A. INTRODUCTION

The applicant is proposing a mixed-use development at 770 Eleventh Avenue, a 94,463 sf property bounded by Eleventh Avenue on the west, W. 54th Street on the north, and W. 53rd Street on the south. The project site, comprised of Block 1082, Lot 1, is located in the Clinton section of Manhattan Community District 4. Figures 1-1 and 1-2, in Chapter 1, "Project Description," show the project location.

The proposed action would facilitate approximately 1.3 million gross square feet (gsf) of mixed-use development rising to a maximum of 32 stories, including two mechanical levels above the top residential story, plus three cellar levels. It would include the following uses (all approximate): 900 dwelling units (DUs) (on floors 3 through 30), 8,800 gsf of retail, intended to be an 8,000 sf food market and a separate 800 sf retail space (on ground floor); 20,000 gsf of health club space (on the third floor); 330,000 gsf of automobile sales, preparation, and repairs space (on the ground floor and in three cellar levels); 36,000 gsf of NYPD Mounted Unit facility, including stable and related space (on the ground floor); and 225 accessory parking spaces (on the second floor).

This section evaluates the potential air quality impacts for the Project Build Year of 2011. The air quality analysis includes an assessment of existing conditions based on monitored air quality, a mobile source analysis, a parking lot analysis, an HVAC analysis, an analysis of odors from the proposed NYPD stables, and a manufacturing survey.

B. STANDARDS AND CRITERIA

National Ambient Air Quality Standards

Ambient air is defined by the United States Environmental Protection Agency (USEPA) as that portion of the atmosphere, external from buildings, to which the general public has access. National Ambient Air Quality Standards (NAAQS) were promulgated by USEPA for the protection of public health and welfare, allowing for an adequate margin of safety. The USEPA has set NAAQS for six criteria pollutants. They consist of primary standards, established to protect public health with an adequate safety margin, and secondary standards, established to protect "plants and animals and to prevent economic damage." The six major pollutants, deemed criteria pollutants, because threshold criteria can be established for determining adverse effects on human health are described below:

- Carbon Monoxide (CO). CO is a colorless, odorless gas produced from the incomplete combustion of gasoline and other fossil fuels. The primary source of CO in urban areas is from motor vehicles. Because this gas disperses quickly, CO concentrations can very greatly over relatively short distances.

- Inhalable Particulates also known as Respirable Particulates. Particulate matter is a generic term for a broad range of discrete liquid droplets or solid particles of various sizes. They are primarily generated by fuel oil combustion and by vehicular traffic that contributes to airborne particulates from brake and tire wear and the disturbance of dust on roadways. The PM_{10} standard covers particulates with diameters of 10 micrometers or less, which are the ones most likely to be inhaled into the lungs. The $PM_{2.5}$ standard covers particulates with diameters of 2.5 micrometers or less.

- Lead (Pb). Lead is a heavy metal. Emissions 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 a result, ambient concentrations of lead have declined significantly.

- Nitrogen dioxide (NO_2). Nitrogen dioxide is a highly oxidizing, extremely corrosive toxic gas. It is formed by chemical conversion from nitric oxide (NO), which is emitted primarily by industrial furnaces, power plants, and motor vehicles.

- Ozone (O_3). Ozone, a principal component of smog, is not emitted directly into the air but is formed through a series of chemical reactions between hydrocarbons and nitrogen oxides in the presence of sunlight.

- Sulfur dioxides (SO_2). Sulfur dioxides are heavy gases primarily associated with the Combustion of sulfur-containing fuels such as coal and oil. No significant quantities are emitted from mobile sources.

New York State Ambient Air Quality Standards further regulate concentrations of the criteria pollutants discussed above. The New York State Department of Environmental Conservation (NYSDEC), Air Resources Division, is responsible for air quality monitoring in the state. Monitoring is performed for each of the criteria pollutants to assess compliance. Table 15-1 shows the National and New York State Ambient Air Quality Standards.

Table 15-1
National and New York State Ambient Air Quality Standards

Pollutant	Averaging Period	Standard	2007 Value	Monitor
Sulfur Dioxide	12-month arithmetic mean 24-hour average 3-hour average	0.03 ppm 0.14 ppm 0.5 ppm	0.010 ppm 0.030 ppm 0.058 ppm	PS 59 Manhattan
Inhalable Particulates (PM10)	24-hour average	150 ug/m^3	57 ug/m^3	PS 59 Manhattan
Inhalable Particulates (PM2.5)	3-yr average annual mean Maximum 24-hr. 3-yr. avg.[d]	15 ug/m^3 35 ug/m^3	15.9 ug/m^3 52.8 ug/m^3	PS 59 Manhattan
Carbon Monoxide	8-hour average[a] 1-hour average[a]	9 ppm 35 ppm	1.5 ug/m^3 2.5 ppm	PS 59 Manhattan
Ozone	Maximum daily 1-hr avg.[b] Maximum daily 8-hr avg.[c] Maximum daily 8-hr avg.[e]	NA 0.08 ppm 0.075 ppm	NA 0.076 ppm NA	IS 52 Bronx
Nitrogen Dioxide	12-month arithmetic mean	0.053 ppm	0.034 ppm	PS 59 Manhattan
Lead	Quarterly mean	1.5 ug/m^3	0.02 ug/m^3	JHS 126 Brooklyn

Notes: ppm = parts per million; ug/m^3 = micrograms per cubic meter
a Not to be exceeded more than once a year.
b Applies only to areas designated non-attainment. The NYC metropolitan area is no longer subject to the 1-hour ozone requirement.
c Three-year average of the annual fourth highest maximum 8-hour average concentration. This 1997 standard will remain in effect for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
d Not to be exceeded by the 98th percentile of 24-hour PM2.5 concentrations in a year (averaged over 3 years).
e Three-year average of the annual fourth highest maximum 8-hour average concentration effective May 27, 2008
Sources: *New York State Department of Environmental Conservation; New York State Ambient Air Quality Development Report, 2007*

NYC De Minimis Criteria

For carbon monoxide from mobile sources, the City's de minimis criteria are used to determine the significance of the incremental increases in CO concentrations that would result from a proposed action. These set the minimum change in an 8-hour average carbon monoxide concentration that would constitute a significant environmental impact. According to these criteria, significant impacts are defined as follows:

- An increase of 0.5 parts per million (ppm) or more in the maximum 8-hour average carbon monoxide concentration at a location where the predicted No Action 8-hour concentration is equal to or above 8 ppm.

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

For $PM_{2.5}$, analyses at the microscale level, the City's de minimis criteria for determining significance are:

2.0 ug/m^3 for the 24-hour period, and
0.3 ug/m^3 for the annual period.

At the neighborhood scale of analysis, for mobile and stationary sources combined, the average PM2.5 concentration within a 1 km-square grid centered on the worst-case receptor has a de minimis value of:

0.1 ug/m^3 for the annual period.

No de minimis values have been assigned to PM10.

State Implementation Plan (SIP)

The Clean Air Act requires states to submit to the U.S. Environmental Protection Agency (EPA) a SIP for attainment of the NAAQS. The 1977 and 1990 amendments required comprehensive plan revisions for areas where one or more of the standards have yet to be attained. New York County is part of a CO maintenance area and is nonattainment (moderate) for the 8-hour ozone standard and nonattainment for PM10 and PM2.5. The state is under mandate to develop SIPs to address ozone, carbon monoxide, and PM10. It is also working with the EPA to formulate standard practices for regional haze and PM2.5.

C. PRELIMINARY SCREENING FOR POTENTIAL IMPACTS

Mobile Source Screen

To assess the potential for vehicular traffic to cause an air quality impact, a preliminary evaluation of intersections was carried out for CO and PM2.5.

