed either the annual or 24–hour threshold will be required to prepare an Environmental Impact Statement (EIS) to assess the severity of the impacts, to evaluate alternatives, and to employ reasonable and necessary mitigation measures to minimize the $PM_{2.5}$ impacts of the source to the maximum extent practicable.

The New York City Department of Environmental Protection (NYCDEP) is currently employing an interim guidance criterion for evaluating the potential $PM_{2.5}$ impacts from NYCDEP projects under New York City Environmental Quality Review (CEQR). The interim guidance criterion for determining the potential for significant adverse impacts from $PM_{2.5}$ is as follows:

- Predicted incremental ground-level concentrations of $PM_{2.5}$ greater than 0.1 $\mu g/m^3$ on an annual average neighborhood-scale basis (i.e., the computed annual concentration averaged over receptors placed over a one kilometer by one kilometer grid, centered on the location where the maximum impact is predicted from stationary sources, or at a distance of at least 15 meters from an arterial roadway in the case of mobile sources).

Actions that would increase $PM_{2.5}$ concentrations by more than the interim guidance criterion above would be considered to have the potential to result in significant adverse impacts, depending upon the probability of occurrence, the projected duration of such impacts, the magnitude of the area and the potential number of people affected. NYCDEP recommends that actions subject to CEQR, which would potentially cause an exceedance of these criteria, prepare an EIS and examine potential measures to reduce or eliminate such impacts.

For the proposed project, the above NYSDEC and NYCDEP interim guidance criteria were used to evaluate the significance of predicted project impacts on $PM_{2.5}$ concentrations from mobile sources and to determine the need to minimize PM emissions from the proposed project.

CONFORMITY REQUIREMENTS

The conformity requirements of the CAA and regulations promulgated thereunder (conformity requirements) limit the ability of federal agencies to assist, fund, permit, and approve transportation projects in nonattainment areas that do not conform to the applicable SIP. When subject to this regulation, a federal agency is responsible for demonstrating project conformity. At a federal level, conformity determinations must be made according to the requirements of 40 CFR Parts 51 and 93, and the conformity regulations fall into two categories: general conformity and transportation conformity. If any part of a federal action is related to transportation plans, programs, and projects developed, funded, or approved by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA) under title 23 U.S.C. or the Federal Transit Act (49 U.S.C. 1601), respectively, or requires approval by a recipient of federal transportation funds (e.g., the NYSDOT), transportation conformity requirements must be met. For all other federal agency actions subject to conformity, general conformity rules apply. As described in Chapter 1 “Project Description,” portions of the financing for the proposed project include funds from FHWA. Therefore, the proposed project falls under the category of transportation conformity, and must meet the transportation conformity requirements set forth under 40 CFR Parts 51 and 93.

An area’s Metropolitan Planning Organization (MPO), which is an entity responsible for transportation planning, together with the State, are responsible for demonstrating transportation conformity with respect to the SIP on Regional Transportation Plans (Plans) and Transportation Improvement Programs (TIPs). The USEPA must then concur with such conformity determinations. The U.S. Department of Transportation (USDOT) has final approval of conforming plans and TIPs.

The Plan is the official intermodal metropolitan transportation plan for an area that is developed through the metropolitan planning process for the urbanized area, and generally has a 20-year planning horizon. The TIP is a staged, multiyear, intermodal program of transportation projects developed by an MPO, which is consistent with the Plan. TIPs are generally for three to five years. There must be a currently conforming Plan and TIP in place at the time of National Environmental Policy Act (NEPA) process completion. Conformity to a SIP is defined as conformity to a Plan's purpose of eliminating or reducing the severity and number or violations of the NAAQS and achieving expeditious attainment of the standards. To meet conformity requirements, all regionally significant highway and transit projects must either come from a conforming TIP and Plan, have been included in a regional emissions analysis supporting the TIP and Plan’s conformity determination, or be included in a newly performed regional emissions analysis.

The New York Metropolitan Transportation Council (NYMTC) is the MPO for this region. On June 17, 2005, NYMTC determined that the Federal Fiscal Year (FFY) 2006-2010 TIP and FFY 2005-2030 Regional Transportation Plan conform to the SIP and the air quality milestones set forth under the CAA. FHWA and FTA then approved the Plan conformity determination on September 30, 2005, and USEPA concurred with the findings. Although the proposed project was not included in the current conforming 2006-2010 TIP, its design scope and concept will be considered in NYMTCs upcoming conformity determination, expected to be completed in April 2006.

A regional emissions analysis is presented below that demonstrates the regional emissions benefits related to the proposed project. The analysis shows that the proposed project would result in an overall decrease in total emissions for VOCs, NO_x, CO, PM_{10} and $PM_{2.5}$, thus supporting the SIP’s purpose of eliminating or reducing the severity and number of NAAQS violations and of achieving expeditious attainment of the standards.

D. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS

As mentioned above, the air quality analysis procedures suggested in the *CEQR Technical Manual* and NYSDOT’s *EPM* were used to assist in the development of the methodology and assessment of impacts in this air quality study.

MOBILE SOURCES

The prediction of vehicle-generated CO and PM concentrations in an urban environment incorporates meteorological phenomena, traffic conditions, and physical configurations. Air pollutant dispersion models mathematically simulate how traffic, meteorology, and geometry 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 it is necessary to predict the reasonable worst case condition, most of these dispersion models predict conservatively high concentrations of pollutants, particularly under adverse meteorological conditions.

The mobile source analyses for the proposed project employ a model approved by USEPA that has 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. The assumptions used in the PM analysis were based on the latest $PM_{2.5}$ interim guidance developed by the NYCDEP.

