A. INTRODUCTION

This chapter assesses the potential impacts of the construction of buildings expected to result on sites in the rezoning area from the proposed zoning map and text amendments. The following sections discuss the potential impacts resulting from the construction of the projected development sites as described in the reasonable worst case development scenario (RWCDS) presented in Chapter 1, "Project Description." Construction impacts, although temporary, can include noticeable and disruptive effects from an action that is associated with construction or could induce construction. Determination of the significance of construction impacts and need for mitigation is generally based on the duration and magnitude of the impacts. Construction impacts are usually important when construction activity could affect traffic conditions, hazardous materials, archaeological resources, the integrity of historic resources, community noise patterns, and air quality conditions.

The Proposed Action consists of zoning map and text amendments, as well as amendments to the city map, which are expected to facilitate the construction of new multi-unit residential buildings and mixed-use buildings. As discussed in Chapter 1, "Project Description," a total of eight projected development sites are proposed to be constructed under the reasonable worst case development scenario (RWCDS). Under the RWCDS, the Proposed Action would result in a total of approximately 1,076 residential units and 74,194 sf of retail.

As described in other chapters of this Environmental Impact Statement (EIS), the projected developments resulting from the Proposed Action are expected to range from 70 to 80 feet in height. The 8 projected development sites would be completed by the analysis year of 2016. In addition, there are 3 potential development sites considered less likely to be developed by the 2016 analysis year.

According to the *CEQR Technical Manual*, construction duration is often broken down into short-term (less than two years) and long-term (two or more years). Where the duration of construction is expected to be short-term, any impacts resulting from such short-term construction generally do not require detailed assessment. As described below, it is estimated that most of the projected development sites entailing new construction would generally take 18 months to complete construction, and would therefore be considered short-term. However, as construction activity associated with the RCWDS would occur on multiple development sites within the same geographic area, such that there is the potential for several construction timelines to overlap, a preliminary assessment of potential construction impacts was prepared in accordance with the guidelines of the *CEQR Technical Manual*, and is presented in this chapter.

B. PRINCIPAL CONCLUSIONS

The inconvenience and disruption arising from the construction of projected development sites could likely include temporary diversions of pedestrians, vehicles, and construction truck traffic to other streets. Given that the 8 projected development sites are distributed over approximately 6 blocks, no one location within the rezoning area would be under construction for the full anticipated construction timeframe. As construction activity associated with the RCWDS would occur on multiple development sites within the same geographic area, such that there is the potential for several construction timelines to overlap, a

preliminary assessment of potential construction impacts was prepared in accordance with the guidelines of the *CEQR Technical Manual*, and is presented in this chapter. As detailed below, construction of the development sites identified in the RWCDS for the Proposed Action would not result in construction-related impacts.

Throughout the construction period, access to surrounding residences, businesses, institutions, and open spaces in the area would be maintained (see discussions below in "Socioeconomic Conditions," and "Transportation"). In addition, throughout the construction period, measures would be implemented to control noise, vibration, and dust on the construction sites and minimize impacts on the surrounding areas in conformance with the City's building code. These measures would include the erection of construction fencing and, in some areas, fencing incorporating sound-reducing measures. In addition to the activity associated with construction, some part of the parcels not yet in construction would be used for construction staging. These uses would not conflict with or significantly affect neighborhood character in the surrounding areas.

As also discussed below, construction-related activities resulting from the Proposed Action are not expected to have any significant adverse impacts on transit or pedestrian conditions, air quality, noise, historic or archaeological resources, or hazardous materials conditions, and a detailed analysis of construction impacts is not warranted. Moreover, the construction process in New York City is highly regulated to ensure that construction period impacts are eliminated or minimized.

C. REGULATORY FRAMEWORK

Governmental Coordination and Oversight

The governmental oversight of construction in New York City is extensive and involves a number of city, state, and federal agencies. Table 15-1 shows the main agencies involved in construction oversight and each agency's areas of responsibility. The primary responsibilities lie with New York City agencies. The New York City Department of Buildings (DOB) has the primary responsibility for ensuring that the construction meets the requirements of the Building Code and that buildings are structurally, electrically, and mechanically safe. In addition, DOB enforces safety regulations to protect both construction workers and the public. The areas of responsibility include installation and operation of construction equipment, such as cranes and lifts, sidewalk shed, and safety netting and scaffolding. The New York City Department of Environmental Protection (DEP) enforces the Noise Code, approves remedial action plans (RAPs) and Construction Health and Safety Plans (CHASPs), and regulates water disposal into the sewer system. The New York City Fire Department (FDNY) has primary oversight for compliance with the Fire Code and for the installation of tanks containing flammable materials. The New York City Department of Transportation (DOT) reviews and approves any traffic lane and sidewalk closures. New York City Transit (NYCT) is in charge of bus stop relocations, and any subsurface construction within 200 feet of a subway. The Landmarks Preservation Commission (LPC) approves studies and testing to prevent loss of archaeological materials and to prevent damage to fragile historic structures.

The New York State Department of Environmental Conservation (NYSDEC) regulates discharge of water into rivers and streams, disposal of hazardous materials, and construction, operation, and removal of bulk petroleum and chemical storage tanks. The New York State Department of Labor (DOL) licenses asbestos workers. On the federal level, the US Environmental Protection Agency (EPA) has wide ranging authority over environmental matters, including air emissions, noise, hazardous materials, and the use of poisons. Much of the responsibility is delegated to the state level. The US Occupational Safety and Health Administration (OSHA) sets standards for work site safety and the construction equipment.

TABLE 15-1
Construction Oversight in New York City

Agency	Area(s) of Responsibility
New York City	
Department of Buildings	Primary oversight for Building Code and site safety
Department of Environmental Protection	Noise, hazardous materials, dewatering
Fire Department	Compliance with Fire Code, tank operation
Department of Transportation	Traffic lane and sidewalk closures
New York City Transit	Bus stop relocation; any subsurface construction within 200 feet of a subway
Landmarks Preservation Commission	Archaeological and historic architectural protection
New York State	
Department of Labor	Asbestos workers
Department of Environmental Conservation	Dewatering, hazardous materials, tanks, Stormwater Pollution Prevention Plan, Industrial SPDES, if any discharge into the Hudson River
United States	
Environmental Protection Agency	Air emissions, noise, hazardous materials, toxic substances
Occupational Safety and Health Administration	Worker safety

Hours of Work

Construction activities for buildings in the city generally take place Monday through Friday, with exceptions that are discussed separately below. In accordance with city laws and regulations, construction work would generally begin at 7:00 AM on weekdays, with workers arriving to prepare work areas between 6:00 AM and 7:00 AM. Normally, work would end at 3:30 PM, but at times the workday could be extended to complete some specific tasks beyond normal work hours, such as completing the drilling of piles, finishing a concrete pour for a floor deck, or completing the bolting of a steel frame erected that day. The extended workday would generally last until about 6:00 PM and would not include all construction workers on-site, but just those involved in the specific task requiring additional work time.

Occasionally, Saturday or overtime hours may be required to complete some time-sensitive tasks. Weekend work requires a permit from the DOB and, in certain instances, approval of a noise mitigation plan from the DEP under the City's Noise Code. The New York City Noise Control Code, as amended December 2005 and effective July 1, 2007 limits construction (absent special circumstances as described below) to weekdays between the hours of 7:00 AM and 6:00 PM, and sets noise limits for certain specific pieces of construction equipment. Construction activities occurring after hours (weekdays between 6:00 PM and 7:00 AM and on weekends) may be permitted only to accommodate: (i) emergency conditions; (ii) public safety; (iii) construction projects by or on behalf of city agencies; (iv) construction activities with minimal noise impacts; and (v) undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts and/or financial considerations. In such cases, the numbers of workers and pieces of equipment in operation would be limited to those needed to complete the particular authorized task. Therefore, the level of activity for any weekend work would be less than a normal workday. The typical weekend workday would be on Saturday from 7:00 AM with worker arrival and site preparation to 5:00 PM for site cleanup.

D. CONCEPTUAL CONSTRUCTION SCHEDULE AND ACTIVITIES

Construction Sequencing

Construction induced by the Proposed Action would take place over an approximately three year period. The reasonable worst case development scenario presented in Chapter 1, "Project Description," does not describe which sites would be developed first or assume a particular sequence of development. However, it is assumed that construction of all projected development sites, including the project site, would likely be completed by 2016. Market considerations will ultimately determine the demand for residential development.

An anticipated construction sequencing for use in the analysis of the Proposed Action was developed based on the above assumptions, and this is illustrated in Figure 15-1. The figure shows the different phases of construction as well as estimates of the numbers of construction workers and trucks associated with each phase. These are discussed in more detail below.

Typical Construction Activities

Following is a general outline of typical scheduling for construction on the projected development sites. It should be noted however that the duration and extent of new construction activities would vary based on which site is being developed.