CO Screen. Based on the NYC *CEQR Technical Manual* and subsequent revisions to its procedures, actions resulting in 75 or more trips through an intersection for this area of the City may require further analysis. The future traffic volumes are shown in Table 15-2, and the intersections for which traffic volumes were projected are shown in Figure 15-1. Multiple intersections and traffic periods would result in project-generated volumes above 75 vehicles. The Weekday PM period shows a maximum project increment of 99 vehicles at the intersection of W. 53rd Street and Tenth Avenue. The weekday AM period has a similar number of vehicles, 97, at this intersection and also has 82 vehicles at 11th Avenue and 54th Street. As a worst case, these two intersections are therefore recommended for modeling with MOBILE6.2 and CAL3QHC. If modeling with CAL3QHC shows no exceedances of the NAAQS or the NYC de minimis values at these worst-case intersections, then no exceedances would be expected at the remaining intersections. In summary, CO modeling is recommended for the peak AM period for:

- 11th Avenue at W. 53rd Street, and
- 11th Avenue at W. 54th Street

Table 15-2
Traffic Volume CO Screening Analysis

Intersection	No Action	Action	Project Generated
AM			
10th Ave. @ W. 52nd St.	2,739	2,783	44
10th Ave. @ W. 53rd St.	2,522	2,585	63
10th Ave. @ W. 54th St.	2,583	2,612	29
10th Ave. @ W. 55th St.	2,590	2,600	10
10th Ave. @ W. 56th St.	2,614	2,624	10
10th Ave. @ W. 57th St.	3,354	3,555	21
11th Ave. @ W. 51st St.	1,986	2,041	55
11th Ave. @ W. 52nd St.	2,411	2,490	79
11th Ave. @ W. 53rd St.	**1,952**	**2,049**	**97**
11th Ave. @ W. 54th St.	2,172	2,254	82
11th Ave. @ W. 55th St.	2,340	2,375	35
11th Ave. @ W. 56th St.	2,452	2,483	31
11th Ave. @ W. 57th St.	3,552	3,583	31
12th Ave. @ W. 52nd St.	7,308	7,332	24
12th Ave. @ W. 54th St.	7,126	7,158	32
12th Ave. @ W. 55th St.	7,770	7,794	24
12th Ave. @ W. 56th St.	8,233	8,257	24
12th Ave. @ W. 57th St.	9,147	9,171	24
MD			
10th Ave. @ W. 52nd St.	2,368	2,407	39
10th Ave. @ W. 53rd St.	**2,265**	**2,320**	**55**
10th Ave. @ W. 54th St.	2,238	2,263	25
10th Ave. @ W. 55th St.	2,257	2,266	9
10th Ave. @ W. 56th St.	2,214	2,222	8
10th Ave. @ W. 57th St.	2,856	2,873	17
11th Ave. @ W. 51st St.	1,785	1,830	45
11th Ave. @ W. 52nd St.	**2,019**	**2,085**	**66**
11th Ave. @ W. 53rd St.	**1,681**	**1,756**	**75**
11th Ave. @ W. 54th St.	1,784	1,839	55
11th Ave. @ W. 55th St.	1,969	1,997	28
11th Ave. @ W. 56th St.	2,007	2,031	24
11th Ave. @ W. 57th St.	2,845	2,869	24
12th Ave. @ W. 52nd St.	6,042	6,060	18
12th Ave. @ W. 54th St.	5,791	5,811	20
12th Ave. @ W. 55th St.	6,155	6,171	16
12th Ave. @ W. 56th St.	6,418	6,435	17
12th Ave. @ W. 57th St.	7,116	7,134	18
PM			
10th Ave. @ W. 52nd St.	2,627	2,678	51
10th Ave. @ W. 53rd St.	**2,649**	**2,706**	**57**
10th Ave. @ W. 54th St.	2,601	2,633	32
10th Ave. @ W. 55th St.	2,807	2,822	15
10th Ave. @ W. 56th St.	2,603	2,615	12

Intersection	No Action	Action	Project Generated
10th Ave. @ W. 57th St.	3,730	3,752	22
11th Ave. @ W. 51st St.	1,780	1,837	57
11th Ave. @ W. 52nd St.	1,969	2,057	88
11th Ave. @ W. 53rd St.	**7,765**	**1,864**	**99**
11th Ave. @ W. 54th St.	2,005	2,064	59
11th Ave. @ W. 55th St.	2,413	2,445	33
11th Ave. @ W. 56th St.	2,324	2,352	28
11th Ave. @ W. 57th St.	3,568	3,596	28
12th Ave. @ W. 52nd St.	6,976	7,003	27
12th Ave. @ W. 54th St.	6,912	6,937	25
12th Ave. @ W. 55th St.	7,485	7,514	29
12th Ave. @ W. 56th St.	7,627	7,656	29
12th Ave. @ W. 57th St.	8,696	8,725	29
SAT MD			
10th Ave. @ W. 52nd St.	2,370	2,412	42
10th Ave. @ W. 53rd St.	2,410	2,468	58
10th Ave. @ W. 54th St.	2,281	2,307	26
10th Ave. @ W. 55th St.	2,153	2,161	8
10th Ave. @ W. 56th St.	2,288	2,296	8
10th Ave. @ W. 57th St.	2,840	2,857	17
11th Ave. @ W. 51st St.	1,763	1,811	48
11th Ave. @ W. 52nd St.	1,886	1,958	72
11th Ave. @ W. 53rd St.	**1,732**	**1,810**	**78**
11th Ave. @ W. 54th St.	1,880	1,936	56
11th Ave. @ W. 55th St.	1,997	2,025	28
11th Ave. @ W. 56th St.	2,160	2,185	24
11th Ave. @ W. 57th St.	2,633	2,657	24
12th Ave. @ W. 52nd St.	5,972	5,994	22
12th Ave. @ W. 54th St.	5,965	5,988	23
12th Ave. @ W. 55th St.	6,333	6,353	20
12th Ave. @ W. 56th St.	6,631	6,652	21
12th Ave. @ W. 57th St.	7,285	7,307	22

Note: Entries in bold type exceed 75-vehicle threshold screen
Source: Philip Habib & Associates, January 2008

As discussed in Chapter 13, "Traffic and Parking," between the DEIS and the FEIS the baseline existing and No-Build traffic network volumes were updated to provide uniformity among the traffic analyses prepared for other projects located in this area of the City that are undergoing environmental review. Consequently, these changes to baseline traffic conditions would not materially affect the results of mobile source modeling presented in this chapter. As discussed below under "Future With the Proposed Action," both under No-Build conditions and with the proposed action the total 8-hour CO concentration would be 3.7 ppm and 3.9 ppm at the W. 53rd Street/Eleventh Avenue and W. 54th St./Eleventh Avenue analysis locations, respectively. The adjustments to baseline traffic volumes for the FEIS would only slightly increase values, however the results would remain well below the NAAQS of 9 ppm used in determining a significant adverse impact.

PM2.5 screen. NYCDEP has developed a screening analysis for potential $PM_{2.5}$ impacts based on exhaust emissions from heavy duty diesel-powered vehicles for 2008. A more detailed analysis is required if the proposed action would add emissions from trucks or mixed traffic that would be equivalent to the 2008 emissions from the volumes of heavy duty diesel vehicles (HDDV) listed below.

- 12 HDDV for paved roads with <5,000 vehicles/day,
- 19 HDDV for collector-type roads,
- 23 HDDV for principal and minor arterial roads, and
- 23 HDDV for expressways and limited-access roads.

The MOBILE6.2 emissions model was run for $PM_{2.5}$ to determine the site-generated vehicular emissions for 2011. Eleventh Avenue is an arterial and 53rd Street and 54th Streets are collector roads. A composite emission factor was calculated for a mix of 76% autos and 24% SUVs. As mentioned previously, the highest site-generated volume is 99 vehicles through the 11th Avenue/53rd Street intersection, which occurs during the PM peak. Table 15-3 shows that the composite emission factor for one auto/SUV, 0.0116 g/mi., would generate emissions of 1.1508 g/mi. for 99 vehicles in 2011. For 2008, the exhaust emission factor for $PM_{2.5}$ for heavy duty diesel vehicles (HDDV) would be 0.2245 g/mi. Therefore, 23 heavy duty diesel vehicles in 2008 would generate 5.164 g/mi. and 19 heavy duty diesel vehicles would generate 4.266 g/mi. These projected truck emissions are greater than the emissions of 1.1508 g/mi. calculated for 99 project-generated vehicles. Therefore, no $PM_{2.5}$ modeling is required.

Table 15-3
PM2.5 Screening Analysis

MOBILE6.2 Emission Factors (g/mi.)				Total Emissions (g/mi.) by Vehicle Volume			
				Trucks			Autos/SUVs
Year	Vehicle Type	Exhaust PM2.5	Relative Mix (%)	12	19	23	99
2011	LDGV	0.0116	76.0%				
2011	LDGT1	0.0117	24.0%				
2011	Composite	0.0116	100.0%				**1.1508**
2008	HDDV	0.2245		**2.694**	**4.266**	**5.164**	
Difference (truck - auto emissions)				**1.543**	**3.115**	**4.013**	

Source: Sandstone Environmental Associates, Inc.