DISPERSION MODEL FOR MICROSCALE ANALYSES

Maximum CO concentrations adjacent to streets near the project site, resulting from vehicle emissions, were predicted using the CAL3QHC model Version 2.0.[1] The CAL3QHC model employs a Gaussian (normal distribution) dispersion assumption and includes an algorithm for estimating vehicular queue lengths at signalized intersections. CAL3QHC predicts emissions and dispersion of CO from idling and moving vehicles. The queuing algorithm includes site-specific traffic parameters, such as signal timing and delay calculations (from the 2000 *Highway Capacity Manual* traffic forecasting model), saturation flow rate, vehicle arrival type, and signal actuation (i.e., pre-timed or actuated signal) characteristics to accurately predict the number of idling vehicles. The CAL3QHC model has been updated with an extended module, CAL3QHCR, 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 CAL3QHC modeling.

To determine motor vehicle-generated PM concentrations adjacent to streets near the proposed project's study area, the CAL3QHCR model was applied. This refined version of the model can utilize hourly traffic and meteorology data, and is therefore more appropriate for calculating 24-hour and annual average concentrations.

METEOROLOGY

Tier I Analyses—CAL3QHC

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 accumulation of pollutants at a particular prediction location (receptor), and atmospheric stability accounts for the effects of vertical mixing in the atmosphere.

CO calculations were performed using the CAL3QHC model. 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 USEPA guidelines[2], CO 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 0.77 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, the wind angle that

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[1] *User's Guide to CAL3QHC, A Modeling Methodology for Predicted Pollutant Concentrations Near Roadway Intersections,* Office of Air Quality, Planning Standards, USEPA, Research Triangle Park, North Carolina, Publication USEPA-454/R-92-006.

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

maximized the pollutant concentrations was used in the analysis regardless of frequency of occurrence. These assumptions ensured that worst-case meteorology was used to estimate impacts.

Tier II Analyses—CAL3QHCR

A Tier II analysis performed with the CAL3QHCR model, which includes the modeling of hourly concentrations based on hourly traffic data and 5 years of monitored hourly meteorological data, was performed to predict maximum 24-hour and annual average PM levels. The data consists of surface data collected at LaGuardia Airport and upper air data collected at Brookhaven, New York for the period 1999-2003. All hours were modeled, and the highest resulting concentration for each averaging period is presented.

ANALYSIS YEAR

Carbon Monoxide

The microscale analysis for CO was performed for Existing Conditions (baseline year), future year conditions without the proposed project (No Build conditions), and future conditions with the proposed project (Build conditions). The analysis years for future year conditions were determined using the methodology described below.

Based on the guidance provided in the *EPM*, mobile source air quality analyses are to be performed for the year or years that are likely to generate the highest level of emissions. If the analyses demonstrate that the proposed project would not cause an air quality impact for these years, then no air quality impact would be expected in any other year.

For projects located in CO non-attainment or maintenance areas the analysis is to be performed for the project's build year, also known as the Estimated Time of Completion (ETC) and the critical analysis year of ETC+10 or ETC+20. While traffic volumes increase in future years, this analysis determines if regional emissions in years after ETC would be offset by increased reductions in on-street tailpipe emissions.

For this analysis, two reasonable worst-case development scenarios for the proposed project were analyzed. Scenario 1 includes the development of Phase I by 2010 and the Phase II development of a 1 million-zoning-square-foot commercial overbuild by 2015. Scenario 2 includes the development of Phase I by 2010 and the Phase II development of a residential or mixed-use building of up to 1.1 million gross square feet on the Development Transfer Site, which would be constructed concurrently with Phase I and completed by 2010. Therefore, to consider the impacts of both possible scenarios, the mobile source air quality analysis examines two future Build (or ETC) years:

- 2010 (Scenario 2)—includes Phase I and the Phase II development on the Development Transfer Site.
- 2015 (Scenario 1)—includes Phase I and the Phase II development of a commercial overbuild on the Western Annex.

This analysis does not assume that both Phase II developments would be present in the year 2015. If the Development Transfer Site building is constructed in 2010, there would be no commercial overbuild on the Western Annex in 2015. Similarly, if the commercial overbuild is built on the Western Annex in 2015, the Development Transfer Site building would not be constructed.

Based on the *EPM* guidance above, an analysis would be required for the two ETC years of 2010 and 2015, and the critical analysis year of either (ETC+10) or (ETC+20). The corridor emissions analyses for the year 2025 were conducted using traffic information representative of conditions expected with the implementation of the Hudson Yards Rezoning and Redevelopment Plan (Hudson Yards). The volumes for the 2035 analysis year were determined using a growth rate of 0.5 percent in accordance with *CEQR* guidelines. The year with the highest level of emissions from these two future years was determined to be the worst-case critical analysis year.

The critical analysis year was determined based on traffic volumes and free flow speeds at the intersection of Eighth Avenue and West 33rd Street. This intersection was selected as a reasonable representation of a typical intersection in the study area. Emission factors for the critical analysis year were obtained from the Carbon Monoxide Emission Factor Table EF2 of the *EPM*. For the critical analysis year determination, a speed of 5 mph was used for traffic on -all approaches at the intersection of Eighth Avenue and West 33rd Street. The emission factors, traffic volumes, and total emission strength for 2025 and 2035 are shown in Table 15-2.

As shown in Table 15-2, the worst-case critical analysis year for the CO air quality analysis, which is the future year that resulted in the highest total emission strengths, was determined to be the year 2035. Thus, the CO microscale analysis was performed for three analysis years: 2010, 2015, and 2035.