- Months 1-3: Site clearance, excavation, and foundation. The first 3 months of construction would entail site clearance; digging, pile-driving, pile capping, and excavation for the foundation; dewatering (to the extent required), and reinforcing and pouring of the foundation. Typical equipment used for these activities would include excavators, backhoes, tractors, pile-drivers, hammers, and cranes. Trucks would arrive at the site with pre-mixed concrete and other building materials, and would remove any excavated material and construction debris.
- Months 4-8: Erection of the superstructure. Once the foundations have been completed, the construction of the building's steel framework and decking would take place. This process involves the installation of beams, columns and decking, and would require the use of cranes, derricks, hoists, and welding equipment.
- Months 9-18: Façade and roof construction, mechanical installation, interior and finishing work. This would include the assembly of exterior walls and cladding; installation of heating, ventilation and air conditioning (HVAC) equipment and ductwork; installation and checking of elevator, utility, and life safety systems; and work on interior walls and finishes. During these activities, hoists and cranes would continue to be used, and trucks would remain in use for material supply and construction waste removal. It should be noted that much of this work occurs when the building is fully enclosed, and therefore is not disruptive to the surrounding area.

Construction staging would most likely occur on the projected development sites themselves and may, in some cases, extend within portions of sidewalks and curb and travel lanes of public streets adjacent to the construction sites. During the course of construction, traffic lanes and sidewalks may have to be temporarily closed or protected for varying periods of time. Projected development site 1 has frontage along the north side of Montieth Street and west side of Stanwix Street, and therefore the north curb lane along Montieth Street and the west curb lane along Stanwix Street would be use for construction purposes for the duration of construction. Projected development site 2 has frontage along the south side of Montieth Street, the east side of Bushwick Avenue, the north side of Forrest Street, and the west side of Stanwix Street and therefore, the south curb lane along Montieth Street, the east curb lane along

Projected Development Site	2013												2014												2015												2016											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Projected development site 1													36			36		36		36					36			36																					
													14			17		17		5					5			5																					
Projected development site 2*																		84		84					84			84		84		84		84														
																		32		39					39			11		11		11																
Projected development site 3*																												78		78		78		78		78		78								
																												29		36		36		10		10		10								
Projected development site 4																														55		55		55		55		55		55						
																														21		25		25		7		7		7						
Projected development site 5																												11		11		11		11												
																												4		5		1		1												
Projected development site 6																		5		5					5			5																				
																		2		2					1			1																				
Projected development site 7													6			6		6		6																													
													2			3		1		1																													
Projected development site 8																		6		6					6			6																				
																		2		3					1			1																				
													42			42		137		137					131			220		228		228																
													16			20		54		50					46			51		73		73																

*The construction of Stanwix Street and Noll Street would be built in conjunction with Sites 2 & 3, respectively, during the last phase of construction

26 Demolition/Excavation/Foundation (number indicates estimated # of daily construction workers)

26 Building Superstructure (number indicates estimated # of daily construction workers)

26 Exterior/Interior Fit-Out (number indicates estimated # of daily construction workers)

17 Estimated Number of Construction Trucks per day

Figure 15-1
Assumed Construction Schedule for Assessment of Construction Impacts

Bushwick Avenue, the north curb lane along Forrest Street, and the west curb lane along Stanwix Street would likely be used for construction purposes for the duration of construction. Projected development sites 3, 4, and 5 have frontage along the south side of Noll Street, the east side of Stanwix Street, the north side of Melrose Street, and the west side of Evergreen Avenue, and therefore, the south curb lane of Noll Street, the north curb lane of Melrose Street, the west curb lane of Evergreen Avenue, and the east curb lane of Stanwix Street would likely be used for construction purposes for the duration of construction of these sites. Projected development sites 6, 7, and 8 have frontage along Flushing Avenue and therefore the south curb lane on Flushing Avenue at these site would be used for construction purposes for the duration of construction of this site. Any sidewalk or street closures require the approval of the New York City Department of Transportation's Office of Construction Management and Coordination (NYCDOT-OCMC), the entity that insures critical arteries are not interrupted, especially in peak travel periods.

During the course of construction, traffic lanes and sidewalks adjacent to projected development sites may have to be intermittently or temporarily closed or protected for varying periods of time to allow for certain construction activities. Any sidewalk or street closures would require the approval of the New York City Department of Transportation's Office of Construction Management and Coordination (DOT-OCMC), the entity that insures critical arteries are not interrupted, especially in peak travel periods. Builders would be required to plan and carry out noise and dust control measures during construction. Construction activities would be subject to compliance with the New York City Noise Code and by EPA noise emission standards for construction equipment. In addition, there would be requirements for street crossing and entrance barriers, protective scaffolding, and strict compliance with all applicable construction safety measures.

As part of the Proposed Action, portions of Stanwix Street and Noll Street would be remapped and opened to through traffic. The mapping would allow better access to the proposed mixed-use development and restore the street grid at this location. The Applicant proposes to map and formally bestow to the City the section of Stanwix Street between Montieth Street and Forrest Street and the section of Noll Street between Evergreen Avenue and Stanwix Street. At present, these portions of the unmapped Stanwix and Noll Streets are inaccessible to the public.

Stanwix Street would have a mapped width of 50 feet, including a 30-foot travel way and two 10-foot sidewalks. Noll Street would also have a width of 50 feet, including a 30-foot travel way and two 10-foot sidewalks. These widths are consistent with the adjacent streets connecting to these newly mapped street segments. The NYCDCP and NYCDOT have consulted on the area's circulation plan and recommended the opening of these newly mapped streets. In conjunction with this mapping, selected one-way streets within the study area would change in direction. Montieth Street would change from eastbound operation to westbound operation, Forrest Street would change from westbound operation to eastbound operation and Stanwix Street would change from northbound operation to southbound operation in the vicinity of the project site.

As noted in Figure 15-1, Stanwix Street would be constructed in conjunction with Site 2 and Noll Street would be reconstructed in conjunction with Site 3. The construction of the streets would occur toward the end of the building construction period for Sites 2 and 3. The construction and reconstruction of the streets would not result in additional trucks or workers than what is estimated for those projected development sites. It should be noted that the reconstruction and construction of the streets would be minimal (i.e. minimal grading, etc.) as the streets currently exist, although inaccessible to the public.

All additional public utilities, if necessary, would be installed first. The roads would then be graded and paved to form the roadway. At that time, the curbs and sidewalks would also be installed. Street lights, hydrants, and street trees would also be installed. The final work would be striping the streets and crosswalks. The streets would be built pursuant to all New York City Department of Transportation

(DOT) regulations. All street elements (i.e. street trees, street lighting) would be constructed pursuant to all City regulations.

Estimate of Construction workers

Based on the square footage of each of the 8 projected development sites that would entail demolition and new construction, and estimated construction costs, the person-years[1] of construction employment was estimated for each site. This calculated number was then divided by the anticipated construction period (12-18 months for most sites), to estimate the average number of construction workers on site at any time per quarter. The resultant estimate of the number of workers per quarter for each site is also illustrated in Figure 15-1 and summarized in Table 15-2 below.

TABLE 15-2
Estimated Total Number of Construction Workers and Construction Trucks On-Site Per Day (8 Projected Development Sites With New Construction)

Year	**2013**				**2014**				**2015**				**2016**				**Project Total**	
Quarter	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	Peak	Average
Construction Workers	-	-	-	-	42	42	137	137	131	220	228	228	144	133	133	55	228	117
Daily Construction Trucks	-	-	-	-	16	20	54	50	46	51	73	73	36	17	17	7	73	33

Estimate of Construction Period Trucks

Based on prior EIS documents for new construction projects that contain a similar mix of uses, an estimate of the number of daily construction trucks generated per 100,000 gsf of development was developed for each of the three general construction phases described above. It was estimated that in the first phase of construction, approximately nine trucks would be generated per day per 100,000 gsf of development, 11 daily trucks per 100,000 gsf would be generated in the second phase, and three daily trucks per 100,000 gsf would be generated in the third phase. These ratios were then applied to each of the 8 projected development sites and the resultant estimate of the number of daily trucks per quarter for each site (based on each site's total gsf) is also shown in Figure 15-1, and summarized in Table 15-2 above.

[1] A person-year is the equivalent of one person working full time for one year. This number is estimated from a RIMS II analysis based on the construction cost estimate for each of the 8 projected development sites entailing new construction (assuming $350/square foot for all projected development sites that are new construction).

Determining Peak Year for Cumulative Construction and Operational Effects

According to the *CEQR Technical Manual*, if a project involves multiple development sites over varying construction timelines, a preliminary assessment must take into account whether the operational trips from completed portions of the project and construction trips associated with construction activities could overlap. For the purposes of establishing a reasonable worst case for the construction assessment, based on the conceptual construction schedule presented in Figure 15-1, first quarter of 2016 was selected as the construction peak year for assessment in this chapter. As shown in Figure 15-1, by the first quarter of 2016, there would be 5 sites that are already completed and operational (sites 1, 2, 6, 7 & 8), and 3 sites that are under construction (3, 4, & 5). Any prior year would not have sufficient operational sites for assessment purposes, whereas subsequent years would not have an adequate number of sites under construction.