D. EXISTING CONDITIONS

As shown in Table 15-1, air quality is within the NAAQS for all pollutants. However, previous ozone concentrations have exceeded the standards, and 3-year averages for PM2.5 have exceeded the former standard. Therefore, the site is within an area classified as nonattainment for both ozone and PM2.5. As stated previously, the site falls within a CO maintenance area.

E. FUTURE WITHOUT THE PROPOSED ACTION

Verizon vacated the site in 2007. To facilitate future reuse of the project site, the applicant proceeded with as-of-right excavation in 2007 that continued into 2008 followed by as-of-right foundation work.

Under as-of-right conditions with the site's existing M1-5 (Special Clinton District) zoning, light manufacturing and most commercial uses are as-of-right with a maximum permitted FAR of 5.0 and certain community facility uses are as-of-right with a maximum permitted FAR of 6.5. Although the site could be redeveloped with such uses, the analysis conservatively assumes that the future without the proposed action would not include new uses or buildings on the project site.

Mobile Sources

Traffic volumes were obtained from the traffic analysis, which includes volumes, by approach, for key links and intersections within the study area. Vehicular speeds, also obtained from the traffic study, were based on field observations.

The vehicular mix used for the analysis was based on field classification counts obtained from the traffic study. Vehicular mix represents the proportions of vehicles falling into the 28 MOBILE6.2 categories. Based on NYCDEP guidelines, taxis and sport utility vehicles are treated as special categories of vehicles. Sport utility vehicles (SUVs), which represent about 24 percent of the passenger vehicles, were included with light duty gasoline trucks in the LDGT1 category. Taxis are counted as a category separate from autos.

The mixture of vehicular types is used to obtain composite emission factors from MOBILE6.2. For this project, review of traffic data indicated that three vehicular mixes would be appropriate to characterize the roadway links on Eleventh Avenue, W. 54th Street, and W. 53rd Street.

CO emission factors for 2011 were obtained from EPA's MOBILE6.2 model. The ambient temperature used in the model was 50^{o} F, as recommended by the NYCDEP. Inputs pertaining to inspection/maintenance, anti-tampering programs, etc., were obtained from NYCDEP's most recent (March 2008) guidelines. The resulting MOBILE6.2 emission factors for each vehicular type were multiplied by the percentages for each vehicular mix to calculate the composite emission factors, by speed, for use in the CAL3QHC model.

CAL3QHC was used to determine CO concentrations. CAL3QHC is a Gaussian dispersion model that determines pollutant concentrations at specified receptor points. It accounts for CO from both free-flowing vehicles and vehicles idling at signalized intersections. Inputs to the model include Cartesian coordinates for receptors, free-flow approach and departure links, and the approach links for queued vehicles at intersections. Peak hour traffic volumes, signal cycle information, composite vehicular emission factors, and adjusted saturation flow rate are also input to the model.

Free-flowing traffic links are set up separately from intersection queue links. Free-flow links were modeled for a distance for 1,000 feet from the intersection in each direction. The mixing zone for free-flow links was equal to the width of the traveled way plus an additional 10 feet (3 meters) on each side of the roadway. For queue links, the mixing zone was limited to the width of the traveled way. CAL3QHC calculates the length of the queue links.

Sensitive receptors are homes, parks, schools, or other land uses where people congregate and which would be sensitive to air quality impacts. For the purposes of the air quality analysis, any point to which the public has continuous access can be deemed a sensitive receptor site. Numerous receptor points are typically modeled at each intersection to identify the points of maximum potential CO concentration. To analyze CO levels, receptor points were modeled on the corners of the intersections, and additional points were modeled at 20-foot intervals for a distance of 100 feet along both sides of each intersection leg. Receptors were placed at mid-sidewalk and outside the air quality mixing zone.

Typical worst-case meteorological conditions were used with CAL3QHC. These included a mixing layer height of 1,000 meters, a wind speed of 1 meter per second, and an atmospheric stability class of D (neutral stability). Settling and deposition velocities were assumed to be 0. Each computer run covered wind angles form 0 to 360 degrees and identified the worst-case wind angle for each receptor point. A surface roughness of 400 cm, representing central business district land uses, was used in the modeling.

To obtain 8-hour concentrations, the modeled CO values were multiplied by a persistence factor of 0.77, then added to the 8-hour background values to determine total CO concentrations during that period. The same worst-case wind angle would apply to both the 1-hour and 8-hour averaging periods. Only the 8-hour CO and background values are presented in the report. If no violation of the 8-hour standard occurs, no violation of the 1-hour CO standard is likely.

Mobile source modeling of CO concentrations accounts solely for emissions from vehicles modeled streets, but not for overall pollutant levels. Therefore, background CO concentrations must be added to modeling results to obtain total CO concentrations at a given receptor site. The background 8-hour CO level recommended by NYCDEP for the midtown Manhattan for 2011 is 2.9 ppm.

Table 15-4 shows the results of the CO modeling for 2011 No Action Conditions for the modeled intersections. Only the worst case receptor point is shown in the table. For W.53rd Street and Eleventh Avenue, this highest receptor location would be 40 feet east of the northwest corner of Eleventh Avenue and W. 53rd Street. The modeled 1-hour concentration of 1.1 ppm is equivalent to an 8-hour concentration of 0.8 ppm when the 0.77 persistence factor is applied. When added to the background value of 2.9 ppm, the worst-case CO concentration under No Action Conditions is 3.7 ppm. Based on the wind angle, the traffic on Eleventh Avenue and W. 53rd Street is the dominant contributor to the projected CO levels. The total CO concentration of 3.7 ppm is within the 8-hour CO NAAQS of 9 ppm.

For W.54th Street and Eleventh Avenue, the receptor would be 98 feet north of the northeast corner of Eleventh Avenue and W. 54th Street. The modeled 1-hour concentration of 1.3 ppm is equivalent to an 8-hour concentration of 1.0 ppm when the 0.77 persistence factor is applied. When added to the background value of 2.9 ppm, the worst-case CO concentration under No Action Conditions is 3.9 ppm. Based on the wind angle, the northbound and southbound traffic on Eleventh Avenue and the eastbound traffic on W. 54th Street is the dominant contributor to the projected CO levels. The total CO concentration of 3.9 ppm is within the 8-hour CO NAAQS of 9 ppm.

Table 15-4
No-Action 8-Hour Mobile Source CO (ppm)

2011 No Action Conditions	
Receptor: 22, 40 feet east of the northwest corner of W. 53rd Street and 11th Avenue	
Wind angle	231
Modeled CO	0.8
Background CO	2.9
Total CO	3.7
Receptor: 102, 98 feet north of the northeast corner of W.54th Street and 11th Avenue	
Wind angle	178
Modeled CO	1.0
Background CO	2.9
Total CO	3.9

Source: Sandstone Environmental Associates, Inc.

Parking Facilities

Under the No Action scenario, no parking facilities would be present on-site.

Stationary Sources

The site is currently undergoing as-of-right foundation preparation. Although the site could be developed with light manufacturing and commercial uses, the analysis conservatively assumes that no new development of the site would occur in the absence of the proposed action.

F. FUTURE WITH THE PROPOSED ACTION

The proposed action would facilitate approximately 1.3 million gross square feet (gsf) of mixed-use development in a uniquely-shaped building. Figure 1-5 in Chapter 1 shows a site plan of the building and Figure 1-8 in the same chapter shows a rendering of the building from different viewpoints. It would extend to the property line on all sides for the first two levels. The three cellar levels and the first two levels above grade would feature commercial

and accessory uses that would include an auto dealership, a parking deck, retail uses, a food market, and stables for the NYC Mounted Police.

Starting at the third level, the upper floors of the building would be constructed in an S-shape with the top and bottom of the S along the eastern and western boundaries and the diagonal portion of the S running from the southeast corner of the property on W. 53rd Street to the northwest corner on 11th Avenue and W. 54th Street. The highest section of the building would be 348 feet at the southeast corner on W. 53rd Street, after which it would decrease, in a series of terraces, to 318 feet at the northeast corner, 126 feet at the southwest corner, and 106 feet at the northwest corner (11th Avenue and W. 54th Street). A substantial portion of the roof over the second level (the mezzanine) that is not covered by the S-shaped construction would be landscaped and designed as an outdoor sitting area.