Table 15-2
CO Corridor Emissions Analysis

Year	Emission factor (g/veh-mi)	Traffic Volume (vph)	Total Emission Strength (g/mi-hr)
Eighth Avenue			
2025	7.56	2,377	17,972
2035	7.44	2,498	18,577
West 33rd Street			
2025	7.50	946	7,096
2035	7.38	976	7,202
Totals			
2025	NA	3,323	25,068
2035	NA	3,474	25,778
Notes: NA-Not Applicable			

Particulate Matter

The microscale analysis for PM was performed for both 2015 No Build and 2015 Build conditions. The analysis was performed for the 2015 analysis year, because Scenario 2 of the proposed project was determined to be the reasonable worst-case development scenario with the greatest number of project-generated truck trips. It is expected that potential impacts from PM emissions would be less for all other analysis years.

VEHICLE EMISSIONS DATA

Engine Emissions

Vehicular CO and PM emission factors were computed using the USEPA mobile source emissions model, MOBILE6.2[1]. This emissions model is capable of calculating engine emission

[1] USEPA, User's Guide to MOBILE6.1 and MOBILE6.2: Mobile Source Emission Factor Model, USEPA420-R-02-028, October 2002.

factors for various vehicle types, based on the fuel (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 MOBILE6.2 incorporates the most current guidance available from the NYSDEC and NYCDEP. An ambient temperature of 50° Fahrenheit was used in accordance with *CEQR* guidelines.

Vehicle classification data were based on field studies conducted as part of this EIS and the Hudson Yards Final Generic EIS (FGEIS). Appropriate credits were used to accurately reflect the inspection and maintenance programs that require inspections of automobiles and light trucks to determine if pollutant emissions from the vehicles' exhaust systems are below emission standards. Vehicles failing the emissions test must undergo maintenance and pass a repeat test to be registered in New York State.

Road Dust

The contribution of re–entrained road dust to PM_{10} concentrations, as presented in the PM_{10} SIP, is considered to be significant; therefore, the PM_{10} estimates include both exhaust and road dust. Road dust emission factors were calculated according to the latest procedure delineated by USEPA.[1] In accordance with the NYCDEP $PM_{2.5}$ interim guidance criteria, emission rates were determined with fugitive road dust to account for their impacts in local microscale analyses. However, fugitive road dust was not included in the neighborhood scale $PM_{2.5}$ microscale analysis, since it is considered to be an insignificant contribution on that scale.

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 13, "Traffic and Parking"). Traffic data for the future without and with the proposed project were employed in the respective air quality modeling scenarios. The weekday PM (5 to 6 PM) and Saturday Midday (1 to 2 PM) peak periods were subjected to microscale analysis. These time periods were selected for the mobile source analysis to represent reasonable worst-case conditions when considering total traffic volumes, Level of Service (LOS), and project-generated traffic at each of the intersections selected for analysis.

For particulate matter, the peak weekday AM, midday, and PM period traffic volumes were used as a baseline; traffic volumes for other hours due to No Build traffic and project-generated traffic were determined by adjusting the peak period volumes by the 24-hour distributions of actual vehicle counts collected for the project. PM impacts were determined by using the 24-hour distribution associated with the highest total daily vehicle count**.**

BACKGROUND CONCENTRATIONS

Background concentrations are those pollutant concentrations not directly accounted for through the modeling analysis, which directly account for vehicle-generated emissions on the streets within 1,000 feet and line-of-sight of the receptor location. Background concentrations must be added to modeling results to obtain total pollutant concentrations at a study site.

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[1] EPA, Compilations of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, Draft Ch. 13.2.1, NC, http://www.epa.gov/ttn/chief/ap42, December 2003.

The 8-hour average background concentration used in this analysis was 2.9 ppm for all analysis years. This value, obtained from NYCDEP, is based on CO concentrations measured at NYSDEC monitoring stations and is adjusted to reflect the reduced vehicular emissions expected in the analysis year. For purposes of this adjustment, based on USEPA guidance, it was assumed that 20 percent of the background value is caused by stationary source emissions that have remained relatively unchanged with time and that 80 percent of the background value is caused by mobile sources that decrease with time. This decrease reflects the increasing numbers of federally mandated lower-emission vehicles that are projected to enter the vehicle fleet as older, higher-polluting vehicles are retired (i.e., vehicle turnover), and the continuing benefits of the New York State inspection and maintenance program.

The PM_{10} annual and 24-hour background concentrations are based on the highest and second highest concentrations, respectively, measured over the most recent 3-year period at the nearest NYSDEC background monitoring station. For the proposed project, the background concentrations for the annual and 24-hour periods are 19 $\mu g/m^3$ and 50 $\mu g/m^3$, respectively. For $PM_{2.5}$, background concentrations are not considered, since impacts are determined on an incremental basis only.

MOBILE SOURCE ANALYSIS SITES

A total of four analysis sites were selected for microscale analysis (see Table 15-3 and Figure 15-1). These intersections were selected based on levels of project-generated traffic and overall level of service, and are therefore the locations where the greatest air quality impacts and maximum changes in concentrations would be expected. Each of these intersections was analyzed for CO. Analysis Site 3 was analyzed for potential impacts of $PM_{2.5}$ and PM_{10}. This site was predicted to have the highest overall project–generated truck traffic.

Table 15-3
Mobile Source Analysis Intersection Locations

Analysis Site	Location
1	Eighth Avenue and West 31st Street
2	Eighth Avenue and West 30th Street
3	Ninth Avenue and West 31st Street
4	Eighth Avenue and West 33rd Street

RECEPTOR LOCATIONS

Multiple receptors (i.e., precise locations at which concentrations are predicted) were modeled at each of the selected sites; receptors were placed along the approach and departure links at spaced intervals. The receptors were placed at sidewalk or roadside locations near intersections with continuous public access. Receptors in the annual $PM_{2.5}$ neighborhood scale analysis were placed at a distance of 15 meters from the nearest moving lane, based on the current NYCDEP guidance.