E. PRELIMINARY ASSESMENT

In accordance with the guidelines of the *CEQR Technical Manual*, this preliminary assessment evaluates the effects associated with the Proposed Action's construction related activities including transportation, air quality, noise, historic and cultural resources, and hazardous materials.

Transportation

The Proposed Action would result in mixed-use development in newly constructed buildings on the 8 projected development sites in the rezoning area over several years. These developments would replace No-Action uses on the development sites, including vacant lots/vehicle storage and industrial/warehousing uses. During construction periods, projected development sites would generate trips by workers traveling to/from the construction sites, as well as trips associated with the movement of materials and equipment. Given typical construction hours, worker trips would be concentrated in off-peak hours and would not represent a substantial increment during the area's peak travel periods.

Construction Traffic

As discussed above, average daily construction worker and truck activities were forecast for each of the projected development sites involving new construction (refer to Figure 15-1). For a conservative reasonable worst-case analysis of potential construction traffic impacts, the peak levels of construction in each calendar quarter were used as the basis for estimating peak hour construction traffic volumes. The proposed construction schedule assumes peak construction activities would occur in the third and fourth quarter of 2015. As shown in Table 15-2 above, during peak construction months in 2015, the daily averages of construction workers and truck traffic were estimated at 228 workers and 73 trucks per day. These represent peak days of work, and many days during the construction period would have fewer construction workers and trucks on-site.

Although construction traffic would peak in the third and fourth quarters of 2015, the first quarter of 2016 was selected as the reasonable worst case analysis year for assessing potential construction-related traffic impacts as it is during this year that overlapping travel demand from construction activities plus demand from completed portions of the project is expected to peak. As shown in Figure 15-1 and Table 15-2 above, during peak construction months in 2015, the daily averages of construction workers and truck traffic were estimated at 144 workers and 36 trucks per day. While this level of construction travel demand is less than what would occur at peak times in the fourth quarter of 2015, as shown in Figure 15-1 and described in more detail later in this chapter, in first quarter 2016 construction travel demand would

overlap with operational demand from an estimated 5 projected development sites that would already have been completed (sites 1, 2, 6, 7, 8).

Peak Construction Worker Travel Demand and Truck Trips in 2016

It is anticipated that construction workers' travel to and from projected development sites would be primarily by public transportation (approximately 70 percent), with a lesser percentage by private autos (approximately 28.9 percent) at an average occupancy of approximately 2.04 persons per auto.[2] It is also estimated that 80 percent of all workers would arrive and depart in the 60-minute period before and after each shift.

The construction schedule assumes that all site activities would take place during the typical construction shift of 7:00 AM to 3:30 PM. Construction truck trips would occur throughout the day (with higher numbers of trips during the early morning), and trucks would remain in the area for relatively short durations. Construction worker travel would typically take place during the hours before and after the work shift.

Table 15-3 shows construction worker auto and construction truck trips during the 2016 peak construction period. The estimated daily vehicle trips were distributed to various hours of the day based on typical work shift allocations and conventional arrival/departure patterns of construction workers and trucks. For construction workers, as noted above, the substantial majority (80 percent) of the arrival and departure trips are expected to take place during the hour before and after each shift. For construction trucks, deliveries would occur throughout the time period while the construction site is active. However, to avoid traffic congestion and ensure that materials are on-site for the start of each shift, construction truck deliveries would often peak during the hour before the regular day shift (25 percent of shift total), overlapping with construction worker arrival traffic. Based on these assumptions, the peak hour construction traffic was estimated for the entire construction period. The total vehicle trips per hour are shown in Table 15-3 along with passenger-car equivalent (PCE) values, which are based on one PCE per auto and two PCEs per truck. Each truck delivery therefore accounts for two truck trip-ends and four PCE trip-ends (in and out combined) during the same hour.

As shown in Table 15-3, in 2016 approximately 8 trucks and 16 autos are expected to arrive at the construction sites during the 6 AM to 7 AM peak arrival hour for construction-related activity, while 4 trucks and 0 autos are expected to do likewise during the 8 AM to 9 AM peak commuter travel hour for the study area. In the afternoon, there would be no truck trips and approximately 16 auto trips (by departing construction workers) during the 3 PM to 4 PM peak departure hour for construction-related activity, while no construction-related auto trip would occur during the 5 PM to 6 PM peak travel hour for the study area. The maximum number of passenger car equivalents, estimated at 48 would occur in the 6 AM to 7 AM period, while PCE values during the peak 8-9 AM and 5-6 PM travel periods would be 16 and zero, respectively. Consequently, these incremental construction vehicle trips, which would be disbursed among various roadways and parking facilities, would not reach the *CEQR Technical Manual* analysis threshold of 50 PCEs either in total or at any one intersection in proximity to rezoning area in any peak hour. A detailed construction traffic analysis is therefore not warranted, as no significant adverse construction traffic impacts would be expected to occur.

[2] Source: *Atlantic Yards Arena and Redevelopment Project FEIS* (2006); Appendix F; Exhibit F17a-1 showing data for a construction site in Times Square.

TABLE 15-3
1Q 2016 Peak Construction Vehicle Trip Projections

Hour	Auto Trips (1)			Truck Trips (2)			Total Vehicle Trips			Total PCEs (3)		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
6 AM – 7 AM	16	0	16	8	8	16	24	8	32	32	16	48
7 AM – 8 AM	4	0	4	4	4	8	8	4	12	12	8	20
8 AM - 9 AM	1	0	0	4	4	8	4	4	8	8	8	16
9 AM – 10 AM	0	0	0	4	4	8	4	4	8	8	8	16
10 AM–11 AM	0	0	0	4	4	8	4	4	8	8	8	16
11 AM – 12 PM	0	0	0	4	4	8	4	4	8	8	8	16
12 PM–1 PM	0	0	0	4	4	8	4	4	8	8	8	16
1 PM – 2 PM	0	0	0	3	3	6	3	3	6	6	6	12
2 PM – 3 PM	0	2	2	1	1	2	1	3	4	2	4	6
3 PM – 4 PM	0	16	16	0	0	0	0	16	16	0	16	16
4 PM – 5 PM	0	2	2	0	0	0	0	2	2	0	2	2
5 PM – 6 PM	0	0	0	0	0	0	0	0	0	0	0	0

Notes:
(1) Construction auto trips were based on a peak of 144 daily workers. A 28.9 percent auto share was assumed for construction workers, at an average occupancy of approximately 2.04 persons per auto. It is assumed that 80 percent of construction worker arrival and departure trips would take place during the hour before and after each shift.
(2) Construction truck trips were based on a peak of 36 daily trucks. Twenty-five percent of daily trucks were conservatively assumed to arrive in the hour before the start of each shift, 5 percent in the last hour of the shift, and 10 percent in each of the remaining hours during the work day. For analysis purposes, each truck delivery was assumed to result in two truck trips (four PCE trips) during the same hour.
(3) PCEs calculated at 1.0 PCE per worker auto and 2.0 per construction truck.

Cumulative Construction and Operational Traffic in 2016

As noted previously, according to the *CEQR Technical Manual*, if a project involves multiple development sites over varying construction timelines, a preliminary assessment must take into account whether the PCEs associated with operational trips from completed portions of the project and construction trips associated with construction activities could overlap and exceed the 50 PCE threshold. If not, further analysis is not required.

As summarized in Table 15-4, the total numbers of construction trips in first quarter 2016 during the 6-7 AM period (30 PCEs), 8-9 AM period (39 PCEs), 3-4 PM period (30 PCEs), and 5-6 PM period (32 PCE) are below the 50 PCE threshold required for detailed analysis. In combination with the operational traffic expected to be generated in first quarter 2016, the total vehicular demand generated would still be less than the 50 PCE *CEQR Technical Manual* analysis threshold, and a detailed first quarter 2016 construction traffic analysis is not warranted.

TABLE 15-4
1Q 2016 Peak Hour Construction and Operational Traffic Volumes

	Peak Hour	Passenger Car Equivalents (PCEs)		
		Construction	Operational	Total
Sites 1, 2, 6, 7, 8	6-7 AM	48	-18	30
	8-9 AM	16	23	39
	3-4 PM	16	14	30
	5-6 PM	0	32	32

Street Lane and Sidewalk Closures

The Proposed Action includes 8 projected development sites dispersed over an approximate 6-block rezoning area. As shown in Figure 15-2, these projected development sites have frontages along Flushing Avenue, Bushwick Avenue, Stanwix Street, Montieth Street, Forrest Street, Melrose Street, and Evergreen Avenue. As discussed above, there could be various curb lane and/or sidewalk closures associated with construction activities at these sites. These activities would include the unloading of construction materials from trucks and the loading of trucks with construction debris. Truck movements would be spread throughout the day and would generally occur between the hours of 6:00 AM and 3:00 PM, depending on the stage of construction. Flaggers are expected to be present during construction to manage the access and movements of trucks. Little if any rerouting of traffic is anticipated, and moving lanes of traffic are expected to be available at all times along the affected streets. It is anticipated that some sidewalks immediately adjacent to the projected development sites under construction would also be closed to accommodate heavy loading areas for at least several months of the construction period for each site. Pedestrians would either walk on the opposite side of the street or in a sectioned-off portion of the street. Detailed Maintenance and Protection of Traffic (MPT) Plans for each site would be submitted for approval to NYCDOT's Office of Construction Mitigation and Coordination (OCMC). Appropriate protective measures for ensuring pedestrian safety surrounding each of the projected development sites would be implemented under these plans.