Mobile Sources

Modeling for Action Conditions followed the same procedures that were described under No Action Conditions. Table 15-5 shows the CO concentrations for 2011 Action Conditions. The worst case CO concentration at W.53rd St and 11th Avenue is 1.1 ppm for the one-hour period or 0.8 ppm for the 8-hour period. The total CO concentration of 3.7 ppm is within the NAAQS of 9 ppm for the 8-hour period. No exceedances of the NYC de minimis values would occur.

For W.54th Street and 11th Avenue, the worst case CO concentration is 1.3 ppm for the one-hour period or 1.0 ppm for the 8-hour period. The total CO concentration of 3.9 ppm is within the NAAQS of 9 ppm for the 8-hour period. No exceedances of the NYC de minimis values would occur.

Table 15-5
Eight-Hour Mobile Source CO Concentrations (ppm), Action Conditions

2011 No Action Conditions		**2011 Action Conditions**		**Difference (Action-No Action)**
Receptor: 22, 40 feet west of the northwest corner of W. 53rd Street and 11th Avenue		Receptor: 22, 40 feet west of the northwest corner of W. 53rd Street and 11th Avenue		
Wind angle	231	Wind angle	230	
Modeled CO	0.8	Modeled CO	0.8	0.0
Background CO	2.9	Background CO	2.9	
Total CO	3.7	Total CO	3.7	0.0
Receptor: 102, 98 feet north of the northeast corner of W.54th Street and 11th Avenue		Receptor: 102, 98 feet north of the northeast corner of W.54th Street and 11th Avenue.		
Wind angle	178	Wind angle	178	
Modeled CO	1.0	Modeled CO	1.0	0.0
Background CO	2.9	Background CO	2.9	
Total CO	3.9	Total CO	3.9	0.0

Source: Sandstone Environmental Associates, Inc.

Parking Facilities

Under the proposed action, the building would have a mezzanine-level parking area and a below-grade garage. The parking analysis was based on the guidelines provided in the NYC *CEQR Manual Technical Appendices*. Per guidance from NYCDEP, a persistence factor of 0.77 was used to convert 1-hour CO values to 8-hour CO values. EPA's MOBILE6.2 emissions model was used to obtain emission factors for hot (entering) and cold (exiting) vehicles as well as idling vehicles. Based on field data from other projects, passenger vehicles were divided into 76% autos and 24% SUVs for the purposes of obtaining a composite emission factor. Exiting vehicles were assumed to idle for one minute before departing, and speeds within the facility were 5 mph. As stated previously, the 8-hour background value for 2011 recommended by NYCDEP for Manhattan is 2.9 ppm. A background value of 2.9 ppm was added to the concentrations calculated for the parking facilities. For ground-level receptors, the mobile source contribution from the intersection of W. 53rd Street and Eleventh Avenue also was added. Table 15-5 shows he hourly parking demand.

Parking Deck. Figures 15-2 and 15-3 show the floor plan for the mezzanine parking level and Figure 15-4 shows the view from the south side of the building. The mezzanine parking level would be 30 feet above the sidewalk. It would have approximately 96,414 gsf and would serve 225 vehicles. As shown in Table 15-6, the peak use for the vehicles entering the mezzanine would be during the Weekday PM period, when 39 vehicles would arrive. The worst case for exiting vehicles, 46, would occur in the peak AM. As a worst-case analysis, this total of 85 vehicles was assumed to occur within one hour. The parking area would be naturally ventilated on three sides and would cover most of the building area on that level. As a worst case analysis, and because it has only one level, it was treated as a parking lot rather than a deck. However, the ramp distance was added to the average vehicular travel distance. Receptor points were placed six feet from the end of the lot and six feet from the width of the lot. No sidewalk receptors were included due to the deck's elevation of 30 feet above the sidewalk.

Table 15-6
Parking Facility Volumes, Action Conditions

Time Period	Accessory Mezzanine Deck Parking (W. 53rd Street)			Dealership (W. 53rd & W. 54th Street)		
	In	**Out**	**Total**	**In**	**Out**	**Total**
12-1 am	1	1	2	0	0	0
1-2	1	1	2	0	0	0
2-3	1	1	2	0	0	0
3-4	1	1	2	0	0	0
4-5	1	1	2	0	0	0
5-6	2	5	7	0	0	0
6-7	4	13	17	0	0	0
7-8	23	19	42	27	9	36
8-9	26	**46**	72	**36**	17	53
9-10	26	19	45	29	11	40
10-11	19	19	38	15	7	22
11-12 pm	20	18	38	13	9	22
12-1	28	28	56	27	27	54
1-2	21	21	42	13	14	27
2-3	24	21	45	19	14	33
3-4	27	17	44	13	9	22
4-5	34	31	65	15	29	44
5-6	**39**	36	75	6	**34**	40
6-7	33	33	66	7	31	38
7-8	28	28	56	3	12	15
8-9	19	19	38	0	0	0
9-10	4	6	10	0	0	0
10-11	3	2	5	0	0	0
11-12 am	2	1	3	0	0	0
Total	**387**	**387**	**774**	**223**	**223**	**446**

Note: Numbers in bold type indicate highest volumes
Source: Philip Habib & Associates, 2008

Table 15-7 shows the CO calculations for the mezzanine. The 8-hour worst case concentrations are 0.045 ppm for a receptor at the end of the mezzanine and 0.027 ppm for a receptor on the side of the facility. These totals were added to the background value of 2.9 ppm. No CO contribution from line sources was included because the mezzanine is 30 feet above the roadway. Total CO concentrations for both receptors in the vicinity of the mezzanine would therefore be 2.9 ppm, as shown in Table 15-7. These values are below the NAAQS of 9 ppm and the NYCDEP de minimis criteria.

Table 15-7
CO from Mezzanine Parking

Data	
2011 Mobile6 Emissions	
Cold idle (g/hr) @ 2.5 x 2.5 mph	85.5
Cold 5 mph	24.6
Hot 5 mph	14.0
8-Hour persistence factor	0.77
Empirical constant a	0.50
Empirical constant b	0.77
Parking Area Data	
Total sq. ft.	96,414
Average lot area (m)	8,957
Average length (ft)	470
Average width (ft)	200
Ramp (ft)	150
Avg. travel distance (ft.)	597
Peak 1-hour trips	
In	39
Out	46
Total	85
Constants	
Empirical constant a	0.50
Empirical constant b	0.77
Wind speed (meters/sec.)	1

1-Hour Trips			Lot Size	Mean Travel	Peak 1-Hour	Peak 1-Hour	Qa 1-Hour	Qa 1-Hour
Period	Ins	Outs	Sq. Ft.	Dist. (ft)	ER(r1)	ER(r2)	CO(r1)	CO(r2)
PM	39	46	96,414	597	0.071	0.071	0.000008	0.000008

	R1 End 1-Hour	R Side 1-Hour
ru=xu+xo, effective distance from rcv to upwind edge of lot (m)	165.0	82.7
rd=xd+xo, effective distance from rcv to downwind edge of lot (m)	21.7	21.7
xu, measured distance from rcv to upwind edge of lot (m)	145.1	62.8
xd, measured distance from rcv to downwind edge of lot (m)	1.8	1.8
xo, virtual distance used for initial vertical mixing of CO (m)	19.9	19.9
Distance to Receiver (ft)	6	6
Distance to Receiver (m)	1.8	1.8
CO conc., gm/m3=Xu=0.8/a*(1-b)*(ru^(1-b)-rd^(1-b))*Qa*PF	0.00007	0.00004
CO concentration, ppm	0.058	0.035

	8-Hour	8-Hour
Mezzanine concentration	0.04	0.03
Garage below	0.18	0.18
Background	2.9	2.9
Total (ppm)	3.13	3.11

Garage. As was shown in Figure 15-4, the auto dealership garage would have three levels. The square footage would be 276,184 gsf. It would be mechanically ventilated on the W. 53rd Street side of the building with four louvers, each of which would be about 6 feet high by 2 feet wide. Shown in Figure 15-5, they would be 17.8 feet above ground level. However, as a worst-case assumption, the analysis was carried out as if the CO would be vented from a single vent. As was shown in Table 15-6, the worst-case volumes for the garage would be an arrival of 36 vehicles and a departure of 34 vehicles (70 total vehicles). An average ramp distance of 222 feet was added to the average vehicular travel distance. Receptor points were placed at the near sidewalk, the far sidewalk (55 feet away), the nearest receptor point above the garage exhaust, and a window across the street at the same elevation as the louvers (60 feet away). The nearest receptor point above the garage exhaust would be a pedestrian on the south side of the mezzanine parking deck, which is 30 feet above the street.