RELATIONSHIP WITH OTHER AREA ACTIONS - HUDSON YARDS REZONING AND REDEVELOPMENT PLAN

As mentioned in Chapter 2, “Analytical Framework,” this EIS utilizes the relevant information from the Hudson Yards FGEIS, with updated information as appropriate. For this analysis, much of the baseline assumptions reflect the original data gathering and surveys conducted for the Hudson Yards Rezoning FGEIS. Relevant information from the Hudson Yards FGEIS was also utilized for the future year analyses. Both the development program analyzed in the Hudson Yards FGEIS and the proposed project have an initial operational start in 2010, while the full build-out of the Hudson Yards-generated development was examined for a 2025 analysis year. Therefore, for the proposed project's 2015 analysis year, the Hudson Yards FGEIS 2025 findings were adjusted as necessary.

The results of the Hudson Yards FGEIS indicated that no significant air quality impacts would occur from mobile sources; however, the intersections analyzed in the Hudson yards FGEIS are different than those analyzed for the proposed project (see Table 15-3). As presented in this chapter, the proposed project is not expected to result in significant adverse impacts at any of the locations analyzed in the EIS, and since the project-generated traffic would be lower at the intersections analyzed for air quality impacts in the Hudson Yards FGEIS, it is not expected that the proposed project would have significant adverse air quality impacts at those Hudson Yards FGEIS intersections.

STATIONARY SOURCES

INDUSTRIAL SOURCES

Since Phase I of the proposed project would include hotel uses and Phase II under Scenario 2 would include hotel and residential uses on the Development Transfer Site, an assessment was conducted to determine the potential for impacts due to industrial activities within the project area on sensitive receptors associated with the proposed project. The proposed hotel and residential uses are considered sensitive uses. Therefore, pollutants emitted from the exhaust vents of existing permitted industrial facilities were examined to identify potential adverse impacts on future residents generated by the proposed project.

Data Collection

All industrial air pollutant emission sources within 400 feet of the proposed project boundaries were considered for inclusion in the air quality impact analyses. These boundaries were used to identify the extent of the study area for determining air quality impacts associated with the proposed project.

A request was made to NYCDEP's Bureau of Environmental Compliance (BEC) to obtain the most current information regarding the release of air pollutants from all existing manufacturing or industrial sources within the entire study area. The NYCDEP air permit data provided was compiled into a database of source locations, air emission rates, and other data pertinent to determining source impacts. A comprehensive search was also performed to identify NYSDEC Title V permits and permits listed in the USEPA Envirofacts database.[1] Facilities that appeared in the Envirofacts database but did not also possess a NYCDEP certificate to operate were cross-referenced against NYSDEC's Air Guide-1 software emissions database, which presents a statewide compilation of permit data for toxic air pollutants, to obtain emissions data and stack parameters.

A field survey was conducted on March 3, 2005, to determine the operating status of permitted industries and identify any potential industrial sites not included in the permit databases. The results of the field survey were compared against NYCDEP data sources.

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[1] USEPA, Envirofacts Data Warehouse, http://oaspub.epa.gov/enviro/ef_home2.air, March 4, 2005.

Dispersion Modeling

Potential impacts from industrial sources on the sensitive uses of the proposed development program were evaluated using the Industrial Source Complex Short Term (ISCST3) dispersion model, developed by USEPA[1]. The ISCST3 model calculates pollutant concentrations from one or more points (e.g., exhaust stacks) based on emission rates, source parameters, and hourly meteorological data. Computations with the ISCST3 model to predict concentrations from exhaust stacks were made assuming stack tip downwash, buoyancy-induced dispersion, gradual plume rise, urban dispersion coefficients and wind profile exponents, no collapsing of stable stability classes, and elimination of calms. Since the highest concentrations were predicted to occur on elevated (flagpole) receptors, the ISCST3 model was run without downwash. The meteorological data set consisted of five years of meteorological data: surface data collected at LaGuardia Airport (1999-2003) and concurrent upper air data collected at Brookhaven, Suffolk County, New York.

Discrete receptors (i.e., locations at which concentrations were calculated) were placed on the Farley Complex site and the Development Transfer Site. The receptor network consisted of receptors located at spaced intervals along the sides of the Farley Complex and the Development Transfer Site buildings from the ground floor to the roofline and at other publicly accessible ground level locations.

Emission rates and stack parameters, obtained from the NYCDEP permits, were input into the ISCST3 dispersion model.

Predicted worst-case impacts were compared with the short-term and annual guideline concentrations (SGCs and AGCs) recommended in *NYSDEC's DAR-1 AGC/SGC Tables*.[2] These guideline concentrations are applied as screening thresholds to determine if the proposed project could be significantly impacted by nearby air pollution sources.

To assess the effects of multiple sources emitting the same pollutants, cumulative source impacts were determined. Concentrations of the same pollutant from industrial sources that were within 400 feet of the Farley Complex and Development Transfer Site were combined and compared to the guideline concentrations discussed above.

REGIONAL EMISSIONS ANALYSIS

To determine the emissions benefits that the proposed project would have on air quality by increasing rail ridership, thereby reducing vehicular traffic once it is operating, pollutant burdens were computed—pollutant burdens represent total expected quantities of regional pollutant emissions for a defined time and provide an indication of the general change in air quality. Criteria pollutants and precursor emissions measured include NO_x, VOCs, CO, PM_{10} and $PM_{2.5}$. The reductions in annual pollutant emissions due to the proposed project were based on the USEPA's mobile source emissions model (MOBILE6.2) in conjunction with the vehicle-miles traveled (VMT) reduction estimates due to the project. Potential VMT reductions (or additions) related to the proposed project can be attributed to the following project elements:

- New Jersey Transit (NJT) and Amtrak-induced ridership;

[1] USEPA, *User's Guide for the Industrial Source Complex (ISC3) Dispersion Models*, USEPA-454/B-95-003a, NC, September 1995 and Addendum February 2002.

[2] NYSDEC Division of Air Resources, December 22, 2003.