Transit and Pedestrians Screening

As previously discussed and shown in Figure 15-1 and Table 15-2, in the first quarter 2016 peak construction year, approximately 144 construction workers would travel to and from projected development sites each day. As also discussed above, a total of approximately 70 percent of construction workers are expected to travel to and from the rezoning area by public transit (subway or bus) and 1.1 percent by walking. In addition, it is estimated that approximately 80 percent of all construction workers would arrive and depart in the peak hour before and after each shift. Therefore, construction worker travel demand is expected to generate a total of approximately 82 transit trips in each peak hour. Given that these transit trips would be distributed among three subway stations and bus routes in proximity to projected development sites throughout the rezoning area, the number of incremental trips at any one subway station (or station element) or any one bus route would be less than the 200-trip *CEQR Technical Manual* analysis threshold for a subway station analysis or the 50-trip threshold for a bus analysis (per route per direction) in all peak hours, and significant adverse transit impacts are not anticipated in the first quarter 2016 peak construction year.

The maximum number of walk trips associated with the transit and pedestrian modes in the first quarter 2016 peak construction year is expected to total 82 in any one peak hour. These trips would be widely dispersed among the sidewalks and crosswalks in proximity to each of the projected development sites under construction throughout the rezoning area, and the total number of new trips at any one sidewalk or crosswalk in any peak hour would not exceed the 200-trip *CEQR Technical Manual* pedestrian analysis threshold. Significant adverse pedestrian impacts are therefore not anticipated in the first quarter 2016 peak construction year.

Table 15-5 shows the net incremental transit (subway and bus) and walk-only trips that would be generated by the Proposed Action in first quarter 2016 when construction worker travel demand would overlap with operational demand from completed projected development sites. As shown in Table 15-5, it is estimated that incremental subway trips would generate 88 incremental subway trips in the 6-7 AM peak hour, 267 in the 8-9AM peak hour, 236 in the 3-4PM peak hour, and 311 in the 5-6PM peak hour. Given that these subway trips would be distributed among three subway stations, the number of incremental trips at any one station (or station element) would be less than the 200-trip *CEQR Technical*

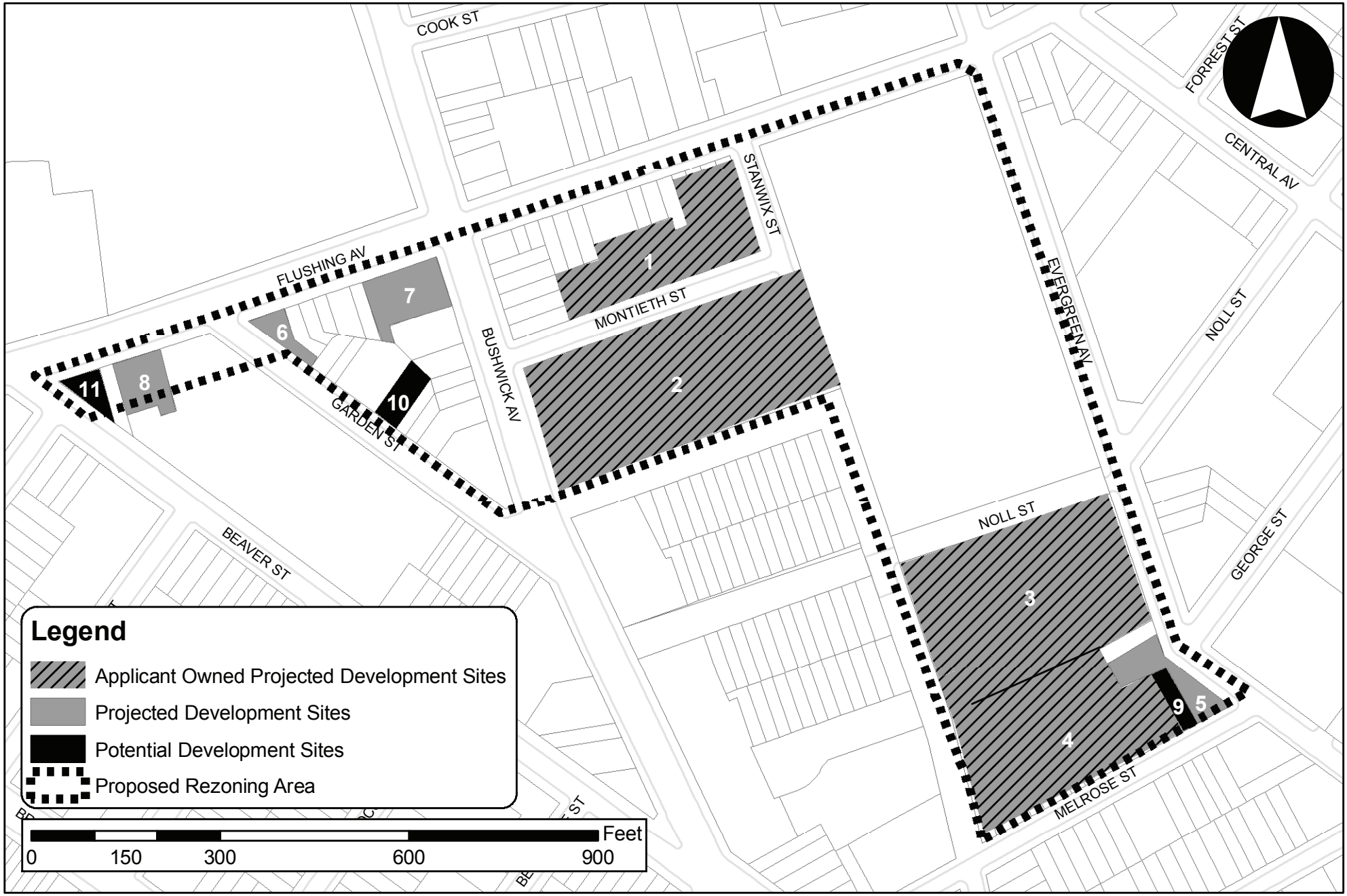

Figure 15-2

RWCDS Projected & Potential Development Sites

Manual analysis threshold in all peak hours, and significant adverse subway station impacts are not anticipated in the first quarter 2016 construction year.

Similarly, as shown in Table 15-5, incremental bus trips would total no more than 67 in any peak hour. Given that these bus trips would be distributed among multiple bus routes in proximity to each cluster, the number of incremental trips in one direction on any one route would be less than the 50-trip *CEQR Technical Manual* analysis threshold in all peak hours, and significant adverse bus impacts are not anticipated in the first quarter 2016 construction year.

As shown in Table 15-5, the maximum number of pedestrian trips generated (including walk-only trips and walk trips to area subway stations and bus stops), is expected to generate 89 incremental transit and walk-only pedestrian trips in the 6-7 AM peak hour, 544 in the 8-9 AM peak hour, 940 in the 3-4 PM peak hour and 1,057 in the 5-6 PM peak hour. However, it is important to note that these trips would also be widely dispersed among the sidewalks and crosswalks in proximity to each of the projected development sites that would be either occupied or under construction. Few if any of these sidewalks or crosswalks are therefore expected to experience incremental demand exceeding the 200-trip *CEQR Technical Manual* analysis threshold in any peak hour. In addition, as discussed in Chapter 10, "Transportation," no significant adverse pedestrian impacts are anticipated with the substantially higher numbers of incremental pedestrian trips forecast with full build-out in 2016 (1,049 trips in the AM peak hour, 2,552 in the midday, 1,910 in the PM). Therefore, significant adverse pedestrian impacts are also not anticipated in the first quarter 2016 construction year.