Table 15-8 shows the calculations for the service garage for the auto dealership. The total worst case 8-hour concentration is 0.25 ppm for a pedestrian on the sidewalk below the exhaust point. The totals for each receptor were added to the background value of 2.9 ppm and the worst case modeled concentration of 1.0 ppm for the intersection of Tenth Avenue and W. 53rd Street. Total CO concentrations for the receptors would therefore range from 4.05 ppm to 4.17 ppm, as shown in Table 15-8. These values are below the NAAQS of 9 ppm and the NYCDEP de minimis criteria.

Table 15-8
CO from Auto Dealership Garage

2011 Mobile6.2 Emissions	
Cold idle (g/hr) @ 2.5 x 2.5 mph	85.5
Cold 5 mph	24.6
Hot 5 mph	14.0
Garage Levels	**All**
Total sq. ft. (unobstructed)	276,184
Average sq. ft./level	92,061
Average length (ft)	200
Average width (ft)	470
Avg. travel @ 2/3 (L + W) (ft)	447
Avg. total ramp distance (ft.)	222
Total travel distance (ft.)	669
Peak 1-Hour Trips	
Ins	36
Outs	34
Total	70
Total Garage Emissions	
Peak 1-hour emission rate (ER)	0.061
Maximum 1-hour CO	0.41
Garage Vents	
No. of vents	1
Vent elevation (ft)	14.0
Vent elevation (meters)	4.3

Receptor Data	
Adjacent sidewalk, dist.(ft)	6.0
Adjacent sidewalk, dist. (m)	1.8
Adjacent sidewalk, height (ft)	6.0
Adjacent sidewalk, height (m)	1.8
Far sidewalk, dist.(ft)	55.0
Far sidewalk, dist. (m)	16.8
Far sidewalk, height (ft)	6.0
Far sidewalk, height (m)	1.8
Window across street, dist.(ft)	60.0
Window across street, dist. (m)	18.3
Window across street, height (ft)	14.0
Window across street, height (m)	4.3
Pedestrian above vent, dist.(ft)	0.0
Pedestrian above vent, dist. (m)	0.0
Pedestrian above vent, height (ft)	36.0
Pedestrian above vent, height (m)	11.0

Worst-Case CO Concentrations				
Variable	**Pedestrian Above**	**Near Sidewalk**	**Far Sidewalk**	**Window Across**
H (meters)	(6.7)	2.4	2.4	-
Q/vent	0.061	0.061	0.061	0.061
CO (g/m^3)	0.0005	0.0005	0.0005	0.0005
$1/o_y^2$	0.0241	0.0241	0.0241	0.0241
o_y	6.44	6.44	6.44	6.44
o_y (dist)	6.44	6.73	9.12	9.37
o_z (dist)	6.44	6.70	8.79	9.00
1-Hour CO g/m^3	0.000272	0.00040	0.00023	0.00023
1-Hour CO ppm	**0.24**	**0.35**	**0.20**	**0.20**
8-Hour persistence factor	0.77	0.77	0.77	0.77
8-Hour CO (ppm) from garage	**0.18**	**0.27**	**0.16**	**0.15**
Total CO Concentrations				
8-Hour background value (ppm)	2.90	2.90	2.90	2.90
Total 8-hour garage CO and background	**3.08**	**3.17**	**3.06**	**3.05**
CO from passing traffic (ppm)	1.0	1.0	1.0	1.0
Total 8-hour CO (ppm)	**4.08**	**4.17**	**4.06**	**4.05**

Source: Sandstone Environmental Associates, Inc.

Heating, Ventilating, and Air Conditioning (HVAC), Proposed Action

The proposed action would use natural gas for heating and hot water. Therefore, NOx is the pollutant of interest. Impacts were evaluated for the exhaust from the boilers used for heating commercial and common areas of the building, as well as for providing hot water to the tenants. Heating for the residential units would be provided by individual gas-fired units in each unit.

PTAC Units. Packaged terminal air conditioning (PTAC) units would be used to heat and cool the individual residential units. These would be through-the-wall units, about the size of an air conditioner, with a width of 42 inches and a height of 20 inches. They would use electricity for air conditioning and natural gas for heating. Gas pipes would be run through the walls to each unit, similar to the gas pipes used for kitchen ovens and burners. Figure 15-6 shows a typical unit.

Each living room and bedroom would have a PTAC unit. Thus, the number of units would range from one for a studio apartment to three for a 2-bedroom apartment. With 900 residential units planned, approximately 2,500 PTACs would be installed along the building's facades. In most instances, the PTACs would be located beneath an inoperable window, but some units would be below and to the side of an operable window. Horizontal distances between the PTACs would range from three to 10 feet.

Suburban and Islandaire are two major suppliers of PTAC units. Representatives of both firms were contacted regarding emissions of NOx. No information on NOx emissions is available. However, both representatives stated that they are not required to demonstrate compliance with any NOx standards.

To demonstrate that no impacts are likely, a preliminary AERMOD analysis was carried out. Emission factors for the units were based on 36.4 cubic feet natural gas per square foot of living space for a multifamily structure, as indicated in the *CEQR Technical Manual Appendices*. Although the sizes of the residential units vary slightly, typical square footages would be as follows:

- Studio 420 sq. ft.
- 1-Bedroom 650 sq. ft.
- 2-Bedroom 750 sq. ft.

These square footages were used to derive emission factors for PTAC emissions based on 2,400 hours per year of use for heating. The resulting emission rates were 0.00635 grams/second for all three types of residential units. This is a very conservative emission rate because: 1) the emission factor is based on 1993 information, and the PTAC units planned for use represent a more energy-efficient technology; 2) the emission rate is based on one unit serving the entire square footage of each dwelling unit instead of two or three units serving

smaller square footages for the living room and bedrooms; and 3) the units are modeled as if they were point sources from mini-boilers heating water for steam, which would require more fuel than the simpler combustion heating required for the PTAC.

The rows of windows would 10 feet apart vertically. Horizontal distances between windows vary from about 2.5 feet to 5 feet. Windows directly above the PTAC units would not be not operable as per building design. Therefore, no receptors were placed at these locations on the building. Thus, the nearest distance from an operable window to the exhaust vent on a PTAC unit would be at least three feet.

The AERMOD model was run for an operable window with a PTAC unit 10 feet above it, 10 feet below it, 3 feet east of it, and 3 feet west of it. This would be a worst-case configuration. Additional receptors were placed at 3-meter intervals to determine the location of the highest concentration. The resulting maximum annual concentration of NOx was 0.04 ug/m^3 at a distance of 13 feet from the source. This is a negligible concentration. When added to the NOx background concentration of 71 ug/m^3, the total concentration would be 71.04 ug/m^3, which is within the NAAQS of 100 ug/m^3. Although any given window would be subject to emissions from multiple PTAC units, the modeled concentrations are so low that the effects of multiple PTAC units at greater distances are unlikely to cause an exceedance of the NAAQS. For example, a very conservative assumption of 600 PTAC units, each contributing was 0.04 ug/m^3 to a given window, would result in a total concentration of 25 ug/m3. When added to 71 ug/m^3, the total of 96 ug/m^3 would still be within the NAAQS.

Building Boilers. The building will have boilers to heat the common areas, lobbies, gym, horse stables, and food market, which constitutes an area of approximately 115,365 sq. ft. A set of six gas-fired boilers, each having 3.0 million Btu/hour, would be located above the swimming pool on the second level on the east side of the building. Three exhaust flues for the boilers would be located on the east side of the building at the third level, approximately 58 feet above ground level, 14 feet east of the eastern property line, and 46 feet north of the southern property line. The flues would have diameters of 14 inches. Assuming the flues are three feet high, the exhaust emissions would occur about 61 feet above ground level. The boilers on the second level also will provide hot water (domestic load) to the residential units on the low and middle levels of the building, which is about 75% of the residential units. They would provide heating for 24 hours per day for 100 days (2,400 hours), but would provide hot water every day (8,760 hours per year).

Two more boilers would be in the mechanical space on the roof at a height of 342 feet, and they would be used only for hot water for the upper residential levels of the building, which would be about 25% of the residential units. Each boiler would have 3 million Btus, but only one at a time would be in use. The second boiler would be in reserve. The emissions would exhaust through two 8-inch diameter flues on the roof located 75 feet north of 53rd Street and 40 feet west of the eastern property line. Assuming the flues are 3 feet high, they would exhaust at a height of 345 feet.