- Two-seat ride program to area airports with remote check-in at Moynihan Station;
- Reduced taxi circulation and additional taxi idling due to new taxi bay(s); and
- Reduction of USPS truck idling while entering loading docks.

Each of these project elements are associated with changes in VMT that are then used to estimate the overall regional emissions reductions of the pollutants of concern. A discussion of each of the project elements and the modeling assumptions used in the analysis are presented below.

NJT AND AMTRAK-INDUCED RIDERSHIP

This project element addresses the emissions benefits from NJT and Amtrak-related induced ridership due to station improvements. Emission benefits are calculated to represent the vehicle emissions saved from passengers who would normally use motor vehicles as their mode of transportation along each segment, but would instead choose to travel by rail due to the station improvements proposed as part of the project.

TWO-SEAT RIDE PROGRAM TO AREA AIRPORTS WITH REMOTE CHECK-IN AT PENN STATION

The proposed project proposes to establish a remote check-in service at the new Moynihan Station to allow passengers to check their baggage at the station and potentially travel to area airports (JFK and Newark Liberty) via rail with a connection to the AirTrain. This project element addresses the vehicle emissions saved from airport passengers who would normally use motor vehicles or taxis as their mode of transportation to either JFK or Newark Liberty Airports from Manhattan, but would instead choose rail travel with a connection to the AirTrain. Although the two-seat ride program would not be available to passengers bound for LaGuardia Airport, those passengers would have the option, starting in 2015, to use the remote check-in service at Moynihan Station. Therefore, the regional emissions analysis also addresses the additional emissions generated from trucks transporting luggage from Moynihan Station to LaGuardia Airport. It also addresses the additional truck emissions generated from trucks transporting luggage associated with the remote check-in at Moynihan Station to JFK and Newark Liberty Airports starting in 2010.

REDUCED TAXI CIRCULATION AND ADDITIONAL TAXI IDLING (DUE TO NEW TAXI BAY)

As part of the proposed project, a new taxi bay will be created on the midblock of West 31st Street and/or West 33rd Street for improved taxi drop-off and pick-up operations at Moynihan Station. As a result, vehicle emissions would be reduced from taxis that no longer circulate through midtown Manhattan searching for passengers to pick-up. However, additional taxi emissions would be generated from taxis idling at the taxi bay(s) as they arrive, pick-up/drop-off passengers and depart. Therefore, this project calculates the emissions benefits from the reduced taxi circulation, and the additional emissions from idling taxis.

REDUCTION OF USPS TRUCK IDLING WHILE ENTERING LOADING DOCKS

This project element calculates the benefits realized from the removal of idling USPS trucks from Ninth Avenue. Without the proposed project, an average of 10 USPS trucks per hour (for 12 hours per day) would idle on Ninth Avenue waiting to enter the loading areas at the Western

Annex. In order to facilitate the proposed project, trucking activities have been consolidated at the Morgan Annex nearby, so that these trucks are no longer idling on local streets. Instead of waiting to enter the constricted truck loading entrance at the Farley Complex's Ninth Avenue facade, these trucks now proceed directly to the Morgan Annex, where they are able to go directly into the building to loading areas, and shut down.

ANALYSIS ASSUMPTIONS

Analysis Years

The regional emissions analysis was conducted for the transportation conformity years: 2007, 2010, 2020, 2025, 2028 and 2030.

Emissions Models

Vehicular emissions for all pollutants were computed using the EPA's MOBILE6.2 mobile source emissions model.

Temperature

Emissions estimates for CO, PM_{10} and $PM_{2.5}$ were calculated for the winter season, at a temperature of 50ºF. Summer season emissions for NO_x and VOCs were calculated at a temperature of 78.3ºF

Vehicle Classifications

EPA's MOBILE6.2 mobile source emissions model was used to determine the emission factors for light-duty gas vehicles (LDGV) to represent passenger vehicles such as autos, taxis and SUVs, and heavy-duty gas vehicles (HDGV6, HDGV7, HDGV8A, HDGV8B, HDDV6, HDDV7, HDDV8A, and HDDV8B).

Vehicle Speeds

Regional traffic speeds used in the MOBILE6.2 model were based on average speed data from NYMTC's October 2005 Conformity Regional Analysis to represent the average speed for each conformity analysis year, in each county and type of roadway being analyzed.

E. EXISTING CONDITIONS

EXISTING MONITORED AIR QUALITY CONDITIONS (2004)

Monitored concentrations of CO, SO_2, particulate matter, NO_2, lead, and ozone ambient air quality data for the area are shown in Table 15-4. These values are the most recent monitored data that have been made available by NYSDEC for nearby monitoring stations. There were no monitored violations of the NAAQS for the pollutants at these sites in 2004 with the exception of the annual standard for $PM_{2.5}$.

Table 15-4
Representative Monitored Ambient Air Quality Data

Pollutants	Location	Units	Period	Concentrations			Number of Exceedances of Federal Standard	
				Mean	Highest	Second Highest	Primary	Secondary
CO	PS 59	ppm	8-hour	-	2.1	2.0	0	-
			1-hour	-	2.9	2.6	0	-
SO_2	PS 59	ppm	Annual	0.10	-	-	0	-
			24-hour	-	0.037	0.033	0	-
			3-hour	-	0.087	0.056	-	0
Respirable Particulates (PM_{10})	JHS 126	µg/m^3	Annual	17	-	-	0	0
			24-hour	-	47	32	0	0
Respirable Particulates ($PM_{2.5}$)	PS 59	µg/m^3	Annual	15.6	-	-	-	-
			24-hour	-	47.6	42.5	0	0
NO_2	PS 59	ppm	Annual	0.035	-	-	0	0
Lead	Susan Wagner	µg/m^3	3-month	-	0.01	0.01	0	0
O_3	IS 52	ppm	1-hour	-	0.094	0.091	0	0

Source: *2004 Annual New York State Air Quality Report*, NYSDEC 2005.