TABLE 15-5
1Q 2016 Peak Hour Construction and Operational Transit and Walk Trips

	Peak Hour	Subway			Bus			Walk			Total Pedestrian Trips (Transit and Walk)		
		Construction	Operational	Total	Construction	Operational	Total	Construction	Operational	Total	Construction	Operational	Total
Sites 1, 2, 6, 7,8	6-7 AM	65	24	89	16	-3	13	2	-15	-13	83	6	89
	8-9 AM	4	262	266	1	41	42	0	235	235	5	539	544
	3-4 PM	65	171	236	16	46	62	2	640	642	83	857	940
	5-6 PM	0	311	311	0	67	67	0	679	679	0	1,057	1,057

Air Quality

Emissions from on-site construction equipment and on-road construction-related vehicles, as well as dust generating activities, have the potential to affect air quality. In general, much of the heavy equipment used in construction has diesel-powered engines and produces relatively high levels of nitrogen oxides (NO_x) and particulate matter (PM). Gasoline engines produce relatively high levels of carbon monoxide (CO). Fugitive dust generated by construction activities is composed of particulate matter. As a result, the primary air pollutants of concern for construction activities include nitrogen dioxide (NO_2), particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}) and less than or equal to 2.5 micrometers ($PM_{2.5}$), and CO.

The *CEQR Technical Manual* lists several factors for consideration in determining whether a detailed quantified on-site and/or off-site construction impact assessment for air quality is appropriate. For on-site assessment, these factors include: (1) the duration of any heavy construction activity; (2) the type of construction activity; (3) the physical relationship of the project site to nearby sensitive receptors (i.e., residences and schools); (4) the use of emission controls measures such as the nature and extent of

possible use of Best Available Technology (BAT) for construction equipment. All of these factors have been taken into consideration in the construction air quality preliminary assessment undertaken for this project, which, as detailed in the following sections, concludes that a quantified analysis of on-site construction activities is not warranted, and the project would not result in significant adverse construction-period air quality impacts.

1. The Duration of Any Heavy Construction Activity

The *CEQR Technical Manual* does not define "short-term" for air quality assessments, but it has generally been accepted that the term refers to a period of two years or less. While the horizon year for study is 2016 and the overall construction period (for all development sites) due to the Proposed Action may take up to approximately three years to complete, it is expected that any actual development that would occur on an individual projected development site would take less than two years to complete. In addition, the most intense construction activities in terms of air pollutant emissions (demolition, excavation and foundation work where a number of large non-road diesel engines would be employed) are only expected to take up to approximately three months to complete per development site, depending on the size of the development. In addition, based on the conceptual construction phasing plan shown in Figure 15-1, it is not expected that there would be more than approximately 6 months of continuous demolition, excavation, and foundation activities on the projected development sites. Although superstructure construction, exterior construction, and interior fit-outs would continue after demolition, excavation, and foundation work is complete, those efforts would result in much less emissions since heavy duty diesel equipment such as excavators, backhoes, and pile drivers associated with demolition, excavation, and foundation work would no longer be needed on-site. The equipment that would be operating in these later tasks would mostly be small in engine size and/or dispersed vertically throughout the building, resulting in very low concentration increments in adjacent areas.

2. The Type of Construction Activity

The typical construction of a development site, as aforementioned and illustrated in the phasing schedule (see Figure 15-1), consists of three main phases or types of construction. The first type of construction would be demolition, excavation, and foundation. The second type of construction would be the building or outfitting of the superstructure or skeleton of the building. The last type of would be the exterior construction and interior fit-outs of the building.

Demolition of interiors, portions of buildings or entire buildings are regulated by DOB, requiring abatement of asbestos prior to any intrusive construction activities including demolition. OSHA regulates construction activities to prevent excessive exposure of workers to contaminants in the building materials including lead in paint. New York State Solid Waste regulations control where demolition debris and contaminated materials associated with construction are handled and disposed. Adherence to these existing regulations would prevent impacts from development activities at any of the projected development sites in the proposed rezoning area.

During construction, a handful of large non-road diesel engines would operate throughout the rezoning area. These engines would generally move around each projected development site, although it is expected that a concrete pump would be located in one location during concrete pours. As described in other chapters of this EIS, the projected developments resulting from the Proposed Action are expected to range from only 70 to 80 feet in height. In addition, half of the development sites (Projected development sites 5, 6, 7, and 8) would be very small in size, ranging from approximately 21,000 to 46,800 gross square feet of development. As such, it is expected that construction under the Proposed Action would require shorter excavation and foundation construction phases than other taller buildings. Therefore, based on the sizes of project buildings and the nature of the construction work involved, construction

activities resulting from the Proposed Action would not be considered out of the ordinary in terms of intensity, and in fact, emissions would be lower due to the emission control measures that would be implemented during construction of the proposed project (see "Emission Control Measures," below). Furthermore, since construction induced by the Proposed Action would be gradual (taking place over a three-year period) and as shown in Figure 15-1, demolition, excavation, and foundation activities for the larger development sites (i.e., Projected development sites 1, 2, 3, and 4) are not expected to overlap, the emissions intensity would therefore be lower and potential impacts would be minimized.

3. The Physical Relationship of the Project Site to Nearby Sensitive Receptors

The rezoning area contains very few existing residential uses but the development that would be induced by the Proposed Action could potentially occur next to these sensitive receptors locations and others that would be introduced as projected development sites are completed. However, as noted above, the development would occur several years and for the most part would induce projects that would be completed in less than two years. In addition, the most intense construction activities in terms of air pollutant emissions (demolition, excavation and foundation work where a number of large non-road diesel engines would be employed) are only expected to take up to approximately three months to complete per development site. Moreover, while it is possible that buildings on multiple projected development sites within the rezoning area could be under construction at the same time, it is anticipated that, such construction activities, and especially the most disruptive activities in terms of air pollutant emissions, such as demolition, excavation, and foundation activities, would likely occur on sites that are not adjacent to one another and would not have a cumulative effect on adjacent sensitive receptors. Although there are also sensitive receptor locations just outside the rezoning area such as residences on Forrest Street (south of Projected development site 2), residences on Noll Street and Stanwix Street (west of Projected development site 3), Public School 145 and the associated playground (east of Site 3), residences on Melrose Street (south of Projected development sites 4 and 5), and residences on Garden Street and Public School 120 (west of Projected development site 2), these sensitive receptor locations are generally located some distance away from the construction sites (minimum of 50 feet). Such distance between the emissions sources and these sensitive locations would result in enhanced dispersion of pollutants and, therefore, potential concentration increments from on-site sources at such locations would be reduced. Given the size of the construction sites and the space available for Projected development sites 1, 2, 3, and 4, large emissions sources and activities such as concrete trucks and pumps would be located away from residential buildings, schools, and publicly accessible open spaces to the extent practicable.

This analysis assumes that development sites with multiple buildings would be constructed at the same time because the assemblages are under single ownership and would be developed as a single project. For these sites it is unlikely that new buildings would be occupied adjacent to ongoing construction. Therefore there would be no overlap of construction adjacent to new sensitive receptors. Moreover, as indicated in Figure 15-1 and discussed above, the heaviest construction activities would last for a period of approximately three months for each projected development site, and would therefore not affect any nearby sensitive receptors for an extended period of time.

4. Use of Emission Control Measures

Depending on the phase of construction, different types of construction equipment are necessary. The heaviest construction equipment would be used during the demolition, excavation, and foundation phase. To ensure that the construction resulting from the Proposed Action would result in the lowest practicable diesel particulate matter (DPM) emissions, the project would implement an emissions reduction program for all construction activities to the extent practicable, including:

- *Clean Fuel.* Ultra-low sulfur diesel (ULSD) would be used exclusively for all diesel engines throughout the construction sites as mandated by NYC law.
- *Best Available Tailpipe Reduction Technologies*. Nonroad diesel engines with a power rating of 50 horsepower (hp) or greater and controlled truck fleets (i.e., truck fleets under long-term contract with the project) including but not limited to concrete mixing and pumping trucks, would utilize the best available tailpipe (BAT) technology for reducing DPM emissions to the extent practicable and feasible. Diesel particle filters (DPFs) have been identified as being the tailpipe technology currently proven to have the highest reduction capability. Construction contracts would specify that all diesel nonroad engines rated at 50 hp or greater would utilize DPFs, either installed on the engine by the original equipment manufacturer (OEM) or a retrofit DPF verified by the EPA or the California Air Resources Board, and may include active DPFs,[3] if necessary; or other technology proven to achieve an equivalent emissions reduction.
- *Utilization of Newer Equipment.* Additionally, a construction program would use construction equipment rated Tier 3 or higher for all nonroad diesel engines with a power output of 50 hp or greater to the extent practicable and feasible. Tier 3 NOx emissions range from 40 to 60 percent lower than Tier 1 emissions and are considerably lower than uncontrolled engines.
- *Source Location.* In order to reduce the resulting concentration increments, large emissions sources and activities such as concrete trucks and pumps would be located away from residential buildings, academic locations, and publicly accessible open spaces to the extent practicable and feasible.
- *Dust Control.* Strict fugitive dust control plans would also be a part of a possible construction program. For example, stabilized truck exit areas would be established for washing off the wheels of trucks that exit the construction site. Truck routes within a site would be either watered as needed to avoid the re-suspension of dust. All trucks hauling loose material would be equipped with tight fitting tailgates and their loads securely covered prior to leaving the sites. In addition to regular cleaning by the City, streets adjacent to the sites would be cleaned as frequently as needed. Chutes would be used for material drops during demolition. Water sprays would be used for all excavation, demolition, and transfer of spoils to ensure that materials are dampened as necessary to avoid the suspension of dust into the air. In addition, all necessary measures would be implemented to ensure that the New York City Air Pollution Control Code regulating construction-related dust emissions is followed.
- *Idle Restriction.* In addition to adhering to the local law restricting unnecessary idling on roadways, on-site vehicle idle time would also be restricted to three minutes for all equipment and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or otherwise required for the proper operation of the engine

Overall, the proposed emission reduction program is expected to significantly reduce DPM emissions consistent with the goals of the currently best available control technologies under New York City Local Law 77, which are required only for publicly funded City projects. The above measures would also be included in the Restrictive Declaration as part of the approval process for the ~~proposed~~ Proposed ~~actions~~Action. ~~Between the Draft and Final EIS, additional analyses of construction air quality may be prepared. Based on additional analyses, the components of the emissions reduction program described above and the need for a Restrictive Declaration may be adjusted, as appropriate.~~ Accordingly, a detailed qualitative rather than quantitative air quality analysis was provided to assess the potential impacts of on-site construction activities.