Auto Dealership Boilers. The auto dealership includes a showroom with 56,000 sq. ft. on the ground floor and three cellar levels totaling 274,000 sq. ft. that would be used for servicing.

Four gas-fired condensing boilers in the second cellar level, each having 3.0 million Btu/hour, would provide heat for the auto dealership. These boilers would be used to heat the space occupied by the dealership and would run approximately 100 days per year for 24 hours per day (2,400 hours per year).

A flue for the boilers would be located on the east side of the building at the third level, approximately 58 feet above ground level and 46 feet from the southern property line. It would have a diameter of 22 inches and would be 17 feet from the eastern property line. Assuming the flue is three feet high, the exhaust emissions would occur 61 feet above ground level.

Boiler analysis. Figures 15-7, 15-7a and 15.7b show the locations of the flues for the HVAC boilers. Per guidance from the NYC *CEQR Technical Manual*, modeling parameters included a surface roughness of 321 centimeters, an exhaust velocity of 0.001 meters/second, and an exhaust temperature of 293^{o} K.

Emission factors for the flues were based on an annual consumption rate of 52.8 cubic feet of natural gas per square foot for a residential structure, as indicated in the *CEQR Technical Manual Appendices*. The annual consumption of natural gas, in cubic feet, was converted to pounds using a multiplier of 100 as recommended in Table 1.4-1 of EPA's AP-42 publication for external combustion sources. The results were converted to an emission rate in grams/second based on 2400 hours per year of use for heating, and 8760 hours of use for hot water. Based on information from the Energy Information Administration for natural gas consumption for non-mall buildings, the natural gas used for heating and hot water was split into 80% for heating and 20% for hot water. The resulting emission rates were divided proportionally among the flues for each set of boilers.

AERMOD was used to model the NOx concentrations from the flues for the three sets of boilers using the urban dispersion option. Meteorology data for LaGuardia Airport from 2002 through 2006 was used for the model runs. Receptor points relevant to the flues for the auto dealership and the lower part of the building were placed at the midpoint of the windows along the eastern façade at heights of 64 feet, 74 feet, and 84 feet. Receptor points also were placed along the property boundary with AT&T at a height of 64 feet, at a window across the street at a height of 64 feet, and at the sidewalk level. Additional tiers of receptors were placed: 1) 10 meters from the fence (property) line and 10 meters apart, 2) 20 meters from the fence line and 20 meters apart, and 3) 50 meters from the fence line, 50 meters apart.

Table 15-9 shows the concentrations from the boiler flues for each modeled year at the worst-case receptor point as well as the worst-case apartment window, which was the one closest to the boiler flue area at a height of 64 feet. The worst-case receptor point was on the roof of the AT&T building. The worst-case concentration occurred for the 2002 meteorology data. Adding the modeled value of 13.1 ug/m^3 to the background value of 71.0 ug/m^{3}results in a total of 84.1 ug/m^3. This is below the NAAQS of 100 ug/m3. Thus, no impacts from the building's HVAC exhaust are anticipated.

Table 15-9
Worst-Case NOx Concentrations
from HVAC Combustion

Year	Receptor Height (m)	Background Value (ug/m^3)	AT&T Roof		Apartment Window	
			Modeled (ug/m3)	Total (ug/m3)	Modeled (ug/m3)	Total (ug/m3)
2002	19.5	71	13.1	84.1	3.0	74.0
2003	19.5	71	10.8	81.8	3.0	74.0
2004	19.5	71	10.0	81.0	2.9	73.9
2005	19.5	71	9.4	80.4	2.8	73.8
2006	19.5	71	10.6	81.6	3.0	74.0

Note: Items in bold type indicate potential impact
Source: Sandstone Environmental Associates, Inc.

As noted on the project's site plan contained in the ULURP application (ULURP No. 080010/11 ZMS) (drawing Z-02 Site Plan), the building will use natural gas as the type of fuel for HVAC systems. This measure would ensure that no significant adverse air quality impacts would result from the proposed action.

Odors

No odors from existing land uses were observed during the field work. Therefore, the primary source of concern is the potential impact of the NYPD horse stables on the surrounding community and the future tenants of the building.

Ammonia (NH3) is the primary pollutant of concern from horse manure, and there is no ambient hourly air quality standard. For ammonia, 50 ppm is considered a strong odor, and OSHA has established a permissible worker exposure limit of 50 ppm over an 8-hour period. The American Conference of Governmental Industrial Hygienists (ACGIH) has established a short-term (15-minute) exposure limit of 35 ppm. The Agency for Toxic substances & Disease Registry (ATSDR), an agency of the U.S. Department of Health and Human Services, states that a concentration of 5 ppm is considered the threshold of detection. The NYS Department of Environmental Conservation has developed a short-term guideline concentration (SGC) of 2400 ug/m^3 and an annual guideline concentration (AGC) of 100 ug/m$_3$. Most of the guideline concentrations are based on potential health impacts rather than nuisance impacts. For the purposes of this study, the threshold detection level of 5 ppm will be used to determine community impacts.

The stables would be on the southern side of the building, and odors from the facility would exhaust approximately 19.7 feet high from four louvers on the southern side of the building that would be 6 feet high by 27 feet long (see Figure 15-5). AERMOD was used to model the louvers as volume sources. An ammonia emission rate of 8 kg per year per horse was used and converted to grams/second for use in the AERMOD model. Receptor points were placed at mid-sidewalk on the southern side of the subject site, in tiered grids that at distances of up to 50 meters around the site, and at three key locations. These locations are:

- A pedestrian 6 feet from the southern edge of the terrace above the mezzanine,

- A pedestrian at the site boundary,
- A pedestrian at mid-sidewalk on 53rd Street adjacent to the subject site, and
- The window of the residential building on W.53rd Street directly across from the louvers.

Table 15-10 shows the results of the modeling for the worst-case receptor points in each key location. The results were compared with the odor detection threshold of 5 ppm. As is evident from Table 15-10, the modeled values at the receptor sites are below this threshold value.

The AERMOD modeling does not account for the filters that would be used to minimize the potential for odors emissions to the outside. The proposed action includes a Merv 8 pre-filter followed by a carbon filter, then followed by a Merv 8 post filter. MERV, or *Minimum Efficiency Reporting Value*, is a ratings scale from 1 to 16 that is directly related to the efficiency of an air filter. The higher the MERV, the more efficient an air filter is at removing particles from the HVAC system. An example of a filter that may fit in the lower end of the efficiency spectrum is a fiberglass panel filter, which may have a MERV of 4 or 5. In demonstrating maximum efficiencies, a MERV 14 filter is typically chosen for critical areas of a hospital (to prevent any transfer of bacteria and infectious diseases). Higher MERV filters are also capable of removing higher quantities of extremely small contaminants (particles as small as 1/300 the diameter of a human hair) that would otherwise pass through a filter graded with a lower rating. If these contaminants or pollutants are the source of odor, then these filters also can reduce the human exposure to such smells. A higher MERV more effectively impedes airflow because the filter components become denser as efficiency increases. For the cleanest air, a user should select the highest MERV filter that their unit is capable of forcing air through based on the driving limit of the unit's fan power. (*Source: Clean Air Solutions, http://www.filterair.info/articles/article.cfm/ArticleID/7AF95A61-EAF8-4C90-BFA98EE04B0DD02B)*

Table 15-10
NH3 Concentrations from Horse Stables

Receptors				1-Hour Modeled Concentrations	
Location	**Height (ft)**	**Height(m)**	**Year**	**ug/m^3**	**ppm**
Terrace	51	15.5	2002	5.49	0.0079
	51	15.5	2003	4.70	0.0067
	51	15.5	2004	4.74	0.0068
	51	15.5	2005	4.76	0.0068
	51	15.5	2006	5.51	0.0079
Sidewalk	6	1.8	2002	7.06	0.0101
	6	1.8	2003	5.32	0.0076
	6	1.8	2004	4.87	0.0070
	6	1.8	2005	6.19	0.0089
	6	1.8	2006	4.25	0.0061
Windows across the street	22.5	6.86	2002	1.42	0.0020
	22.5	6.86	2003	1.40	0.0020
	22.5	6.86	2004	1.79	0.0026
	22.5	6.86	2005	1.58	0.0023
	22.5	6.86	2006	1.39	0.0020
Site boundary	6	1.8	2002	4.80	0.0069
	6	1.8	2003	4.08	0.0059
	6	1.8	2004	4.52	0.0065
	6	1.8	2005	5.60	0.0080
	6	1.8	2006	6.47	0.0093

Source: Sandstone Environmental Associates, Inc.