MODELED EXISTING POLLUTANT CONCENTRATIONS—CO EMISSIONS FROM MOBILE SOURCES

As noted previously, receptors were placed at multiple sidewalk locations next to the intersections under analysis. The receptor with the highest predicted CO concentrations was used to represent these intersection sites for the existing conditions. CO concentrations were calculated for each receptor location, at each intersection, for each peak period specified above.

Table 15-5 shows the maximum modeled existing CO 8-hour average concentrations at these intersections. (No 1-hour values are shown since predicted values are much lower than the standard.) At all receptor sites, the maximum predicted 8-hour average concentrations are within the national standard of 9 ppm.

F. FUTURE WITHOUT THE PROPOSED ACTION

MOBILE SOURCES

CARBON MONOXIDE

CO concentrations without the proposed project were determined for the 2010, 2015 and 2035 analysis years using the methodology previously described. Presented below are the future maximum predicted 8-hour average CO concentrations in each analysis year of the Future Without the Proposed Action at the selected analysis intersections in the project study area. The values shown are the highest predicted concentrations for the receptor locations for each of the time periods analyzed.

Table 15-5
Baseline Maximum Predicted 8-Hour
Average Carbon Monoxide Existing Concentrations
(parts per million)

Site	Location	Time Period	Existing 8-Hour Concentration (ppm)
1	Eighth Avenue and West 31st Street	Weekday PM	5.4
		Saturday MD	5.0
2	Eighth Avenue and West 30th Street	Weekday PM	5.5
		Saturday MD	4.9
3	Ninth Avenue and West 31st Street	Weekday PM	5.6
		Saturday MD	4.7
4	Eighth Avenue and West 33rd Street	Weekday PM	6.7
		Saturday MD	5.9

Notes:
8-hour CO standard is 9 ppm.
An adjusted ambient background concentration of 2.9 ppm is included in the existing values presented above.

2010 Analysis Year

Table 15-6 presents the maximum predicted 8-hour average CO No Build concentrations for the 2010 analysis year. As indicated in the table, the No Build concentrations are below the corresponding standard of 9 ppm.

Table 15-6
2010 Maximum Predicted 8-Hour
Average Carbon Monoxide No Build Concentrations
(parts per million)

Site	Location	Time Period	No Build 8-Hour Concentration (ppm)
1	Eighth Avenue and West 31st Street	Weekday PM	4.8
		Saturday MD	4.6
2	Eighth Avenue and West 30th Street	Weekday PM	4.8
		Saturday MD	4.4
3	Ninth Avenue and West 31st Street	Weekday PM	4.7
		Saturday MD	4.4
4	Eighth Avenue and West 33rd Street	Weekday PM	5.4
		Saturday MD	4.9

Notes:
8-hour CO standard is 9 ppm.
An adjusted ambient background concentration of 2.9 ppm is included in the No Build values presented above.

2015 Analysis Year

Table 15-7 presents the maximum predicted 8-hour average CO No Build concentrations for the 2015 analysis year. As indicated in the table, the No Build concentrations are below the corresponding standard of 9 ppm.

Table 15-7
2015 Maximum Predicted 8-Hour
Average Carbon Monoxide No Build Concentrations
(parts per million)

Site	Location	Time Period	No Build 8-Hour Concentration (ppm)
1	Eighth Avenue and West 31st Street	Weekday PM	4.7
		Saturday MD	4.4
2	Eighth Avenue and West 30th Street	Weekday PM	4.7
		Saturday MD	4.3
3	Ninth Avenue and West 31st Street	Weekday PM	4.6
		Saturday MD	4.2
4	Eighth Avenue and West 33rd Street	Weekday PM	5.3
		Saturday MD	4.7

Notes:
8-hour CO standard is 9 ppm.
An adjusted ambient background concentration of 2.9 ppm is included in the No Build values presented above.

2035 Analysis Year

Table 15-8 presents the maximum predicted 8-hour average CO No Build concentrations for the 2035 analysis year. As indicated in the table, the No Build concentrations are below the corresponding standard of 9 ppm.

Table 15-8
2035 Maximum Predicted 8-Hour
Average Carbon Monoxide No Build Concentrations
(parts per million)

Site	Location	Time Period	No Build 8-Hour Concentration (ppm)
1	Eighth Avenue and West 31st Street	Weekday PM	4.7
		Saturday MD	4.4
2	Eighth Avenue and West 30th Street	Weekday PM	4.7
		Saturday MD	4.3
3	Ninth Avenue and West 31st Street	Weekday PM	5.0
		Saturday MD	4.3
4	Eighth Avenue and West 33rd Street	Weekday PM	5.4
		Saturday MD	4.7

Notes:
8-hour CO standard is 9 ppm.
An adjusted ambient background concentration of 2.9 ppm is included in the No Build values presented above.

PM_{10}

PM_{10} concentrations without the proposed project were determined for the 2015 analysis year using the methodology previously described. Table 15-9 presents the future maximum predicted

Table 15-9
2015 Maximum Predicted PM_{10} No Build Concentrations

Site	Location	24-Hour Concentration μg/m³	Annual Concentration μg/m³
3	Ninth Avenue and West 31st Street	60.34	22.75
Note:	24-hour standard 150 μg/m³; Annual standard 50μg/m³. Includes background concentrations of 50 μg/m³ and 19 μg/m³ for the 24-hour and annual averaging periods, respectively.		

24-hour average and annual average PM_{10} concentrations in the Future Without the Proposed Action at the selected analysis intersection in the project study area. The values shown are the highest predicted concentrations for the receptor locations for each of the time periods analyzed. As indicated in the table, the No Build concentrations are below the corresponding standards of 150 μg/m³ and 50 μg/m³ for the 24-hour and annual averaging periods, respectively.