[3] There are two types of DPFs currently in use: passive and active. Most DPFs currently in use are the "passive" type, which means that the heat from the exhaust is used to regenerate (burn off) the PM to eliminate the buildup of PM in the filter. Some engines do not maintain temperatures high enough for passive regeneration. In such cases, "active" DPFs can be used (i.e., DPFs that are heated either by an electrical connection from the engine, by plugging in during periods of inactivity, or by removal of the filter for external regeneration).

Fugitive Dust Impacts

Fugitive dust emissions from land clearing operations can occur from excavation, hauling, dumping, spreading, grading, compaction, wind erosion, and traffic over unpaved areas. Actual quantities of emissions depend on the extent and nature of clearing operations, the type of equipment employed, the physical characteristics of underlying soil, the speed at which construction vehicles are operated, and the type of fugitive dust control methods employed. Much of the fugitive dust generated by construction activities generally consists of relatively large-size particles (greater than 100 microns in diameter), which are expected to settle within a short distance (within 20 to 30 feet) from the construction site and to not significantly impact nearby buildings or people. As detailed above, all appropriate fugitive dust control measures—including watering of exposed areas and dust covers for trucks—would be employed during construction of each projected and potential development site to minimize the impacts of fugitive dust emissions. As a result, no significant air quality impacts from fugitive dust emissions would be anticipated during construction.

Diesel Emission Impacts

Emissions from the heavy-duty diesel-fueled construction equipment can also occur from excavation, hauling, dumping, spreading, grading, and compaction. Actual quantities of these emissions depend on the extent and nature of clearing operations, the type of equipment employed, the speed at which construction vehicles are operated, and the type of emission controlled methods employed. These emissions could impact existing land uses as well as development sites that are already operational. For example, in the first quarter of 2016, development sites 1, 2, 6, 7, and 8 would be operational while sites 3, 4, and 5 would be under construction.

Construction of each projected development site would be accomplished using all appropriate emission control measures, including the use of ultra-low sulfur fuel oil, best available tailpipe reduction technologies, utilization of newer equipment, source location restriction, and engine idling restrictions. In addition, these excavation, hauling, dumping, spreading, grading, and compaction activities would generally occur for less than six months at each construction site. As a result, no significant air quality impacts emissions would be anticipated from these emissions.

Mobile Source Impacts

Mobile source emissions typically result from the operation of construction equipment, trucks delivering materials and removing debris, workers' private vehicles, or occasional disruptions in traffic near the construction site. These emissions, however, would be released from vehicles traveling on multiple roadways throughout the rezoning area based on the construction schedule of each development site. In general, the development sites are spread out sufficiently within the study area so as not to cause significant air quality impacts. However, some of the developments that are located in close proximity to one another may be built during the same time frames and cumulative impacts may result.

It is estimated that peak hour construction volumes would consist of 16 passenger vehicles and 16 trucks (8 in, 8 out). These vehicles, however, would be arriving at and departing from multiple development sites, and would therefore not be concentrated at any single intersection – it is estimated that construction traffic would be divided between several different intersections – with no single intersection expected to experience more than 6 trucks and 10 autos in the peak (6-7 AM) period. As these values are less than the applicable *CEQR Technical Manual* threshold values (based on the peak hour heavy duty diesel truck equivalent emissions ($PM_{2.5}$) screening worksheet referenced in Chapter 17, Section 210 of the *CEQR*

Technical Manual, no significant air quality construction impacts from mobile sources are anticipated, and a detailed mobile source analysis is not warranted.

In addition, generally, if a transportation analysis is not needed with regard to construction activities, an air quality assessment of construction vehicles is likely not warranted. As demonstrated above under "Transportation," construction of the proposed project does not require a transportation analysis. The construction would not result in increases in vehicle volumes higher than those identified in the operational condition. Moreover, according to the *CEQR Technical Manual*, if the operational analysis indicates that the project would not result in significant mobile source impacts, and the vehicular trip generation from construction would be less than that of the proposed project, then a more detailed assessment is usually not necessary. As discussed in Chapter 11, "Air Quality," the mobile source analysis conducted for the Proposed Action indicates that no significant mobile source air quality impacts are expected as a result of the Proposed Action. Therefore, pursuant to CEQR guidelines, a detailed assessment of construction-related mobile source air quality is not warranted.

Conclusion

Therefore, based on analysis of all of the factors affecting construction emissions, on-site and off-site construction activities due to construction of the project would not result in any significant adverse impact on air quality.

Noise

Impacts on community noise levels during construction under the Proposed Action could result from noise from construction equipment operation and from construction and delivery vehicles traveling to and from the construction site. Noise and vibration levels at a given location are dependent on the type and number of pieces of construction equipment being operated, the acoustical utilization factor of the equipment (i.e., the percentage of time a piece of equipment is operating at full power), the distance from the construction site, and any shielding effects (from structures such as buildings, walls, or barriers). Noise levels caused by construction activities vary widely and depend on the phase of construction and the location of the construction relative to receptor locations. The most significant construction noise sources are expected to be the movements of trucks to and from the project site, as well as impact equipment such as excavators with ram hoes, pile rigs, rock drills, tower cranes, and paving breakers.

Noise from construction activities and some construction equipment is regulated by the New York City Noise Control Code and by EPA. The New York City Noise Control Code, as amended December 2005 and effective July 1, 2007, requires the adoption and implementation of a noise mitigation plan for each construction site, limits construction (absent special circumstances as described below) to weekdays between the hours of 7:00 AM and 6:00 PM, and sets noise limits for certain specific pieces of construction equipment. Construction activities occurring after hours (weekdays between 6:00 PM and 7:00 AM, and on weekends) may be authorized in the following circumstances: (1) emergency conditions; (2) public safety; (3) construction projects by or on behalf of City agencies; (4) construction activities with minimal noise impacts; and (5) where there is a claim of undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts, and/or financial considerations. EPA requirements mandate that certain classifications of construction equipment meet specified noise emissions standards.

Construction Noise Impact Criteria

The *CEQR Technical Manual* states that significant noise impacts due to construction would occur "only at sensitive receptors that would be subjected to high construction noise levels for an extensive period of time." This has been interpreted to mean that such impacts would occur only at sensitive receptors where

the activity with the potential to create high noise levels (the "intensity") would occur continuously for approximately two years or longer (the "duration"). The *CEQR Technical Manual* states that the impact criteria for vehicular sources, using the No Action noise level as the baseline, should be used for assessing construction impacts. As recommended in the *CEQR Technical Manual*, this study uses the following criteria to define a significant adverse noise impact from mobile and on-site construction activities:

- If the No Action noise level is less than 60 dBA $L_{eq(1)}$, a 5 dBA $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action noise level is between 60 dBA $L_{eq(1)}$ and 62 dBA $L_{eq(1)}$, a resultant $L_{eq(1)}$ of 65 dBA or greater would be considered a significant increase.
- If the No Action noise level is equal to or greater than 62 dBA $L_{eq(1)}$, or if the analysis period is a nighttime period (defined in the CEQR criteria as being between 10:00 PM and 7:00 AM), the incremental significant impact threshold would be 3 dBA $L_{eq(1)}$.

Noise Analysis Fundamentals

Construction activities induced by the Proposed Action would be expected to result in increased noise levels as a result of: (1) the operation of construction equipment on-site; and (2) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the roadways to and from the project site.

Noise from the operation of construction equipment on-site at a specific receptor location near a construction site is generally calculated by computing the sum of the noise produced by all pieces of equipment operating at the construction site. For each piece of equipment, the noise level at a receptor site is a function of the following:

- The noise emission level of the equipment;
- A usage factor, which accounts for the percentage of time the equipment is operating at full power;
- The distance between the piece of equipment and the receptor;
- Topography and ground effects; and
- Shielding.