Survey of Surrounding Establishments with Air Quality Emissions

According to the *CEQR Technical Manual*, facilities with the potential to cause adverse air quality impacts are those that would require permitting under city, state and federal regulations. The Manual lists the following types of uses as a source of concern for the residential uses that would occur under the proposed action:

- large emission source (e.g., solid waste or medical waste incinerators, cogeneration facilities, asphalt and concrete plants, or power generating plants) within 1,000 feet,
- a medical, chemical, or research laboratory nearby,
- a manufacturing or processing facility within 400 feet, and
- an odor producing facility within 1,000 feet.

To identify facilities in the categories listed above, the manufacturing survey included on-line searches of NYSDEC's Air Permit Facilities Registry and EPA's Facility Registry System for permitted facilities, a field survey to identify unpermitted facilities or facilities that may have NYCDEP permits, an on-line search of data provided by the NYC Department of Buildings,

telephone directory listings, internet websites, NYSDEC's DAR-1 software, and a search for NYCDEP permits. Figure 15-8 shows the radii of 400 and 1,000 feet.[1]

Large emission sources would be identified in the listing of draft and issued Title V facilities found in the state and federal registries. No major air pollutant emitters with a Title V permit were identified within a 1,000-foot radius of the site. No state facility permits were identified within a 400-foot radius of the rezoning area boundaries. NYSDEC's DAR-1 software also was run to identify facilities with permits within 400 feet of the rezoning area boundaries. No additional information was provided by this program.

Boilers.

The properties discussed below were included in a search for boilers except for Con Edison, which is beyond the 1,000-foot radius from the proposed action.

AT&T, Inc. owns the building at. 789 10th Avenue, which is adjacent to the proposed action on the east. This building houses as a telephone exchange and maintenance facility, including an indoor cafeteria and locker room, as documented in the most recent CO (Dec. 27, 1965). No manufacturing purpose is listed, as it is classified as a commercial building. According to current boiler details retrieved from the NYC Department of Buildings website, status records indicate that all boilers are listed as void. Teledyne is the manufacturer of the boilers.

A search of posted work permits was conducted on the NYC Department of Buildings online database to determine any relevant boiler or fuel tank operations. One listed work permit (Permit No. 102052314-01-EW-OT) indicates that boilers were removed from the premises, along with all associated piping. No indication exists on the summary as to whether new boilers were installed under the same job. This permit was issued February 25, 1999.

No fuel combustion stacks are located on the roof of the AT&T building. Five sets of cooling towers, installed in 1999, are on the roof, and the warm air exhausted from the coolers condenses, creating a cloud of mist that evaporates within approximately 10 feet of the coolers.

Con Edison operates a plant facility on W. 59th Street and 11th Avenue, approximately 400 feet beyond the 1,000 foot border. This building was issued a Title V permit. The structure generates steam and electricity, which it then distributes into the city's grid system for utilities. The boilers used by the plant burn oil and have a future capacity to use natural gas. Because it is over 1,000 feet from the proposed action, this plant is not a source of concern.

501 W. 52nd Street is within a 400-foot radius of the proposed action. Two NYCDEP permits were found for 501 W. 52nd Street, which is included among the addresses for 771-777 10th Avenue. This building contains residential walk-up apartments with five floors above the ground-floor retail space. The permits were for oil-fired boilers with expiration dates of 1997

[1]Distances shown in Figure 15-8 are approximate. Actual distances were measured on available maps and the industrial uses that fell within them are discussed in the text.

and 2001. However, information found on the NYC Buildings website indicates that the building was renovated and converted to gas heating in 2002. No permits for gas-fired boilers were found.

609 W. 51st Street has an NYCDEP permit for a gas-fired boiler for the Piano Development Corp. Located near the corner of W. 51st Street and 12th Avenue, this seven-story building has space for offices and showrooms. Internet sources indicate that Piano Development is associated with Prada and that Prada clothing is sold on this site. The size of the building, 121,638 sq. ft., was used with Figure 3Q-10 from the *CEQR Technical Manual* to determine whether it could cause an adverse air quality impact to 770 11th Avenue. Based on Figure 3Q-10, the stack on an 84-foot high building of 121,638 sq. ft. heated by natural gas should be at least 50 feet from the nearest building of similar or greater height (see air quality appendix). The distance between 770 11th Avenue and 609 W. 51st Street exceeds this distance. Therefore, no significant adverse impacts are anticipated.

619 W. 54th Street has four NYCDEP permits for oil-fired boilers**.** Two are for boilers burning #6 oil and two are for boilers using natural gas. In this 10-story building, the first floor retail includes a Grainger outlet (a supplier of products to various companies), and office or residential uses are on the upper floors. The size of the building, 277,600 sq. ft., was used with Figure 3Q-4 from the *CEQR Technical Manual* for # 6 oil to determine whether it could cause an adverse air quality impact to 770 11th Avenue. Based on Figure 3Q-4, the stack on a 110-foot high building of 277,600 sq. ft. heated by #6 oil should be at least 145 feet from the nearest building of similar or greater height (see air quality appendix). The distance between 770 11th Avenue and 609 W. 51st Street exceeds this distance. Therefore, no significant adverse impacts are anticipated.

564 W. 52nd Street contains residential walk-up units above a first floor consumer retail outlet. There are four stories. No stacks or vents were observed. No NYCDEP permits were found.

525 W. 52nd Street is a 7-story building manufacturing and accessory offices. It has three boiler permits, one for 525 W. 52nd Street LLC and two for Apple Industrial Condo. The permit for 525 W. 52nd Street LLC appears to be a registration for a gas-fired boiler for hot water. According to online information for the NYC Department of Buildings, the two boilers for Apple Industrial Condos burn #4 oil and are both active. The size of the building, 253,045 sq. ft., was used with Figure 3Q-6 from the *CEQR Technical Manual* for # 4 oil to determine whether it could cause an adverse air quality impact to 770 11th Avenue. Based on Figure 3Q-6, a 122-foot high building (stack height of 125 feet) of 253,045 sq. ft. heated by #4 oil should be at least 110 feet from the nearest building of similar or greater height (see air quality appendix). The distance between 770 11th Avenue and the stack at 525 W. 52nd Street is approximately 200 feet, which exceeds the recommended minimum distance of 110 feet. Therefore, no significant adverse impacts are anticipated.

555 W. 52nd Street is the NYCHA Clinton Housing Development. Having a total of 8 stories, it spans half the length of the block starting at 11th Avenue heading to the east. No NYCDEP permits were found for this site.

779-783 10th Avenue is a corner building on W. 53rd Street with residential units and an underground parking garage on a side street. No NYCDEP permits were found for this site.

605 W. 51st Street is a 3-story building. The Financial Code of J9 indicates this structure is currently being used as a theatre. Judging from observations during the field survey, this structure may be used in conjunction with the current set of Comedy Central's *The Daily Show*, located at 733 11th Avenue. No vents or stacks were observed at this location. No NYCDEP permits were found for this site.

545 W. 53rd Street has a boiler permit. However, recent information indicates that this site, which is owned by the NYC Department of Housing and Preservation Development, is now vacant. Thus, the boiler permit is no longer applicable.

Air Toxics

On April 19, 2007, a field survey was carried out to identify manufacturing uses that have the potential to impact projected development. This includes sources with potential non-criteria emissions that may not have or may require necessary air permits. Criteria for identifying such operations during the field survey included:

- industrial buildings with stacks, vents, or observed emissions;
- establishments with names indicative of operations that could require permitting;
- establishments with the potential to cause unpleasant odors.

No medical, chemical, or research laboratories were identified within 400 feet of the proposed rezoning boundaries. No unpleasant odors were encountered during the field survey.

Based on SEA's field work and a supplemental list of addresses provided by NYCDEP, 6 sites of potential concern were identified within a 400-foot radius of the study area. The blocks, lots and addresses of these sites are listed in Table 15-11. They were also sent on to the NYCDEP to determine whether any of them had City permits. Information from the field surveys, as well as available maps, internet searches, and reverse directory lookups, was used in an effort to identify the uses present on these sites. Table 15-11 also shows the current uses of the sites.