G. FUTURE WITH THE PROPOSED ACTION

MOBILE SOURCES

CARBON MONOXIDE

CO concentrations with the proposed project were determined for the 2010, 2015 and 2035 analysis years using the methodology previously described. As described above, the 2010 analysis year considered the potential impacts from the proposed development under Scenario 2 (Phase I and the Phase II development on the Development Transfer Site). The 2015 and 2035 analysis years considered the potential impacts from the proposed development under Scenario 1 (Phase I and the Phase II overbuild on the Western Annex). Presented below are the future maximum predicted 8-hour average CO concentrations in each analysis year at the selected project study area analysis intersections.

The values shown are the highest predicted concentration for each of the time periods analyzed. Also shown in the tables is the *de minimis* criteria used to determine the significance of the incremental increase in CO concentrations that would result from the proposed project. The *de minimis* criteria are derived using procedures outlined in the *CEQR Technical Manual* that set a minimum allowable change in 8-hour average CO concentrations due to the proposed project.

The results indicate that in the Future With the Proposed Action, there would be no potentially significant adverse mobile source air quality impacts (i.e., *de minimis* criteria were not exceeded). In addition, in the Future Without and the Future With the Proposed Action in 2010, 2015, or 2035 analysis years, maximum predicted ambient CO concentrations at the intersections analyzed would be less than the corresponding ambient air quality standards.

2010 Analysis Year

Table 15-10 presents the maximum predicted 8-hour average CO Build concentrations for the 2010 analysis year. As indicated in the table, the Build concentrations are below the corresponding standard of 9 ppm, and the *de minimis* criteria would not be exceeded.

Table 15-10
2010 Maximum Predicted 8-Hour Average
Carbon Monoxide Build Concentrations (parts per million)

Site	Location	Time Period	2010 Build 8-Hour Concentration[a] (ppm)	Not-To-Exceed *De minimis* Criteria[b] (ppm)
1	Eighth Avenue and West 31st Street	Weekday PM	4.7	6.9
		Saturday MD	4.7	6.8
2	Eighth Avenue and West 30th Street	Weekday PM	4.9	6.9
		Saturday MD	4.7	6.7
3	Ninth Avenue and West 31st Street	Weekday PM	4.8	6.9
		Saturday MD	4.5	6.7
4	Eighth Avenue and West 33rd Street	Weekday PM	5.4	7.2
		Saturday MD	5.1	7.0

Notes:
[a] An adjusted ambient background concentration of 2.9 ppm is included in the project build values presented above.
[b] The not-to-exceed value is derived by adding the minimum acceptable increase of CO concentrations (set forth in the *CEQR Technical Manual*) to the No Build concentration.
8-hour CO standard is 9 ppm.

2015 Analysis Year

Table 15-11 presents the maximum predicted 8-hour average CO Build concentrations for the 2015 analysis year. As indicated in the table, the Build concentrations are below the corresponding standard of 9 ppm, and the *de minimis* criteria would not be exceeded.

Table 15-11
2015 Maximum Predicted 8-Hour Average
Carbon Monoxide Build Concentrations (parts per million)

Site	Location	Time Period	2015 Build 8-Hour Concentration[a] (ppm)	Not-To-Exceed *De minimis* Criteria[b] (ppm)
1	Eighth Avenue and West 31st Street	Weekday PM	4.7	6.9
		Saturday MD	4.4	6.7
2	Eighth Avenue and West 30th Street	Weekday PM	4.7	6.8
		Saturday MD	4.5	6.6
3	Ninth Avenue and West 31st Street	Weekday PM	4.7	6.8
		Saturday MD	4.4	6.6
4	Eighth Avenue and West 33rd Street	Weekday PM	5.3	7.1
		Saturday MD	5.0	6.9

Notes:
[a] An adjusted ambient background concentration of 2.9 ppm is included in the project build values presented above.
[b] The not-to-exceed value is derived by adding the minimum acceptable increase of CO concentrations (set forth in the *CEQR Technical Manual*) to the No Build concentration.
8-hour CO standard is 9 ppm.

2035 Analysis Year

Table 15-12 presents the maximum predicted 8-hour average CO Build concentrations for the 2035 analysis year. As indicated in the table, the Build concentrations are below the corresponding standard of 9 ppm, and the *de minimis* criteria would not be exceeded.

Table 15-12
2035 Maximum Predicted 8-Hour Average
Carbon Monoxide Build Concentrations (parts per million)

Site	Location	Time Period	2035 Scenario 1 Build 8-Hour Concentration[a] (ppm)	Not-To-Exceed *De minimis* Criteria[b] (ppm)
1	Eighth Avenue and West 31st Street	Weekday PM	4.7	6.9
		Saturday MD	4.7	6.7
2	Eighth Avenue and West 30th Street	Weekday PM	5.0	6.8
		Saturday MD	4.5	6.6
3	Ninth Avenue and West 31st Street	Weekday PM	5.1	7.0
		Saturday MD	4.7	6.6
4	Eighth Avenue and West 33rd Street	Weekday PM	5.7	7.2
		Saturday MD	4.9	6.9

Notes:
[a] An adjusted ambient background concentration of 2.9 ppm is included in the project build values presented above.
[b] The not-to-exceed value is derived by adding the minimum acceptable increase of CO concentrations (set forth in the *CEQR Technical Manual*) to the No Build concentration.
8-hour CO standard is 9 ppm.

PM_{10}

PM_{10} concentrations with the proposed project were determined for the 2015 analysis year using the methodology previously described. Table 15-13 presents the future maximum predicted 24-hour average and annual average PM_{10} concentrations at the selected analysis intersection in the project study area. The values shown are the highest predicted concentrations for the receptor locations for each of the time periods analyzed. As indicated in the table, the Build concentrations are below the corresponding standards of 150 $\mu g/m^3$ and 50 $\mu g/m^3$ for the 24-hour and annual averaging periods, respectively.