Similarly, noise levels due to construction-related traffic are a function of the following:

- The noise emission levels of the type of vehicle (e.g., auto, light-duty truck, heavy-duty truck, bus, etc.);
- Volume of vehicular traffic on each roadway segment;
- Vehicular speed;
- The distance between the roadway and the receptor;
- Topography and ground effects; and
- Shielding.

Location of Nearby Sensitive Receptors

The rezoning area contains existing residential uses but the development that would be induced by the Proposed Action could potentially occur next to these sensitive receptors locations, including residences on Flushing Avenue (north and east of Site 1), a residence on Evergreen Avenue (adjacent to Projected development sites 3 and 4), and residences on Bushwick Avenue and Garden Street (adjacent to Projected development sites 6 and 7). There are also sensitive receptor locations just outside the rezoning area such as residences on Forrest Street (south of Projected development site 2), residences on Noll Street and Stanwix Street (west of Projected development site 3), Public School 145 and the associated playground (east of Projected development site 3), residences on Melrose Street (south of Projected development sites 4 and 5), Green Central Knoll Park (northeast of Projected development site 3), and residences on Garden Street and Public School 120 (west of Projected development site 2). These sensitive receptor locations are generally located some distance away from the construction sites (minimum of 50 feet).

These receptor locations in the rezoning area and the adjacent area are those located closest to the construction activities associated with the Proposed Action, and would be most likely to experience elevated noise levels as result of those construction activities, and consequently would have the greatest potential for construction noise impacts. In addition, new sensitive receptors would be created in the rezoning area as residential buildings are completed while other sites are still under construction. However, based on the conceptual construction schedule, these new sensitive receptors would not be introduced until the most noise-intensive construction activities (demolition, excavation, and foundation work) at the nearest construction sites are completed.

Existing weekday daytime noise levels in the area during regular construction hours, as described in Chapter 13, "Noise," range from the mid-60s to low-80s of dBA depending on the specific location and the level of traffic on adjacent roadways.

The sensitive receptor sites are distributed throughout the rezoning area and the adjacent area along several different roadways on several blocks, as are the projected development sites where construction would occur. Because of the disparate nature of the receptors and the construction sites, the amount of construction noise that would occur at each sensitive receptor location would be primarily a function of the activities that occur at the nearest construction site to the receptor rather than the entirety of the construction cumulatively.

The distances between the sensitive receptor locations and their respective nearest construction site(s) varies between adjacent when construction would occur on the same block as a sensitive receptor site, to approximately 50 feet when construction would occur across the street from a sensitive receptor site, to more than 100 feet when construction would occur on an adjacent block. There are also intervening buildings in some cases between the sensitive receptor sites and the nearby construction sites, which provide shielding from the construction noise.

Noise Reduction Measures

Construction activities resulting from the Proposed Action would be required to follow the requirements of the New York City Noise Control Code (New York City Noise Code) for construction noise control measures. Specific noise control measures would be described in a noise mitigation plan required under the New York City Noise Code. These measures would include a variety of source and path controls.

In terms of source controls (i.e., reducing noise levels at the source or during the most sensitive time periods), the following measures would be implemented in accordance with the New York City Noise Code:

- Equipment that meets the sound level standards specified in Subchapter 5 of the New York City Noise Control Code would be used from the start of construction. Table 15-6 shows the noise levels for typical construction equipment and the mandated noise levels for the equipment that would be used for construction of the proposed project.
- As early in the construction period as logistics will allow, diesel- or gas-powered equipment would be replaced with electrical-powered equipment such as welders, water pumps, bench saws, and table saws (i.e., early electrification) to the extent feasible and practicable.
- Where feasible and practicable, construction sites would be configured to minimize back-up alarm noise. In addition, all trucks would not be allowed to idle more than three minutes at the construction site based upon New York City Local Law.
- Contractors and subcontractors would be required to properly maintain their equipment and mufflers.

In terms of path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors), the following measures for construction would be implemented to the extent feasible and practicable:

- Where logistics allow, noisy equipment, such as cranes, concrete pumps, concrete trucks, and delivery trucks, would be located away from and shielded from sensitive receptor locations. Once building foundations are completed, delivery trucks would operate behind a construction fence, where possible;
- Noise barriers would be utilized to provide shielding (e.g., the construction sites would have a minimum 8-foot barrier and, where logistics allow, truck deliveries would take place behind these barriers once building foundations are completed); and
- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents, where feasible) would be used for certain dominant noise equipment to the extent feasible and practical (i.e., asphalt pavers, drill rigs, excavators with ram hoe, and hoists). These barriers are conservatively assumed to offer only a 10 dBA reduction in noise levels for each piece of equipment to which they are applied, as shown in Table 15-6. The details for construction of portable noise barriers, enclosures, tents, etc. are based upon DEP Citywide Construction Noise Mitigation.

Table 15-6
Typical Construction Equipment Noise Emission Levels (dBA)

Equipment List	NYCDEP & FTA Typical Noise Level at 50 feet[1]	Mandated Noise Level at 50 feet[2] Under Subchapter 5 of the NYC Noise Control Code	Noise Level with Path Controls at 50 feet[3]
Asphalt Paver	85	85	75
Asphalt Roller	85	74	
Backhoe/Loader	80	77	
Compressors	80	67	
Concrete Pump	82	79	
Concrete Trucks	85	79	
Cranes	85	77	
Cranes (Tower Cranes)	85	85	75
Delivery Trucks	84	79	
Drill Rigs	84	84	74
Dump Trucks	84	79	
Excavator	85	77	
Excavator with Ram Hoe	90	90	80
Fuel Truck	84	79	
Generators	82	68	
Hoist	85	80	70
Impact Wrenches	85	85	75
Jackhammer	85	82	72
Mortar Mixer	80	63	
Pile Driver	101	95	73[4]
Power Trowel	85	85	75
Powder Actuated Device	85	85	75
Pump (Spray On Fire Proof)	82	76	
Pump (Water)	77	76	
Rebar Bender	80	80	
Rivet Buster	85	85	75
Rock Drill	85	85	75
Saw (Chain Saw)	85	75	
Saw (Concrete Saw)	90	85	75
Saw (Masonry Bench)	85	76	
Saw (Circular & Cut off)	76	76	
Saw (Table Saw)	76	76	
Sledge Hammers	85	85	75
Street Cleaner	80	80	
Tractor Trailer	84	79	
Vibratory Plate Compactor	80	80	
Welding Machines	73	73	

Notes:
1 Sources: Citywide Construction Noise Mitigation, Chapter 28, Department of Environmental Protection of New York City, 2007. Transit Noise and Vibration Impact Assessment, FTA, May 2006.
2 Mandated noise levels are achieved by using quieter equipment, better engine mufflers, and refinements in fan design and improved hydraulic systems.
3 Path controls include portable noise barriers, enclosures, acoustical panels, and curtains, whichever feasible and practical.
4 Based on information from noise bellow system manufacturer.

Construction Noise Analysis

The construction of the various development sites associated with the Proposed Action as described in the conceptual construction schedule would last a total of three years. However, the most noise-intensive construction activities (demolition, excavation, and foundation work) would last for only approximately three months at each development site. Some of the discrete construction tasks and construction at the various development sites would be expected to overlap. As discussed above, the analysis looks first at the intensity of

noise levels during construction, then assesses the potential duration of those noise levels, and finally makes a determination of the potential for impact.

Intensity of Construction Noise

At sensitive receptor locations nearest the development sites where construction would occur, existing noise levels, as mentioned previously, would range from approximately the mid-60s of dBA to low-80s of dBA. Such levels would, in some cases, be comparable to the noise levels resulting from construction, which, with the noise control measures described above for the project's development sites, would be approximately in the mid to high 70s of dBA at 50 to 100 feet, and would consequently not create any exceedances of the *CEQR Technical Manual* noise impact criteria.

At locations within the rezoning area where sensitive receptor locations would be adjacent to construction including residences on Flushing Avenue (north of Projected development site 1), residence on Evergreen Avenue (adjacent to Projected development sites 3 and 4), and residences on Bushwick Avenue and Garden Street (adjacent to Projected development sites 6 and 7), and at locations with lower background levels and where construction would occur close to these locations, including residences on Forrest Street (south of Projected development site 2), residences on Noll Street and Stanwix Street (west of Projected development site 3), Public School 145 and the associated playground (east of Projected development site 3), residences on Melrose Street (south of Projected development sites 4 and 5), Green Central Knoll Park (northeast of Projected development site 3), Green Central Knoll Park (northeast of Projected development site 3), and residences on Garden Street and Public School 120 (west of Projected development site 2), construction may result in exceedances of the *CEQR Technical Manual* noise impact criteria for noise intensity during some limited periods of construction when the most noise-intensive construction activities (demolition, excavation, and foundation work) would occur at sites near these sensitive locations. To minimize noise disruption on the Public School 145 playground, Site 3 would have a minimum 12-foot barrier at the northeast portion of the construction site and, where logistics allow, construction equipment and trucks would be located away from the playground to the extent practicable.