TABLE 15-11
Industrial Sites Within 400-foot Radius of Rezoning Area

ID	Block	Lot	Address	Financial Code*	Current Use
1	1080	103	551 W. 51st St.	L9	Multiple Residences, Auto Repair Store
2	1080	25	505 W. 52nd St.	D9	Automotive Repair
3	1081	1	535 W. 52nd St.	D9	McKinney Welding Supply
4	1081	60	548 W. 53rd St.	V1	Vacant Land
5	1081	7501	523-525 W. 52nd St.	R0	Printing Establishment, Manufacturing and Accessory Offices
6	1099	36	735 11th Ave.	C5	Walk up Apartments, First Floor Retail

**Legend: C5 – Converted Dwellings or Rooming House; D9 – Elevator Apt., Misc.; R0 – Special Condominium Building Lot; V1 – Vacant Land*
Source: Sandstone Environmental Associates

1. 551 W. 51st Street. This property consists of residential units and is located adjacent to an auto repair shop near the southeast corner of 51st Street and 11th Avenue. The auto repair shop, Cybert Auto Care at 726 11th Avenue, specializes in providing New York State vehicle emissions inspections and is a state-certified repair shop. Currently the facility carries out body work, state emissions inspections, and routine tune-ups for motor vehicles. It apparently does not engage in body painting on-site and has no state air facility permit. No vents or stacks were apparent on either the shop or the residential building to the east. No NYCDEP permits were found for this site.

2. 505 W. 52nd Street. This is the current location of Dave's Collision Repairs II**.** No NYCDEP permits were found.

3. 535 W. 52nd Street. McKinney Welding Supply, Co., Inc. is located at this address. This establishment is a welding and gas supplier to the metropolitan area. Welding equipment, gas tanks, and various types of electrical equipment are sold. No major manufacturing occurs at this location. No NYCDEP permits were found.

4. 548 W. 53rd Street. An auto repair shop was previously observed at this location, but current information indicates that the lot is vacant. No NYCDEP operations permits were found.

5. 523-525 W. 52nd Street. Tanya Seybert Printing and United Envelope are located at this address. The building is eight stories high. According to a CO issued in 2007, the building has industrial condominiums and houses manufacturing and accessory office uses. NYCDEP has active operations permits for both Tanya Seybert and United Envelope. Therefore, further analysis using the Industrial Source Screen in the *CEQR Technical Manual* is recommended.

The site is shown in Figure 15-9. Although the building extends through the block from W. 52nd to W. 53rd Street, the addresses of the two printing establishments indicate they are on the W. 52nd side of the street, which would be about 200 feet from the proposed action.

6. 735 11th Avenue. This 4-story walk-up apartment building houses a retail establishment selling tile, marble countertops, etc., on the first level, and residential apartments above. No adverse uses were identified, and no NYCDEP permits were found.

Industrial Source Screen

To determine whether the emissions from the three industrial facilities could cause significant adverse impacts to the proposed action, an analysis using the Industrial Source Screen was carried out. The NYC *CEQR Technical Manual* provides a table showing pollutant concentrations (ug/m^3) at various distances resulting from a point source emitting 1 g/s of a generic pollutant. It assumes that all inputs represent worst-case conditions for stack temperature, exhaust velocity, and other variables. Both the receptor height and stack height are assumed to be 20 feet high, which is a conservative assumption because the stacks listed in the permits are higher. Table 15-12 shows the generic table from the *CEQR Technical Manual.* Most point sources emit pollutants at a lower rate than 1 g/s. Thus, the estimated emissions at each distance would be scaled downward accordingly. This method of analysis is the Industrial Source Screen. If the Industrial Source Screen shows no potential for exceeding the evaluation criteria, then no further analysis is required.

Table 15-12
Generic Pollutant Concentrations

Generic Pollutant Concentrations (1 g/s emission rate)				
Distance from Source (ft)	**Averaging Periods (ug/m3)**			
	1 Hour	**8-Hours**	**24 Hours**	**Annual**
30	151,114	52,690	22,850	2,196
65	38,130	13,290	5,751	551
100	17,103	5,959	2,573	246
130	9,708	3,381	1,458	140
165	6,269	2,183	942	91
200	4,392	1,530	664	66
230	3,258	1,135	499	51
265	2,524	880	392	41
300	2,028	707	319	34
330	1,681	587	267	29
365	1,431	499	228	25
400	1,245	434	199	21

Source: NYC CEQR Technical Manual

United Envelope emits particulates (CAS NY075-00-0) from a 64-foot high stack approximately 200 feet south of the site boundaries. This stack would be lower than the proposed residential buildings at 770 11th Avenue. As a conservative estimate, all PM emissions were categorized as PM10. Based on the permit information and the Industrial Source Screen, United Envelope would add 0.03 ug/m^3 to the 24-hour concentrations of PM10 at the nearest site boundary. Table 15-13 compares the 24-hour PM10 concentrations

from United Envelope with the NAAQS. The resulting total concentration of 63.03 ug/m^3 would be within the NAAQS.

Table 15-13
PM10 Concentrations (ug/m^3) @ 200'
Compared with National Ambient Air Quality Standards

Time Period	PM10 24-Hour Concentration (ug/m^3)
United Envelope	0.03
Background*	63.0
Total	63.03
NAAQS	150.0

**Background based on NYCDEP's February 13, 2008 memo using the Canal Street concentration as a worst case.*
Source: Sandstone Environmental Associates, Inc

Table 15-14 shows the results for non-criteria pollutants that are not compared to the NAAQs to determine impacts. Instead, they are compared with NYSDEC Annual Guidance Concentrations (AGCs), Short-Term Guidance Concentrations (SGCs) and other state standards. Concentrations for the non-criteria pollutants for both printing operations are shown in Table 15-14. Based on Table 15-14, all non-criteria pollutants that have a NYSDEC AGC and/or SGC standards are below the threshold values that would constitute an impact. Thus, no significant adverse impacts are anticipated from the printing operations.

Table 15-14
Non-Criteria Pollutant Concentrations (ug/m^3) @ 200'
Compared with NYSDEC Standards

Pollutant	CAS #	1-Hour Concen-tration	NYS SGCS	Annual Concen-tration	NYS AGCS
Particulates	NY07500-0	0.55	380	0.01	45
Xylene	1330-20-7	89	4,300	1	100
Ethyl benzene	100-41-4	0.1	54,000	0.0	1,000
Cumene	98-82-8			1	400
Toluene	108-88-3	537	37,000	8	5,000
Z-Butoxy ethanol acetate	112-07-2			3	310
Z-butyoxyethanol	111-76-2	38.7	14,000	0.32	13,000
Isopropanol	67-63-0	22	98,000	0	7,000
Aromatic Petroleum Dist.	64742-95-6			9.21	3,800

Source: Sandstone Environmental Associates, Inc.

For PM2.5, NYCDEP identifies a potential impact for the placement of a new sensitive receptor if the modeled concentrations exceed the incremental impact values published in the *Interim Guidance for PM2.5 Analyses* (NYCDEP, BEPA, March 3, 2008). Therefore, the PM2.5 concentrations are not added to background concentrations or compared with the NAAQS.

Based on EPA guidelines, 97% of PM10 (particulates) is presumed to be PM2.5. Thus, United Envelope would add 0.54 ug/m3 of PM2.5 to the 24-hour concentration. This falls below the de minimis value of 2 ug/m3 for the 24-hour interim guidelines. For the annual concentrations, United Envelope would add 0.01 ug/m^3. Thus, no significant impacts from PM2.5 are projected.

Table 15-15
PM2.5 Concentrations (ug/m^3) @ 200'
Compared with NYCDEP Interim Guidelines

Pollutant	24-Hour Concen-tration	NYCDEP Interim Guidelines	Annual Concen-tration	NYCDEP Interim Guidelines
PM2.5	0.027	2	0.01	0.3

Source: Sandstone Environmental Associates, Inc.

Construction Impacts

Air quality impacts associated with construction activities may include fugitive dust, exhaust and emissions from construction equipment, and increased traffic on local roadways. These impacts are temporary in nature. The construction traffic added to the roadways will result in lower volumes than would be experienced under Action Conditions. In addition, the construction activities would be of a low intensity character. Thus, no significant adverse impacts to air quality are anticipated due to construction activities.

G. CONCLUSION

No significant adverse impacts are anticipated due to mobile sources, HVAC exhaust, air toxics, or the horse stables. As noted on the project's site plan contained in the ULURP application (ULURP No. 080010/11 ZMS) (drawing Z-02 Site Plan), the building will use natural gas as the type of fuel for HVAC systems. This measure would ensure that no significant adverse air quality impacts would result from the proposed action. No significant adverse impacts to the proposed action are anticipated from surrounding uses.