Table 15-13
2015 Maximum Predicted
PM_{10} Build Concentrations (parts per million)

Site	Location	24-Hour Concentration $\mu g/m^3$	Annual Concentration $\mu g/m^3$
3	Ninth Avenue and West 31st Street	88.32	32.78

Note: 24-hour standard 150 $\mu g/m^3$; Annual standard 50$\mu g/m^3$. Includes background concentrations of 50 $\mu g/m^3$ and 19 $\mu g/m^3$ for the 24-hour and annual averaging periods, respectively.

$PM_{2.5}$

$PM_{2.5}$ concentrations with and without the proposed project were determined for the 2015 analysis year using the methodology previously described. The results of this analysis are presented in Table 15-14 for the 24-hour and annual time periods. As indicated in the table, the predicted incremental increases of $PM_{2.5}$ concentrations for both time periods are under the corresponding interim guidance levels. Therefore, the proposed project is not considered to have significant $PM_{2.5}$ impacts, and no additional modeling is required for this pollutant.

Table 15-14
2015 Maximum Predicted Incremental 24-Hour and Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)

Receptor Site	Location	Neighborhood Scale Analysis Annual Increment	Localized Analysis 24-Hour Increment
3	Ninth Avenue and West 31st Street	0.02	0.39
$PM_{2.5}$ Interim Guidance Criteria: Annual Average (Neighborhood Scale)—0.1 $\mu g/m^3$ 24-Hour (Localized)—5.0 $\mu g/m^3$			

STATIONARY SOURCES

INDUSTRIAL SOURCES

A detailed analysis of industrial source impacts was undertaken to analyze potential impacts on the Phase I hotel use and the Phase II (under Scenario 2) hotel and residential uses, following the methodology previously described. A field survey was conducted and land use information was reviewed to identify manufacturing and industrial uses within 400 feet of the Farley Complex and Development Transfer Site. Addresses with potential industrial emissions were identified based on existing on-site businesses, as well as the presence of visible venting apparatus.

At the nine addresses identified to have the potential for pollutant emissions, a total of twenty-four businesses are on file with BEC and are determined to have potential air pollutant emissions. Table 15-15 shows the air contaminants, estimated emissions, calculated concentrations, and the respective, recommended short-term (a 1-hour period, unless otherwise noted) and annual guideline concentrations. The concentrations shown represent worst-case predicted impacts on the proposed project's sensitive uses.

The detailed analyses used to estimate maximum potential impacts from these businesses showed that their operations would not result in any predicted violations of the NAAQS or any exceedances of the recommended SGC or AGC. Therefore, based on data available for the surrounding industrial uses, the proposed project would not experience significant air quality impacts from these facilities.

H. REGIONAL EMISSIONS ANALYSIS

A regional emissions analysis was conducted following the methodology previously described. For each pollutant, Table 15-16 presents the total potential emissions benefits due to the project elements of the proposed project in each of the analysis years considered.

Table 15-15
Industrial Source Analysis—Summary of Maximum Predicted Concentrations

Potential Contaminants	Estimated Short-Term Impact (ug/m³)	SGC[a] (ug/m³)	Estimated Long-Term Impact (ug/m³)	AGC[*] (ug/m³)
Acetic Acid	0.20975	3,700	0.0009	60
Ammonia	91.45	2,400	0.2763	100
Carbon Monoxide	0.08	14,000	0.0006	--
Copper Cyanide	0.14	380	0.0003	50
Dichloromethatne	2.89	14,000	0.0288	2.1
Dimethyl Ketone	12.62	180,000	0.1197	28,000
Ethane	0.55	--	0.0034	110,000
Ethylene Glycol	1.64	10,000	0.0156	400
Ethylene Glycol Monobutyl Ether	50.31	420	0.4786	230
Hydrogen Cyanide	0.12	520	0.0009	3
Hydroquinone	0.21	--	0.0009	4.8
Isopropyl Alcohol	964.68	98,000	11.0454	7,000
Lead	1.17	--	0.0082	0.38
Methanol	38.05	33,000	0.1264	4,000
Particulate Matter	77.22	380	0.4946	50
Phosphoric Acid Mist	0.25	300	0.0024	10
Sodium Cyanide	0.24	380	0.0021	50
Sodium Hydroxide	0.21	200	0.0020	--
Sulfuric Acid Mist	0.14	120	0.0006	1
Zinc Chloride	0.05	200	0.0003	2.4

Notes:
* NYSDEC DAR-1 (Air Guide-1) AGC/SGC Tables, December 2003.
AGC-Annual Guideline Concentrations
SGC-Short-term Guideline Concentrations

Table 15-16
Regional Emissions Analysis – Annual Pollutant Emissions Reductions (tons/year)

Year	Annual Emissions Reductions (tons/year)				
	NO_x	VOCs	CO	PM_{10}	$PM_{2.5}$
2007	-0.09	-0.04	-0.31	-0.002	-0.002
2010	-5.14	-3.24	-53.18	-0.213	-0.127
2020	-1.97	-1.73	-47.89	-0.174	-0.086
2025	-1.39	-1.39	-44.51	-0.169	-0.081
2028	-1.26	-1.38	-44.14	-0.168	-0.080
2030	-1.10	-1.35	-44.10	-0.167	-0.079

The regional analysis shows that the proposed project would result in an overall decrease in total emissions for VOCs, NO_x, CO, PM_{10} and $PM_{2.5}$ in each of the conformity analysis years. Thus, the proposed project would not have significant adverse impacts from mobile source or regional emissions, and would be consistent with the New York State Implementation Plan for the control of ozone and CO. ✷