Duration of Construction Noise

Although the overall construction period (for all development sites) due to the Proposed Action may take up to approximately three years to complete, it is expected that any actual development that would occur on an individual projected development site would take less than two years to complete. In addition, the most noise intrusive construction activities (demolition, excavation, and foundation work) are only expected to take up to approximately three months to complete per development site, depending on the size of the development. As illustrated in Figure 15-2, there would be three clusters of development where construction activities would occur in proximity of each other: Projected development sites 1 and 2; Projected development sites 3, 4, and 5; and Projected development sites 6, 7, and 8. As shown in Figure 15-1, the overall construction duration at each of these clusters would be less than two years and the demolition, excavation, and foundation work at each cluster would be expected to last between six continuous months or nine intermittent months. Furthermore, as described in other chapters of this EIS, the projected developments resulting from the Proposed Action are expected to range from only 70 to 80 feet in height. In addition, half of the development sites (Projected development sites 5, 6, 7, and 8) would be very small in size, ranging from approximately 21,000 to 46,800 gross square feet of development. As such, it is expected that construction under the Proposed Action would require shorter excavation and foundation construction phases than other taller buildings.

The loudest construction activities (demolition, excavation, and foundation work) on adjacent sites at residences on Flushing Avenue (north of Projected development site 1), residence on Evergreen Avenue (adjacent to Projected development sites 3 and 4), and residences on Bushwick Avenue and Garden Street

(adjacent to Projected development sites 6 and 7) and at sensitive receptor locations just outside the rezoning area, would occur only in the years 2014 or 2015. Moreover, these activities would occur only intermittently in these years, not continuously. Consequently, even if an exceedance of the *CEQR Technical Manual* noise impact criteria would occur at some sensitive receptor locations during the noisiest work at the nearest construction site, the exceedance would not be expected to occur continuously for 24 months. While the noise level increases may be perceptible and intrusive, they would not be considered "long-term" or significant according to CEQR criteria.

Project-Related Sensitive Receptors

New sensitive receptors would be created in the rezoning area as residential buildings are completed while other sites are still under construction. However, based on the conceptual construction schedule, these new sensitive receptors would not be introduced until the most noise-intensive construction activities (demolition, excavation, and foundation work) at the nearest construction sites are completed. For example, in 2015, Projected development site 1 would be operational while Projected development site 2 would be under construction (exterior/interior fit-out). The later phases of construction including exterior construction and interior fit-outs would require much less heavy construction equipment, and would be better shielded from the nearby sensitive receptors by the buildings being constructed. In addition, these activities would be of very limited duration. While the noise level increases may be perceptible and intrusive, they would not be considered "long-term" or significant according to CEQR criteria.

Construction Noise Impacts

Based on the construction noise screening analysis presented above, no significant adverse noise impacts would be expected at any sensitive receptor locations due to construction associated with the Proposed Action.

Vibration

Construction activities have the potential to result in vibration levels that may in turn result in structural or architectural damage, and/or annoyance or interference with vibration-sensitive activities. In general, vibration levels at a receiver are a function of the source strength (which in turn is dependent upon the construction equipment and methods utilized), the distance between the equipment and the receiver, the characteristics of the transmitting medium, and the receiver building construction. Construction equipment operation causes ground vibrations which spread through the ground and decrease in strength with distance. Vehicular traffic, even in locations close to major roadways, typically does not result in perceptible vibration levels unless there are discontinuities in the roadway surface. With the exception of fragile and possibly historically significant structures or buildings, construction activities generally do not reach the levels that can cause architectural or structural damage, but can achieve levels that may be perceptible and annoying in buildings very close to a construction site. An assessment has been prepared to quantify potential vibration impacts of construction activities on structures and residences near the project site.

Construction Vibration Criteria

For purposes of assessing potential structural or architectural damage, the determination of a significant impact is based on the vibration impact criterion used by LPC of a peak particle velocity (PPV) of 0.50 inches/second. For non-fragile buildings, vibration levels below 0.60 inches/second would not be expected to result in any structural or architectural damage.

For purposes of evaluating potential annoyance or interference with vibration-sensitive activities, vibration levels greater than 65 vibration decibels (VdB) would have the potential to result in significant adverse impacts if they were to occur for a prolonged period of time.

Construction Vibration Analysis Results

There are no historic or cultural resources located adjacent to any projected development site or within the rezoning area. Use of construction equipment that would have the most potential to exceed the 65 VdB criterion at sensitive receptor locations (e.g., equipment used during pile driving and rock blasting) would be perceptible and annoying. Therefore, for limited time periods, perceptible vibration levels may be experienced by occupants and visitors to all of the buildings and locations on and immediately adjacent to the construction sites. However, the operations that would result in these perceptible vibration levels would only occur for finite periods of time at any particular location and, therefore, the resulting vibration levels, while perceptible, would not considered to be significant adverse impacts.

Other Technical Areas

Land Use and Neighborhood Character

According to the *CEQR Technical Manual*, a construction impact analysis of land use and neighborhood character is typically needed if construction would require continuous use of property for an extended duration, thereby having the potential to affect the nature of the land use and character of the neighborhood. A land use and neighborhood character assessment for construction impacts looks at the construction activities that would occur on the site (or portions of the site) and their duration. The analysis determines whether the type and duration of the activities would affect neighborhood land use patterns or neighborhood character. For example, a single property might be used for staging for several years, resulting in a "land use" that would be industrial in nature. Depending on the nature of existing land uses in the surrounding area, this use of a single piece of property for an extended duration and its compatibility with neighboring properties may be assessed to determine whether it would have a significant adverse impact on the surrounding area.

Construction of the 8 projected development sites would be spread over a period of several years, throughout an approximate 6-block rezoning area. Throughout the construction period, access to residences, businesses, and institutions in the area surrounding development sites would be maintained, as required by City regulations. In addition, measures would be implemented to control noise, vibration, emissions, and dust on construction sites, including the erection of construction fencing incorporating sound-reducing measures. Because none of these impacts would be continuous or ultimately permanent, they would not create significant impacts on land use patterns or neighborhood character in the area. Therefore, while construction of the new buildings projected in the RWCDS for the Proposed Action would cause temporary impacts, particularly related to noise, it is expected that such impacts in any given area would be relatively short term, even under the reasonable worst case construction sequencing, and therefore not create a neighborhood character impact (see the construction air and noise assessment above). Therefore, no significant construction impacts to land use and neighborhood character are expected.

Socioeconomic Conditions

According to the *CEQR Technical Manual*, construction impacts to socioeconomic conditions are possible if the proposed project would entail construction of a long duration that could affect the access to and therefore viability of a number of businesses, and if the failure of those businesses has the potential to

affect neighborhood character. During the construction period, construction activities would be dispersed throughout the 6-block proposed rezoning area and would not affect access to particular businesses over an extended duration. No other businesses are near enough to the proposed rezoning area to be affected by construction activities. Therefore, construction impacts to socioeconomic conditions are not expected.

Community Facilities

According to the *CEQR Technical Manual*, construction impacts to community facilities are possible if a community facility would be directly affected by construction (*e.g.*, if construction would disrupt services provided at the facility or close the facility temporarily, *etc.*). While there are community facilities in the vicinity of the rezoning area, none would be directly displaced by construction of the 8 projected development sites. It will not be necessary to alter the entrances to these facilities, nor will it be necessary to close them at any time during the construction period. There would be no direct or indirect construction effects to any community facilities. Hence, no construction impacts would be expected to community facilities in the area, and a further preliminary assessment is not needed for the disclosure of potential construction impacts to community facilities.

Open Space

According to the *CEQR Technical Manual*, construction impacts to open space are possible if the open space is taken out of service for a period of time during the construction process. No open space resources would be disrupted during the construction of the development sites identified in the RWCDS, nor would access to any publically accessible open space be impeded during construction within the proposed rezoning area. As such, no construction impacts related to open space are expected and a further preliminary assessment is not needed for the disclosure of potential construction impacts to open space resources.

Historic and Cultural Resources

According to the guidelines in the *CEQR Technical Manual*, construction impacts may occur on historic and cultural resources if in-ground disturbances or vibrations associated with project construction could undermine the foundation or structural integrity of nearby resources.

There are no historic or cultural resources located adjacent to any projected development site or within the rezoning area. As such, no construction impacts related to historic and cultural resources are expected and a further preliminary assessment is not needed for the disclosure of potential construction impacts to historic and cultural resources.

Natural Resources

According to the *CEQR Technical Manual*, natural resources may be affected during construction, particularly during such activities as excavation; grading; site clearance or other vegetation removal; cutting; filling; installation of piles, bulkheads or other waterfront structures; dredging; dewatering; or soil compaction from construction vehicles and equipment. A preliminary construction assessment is not required for natural resources unless the construction activities would disturb a site or be located adjacent to a site containing natural resources.

There are no natural resources on any of the development sites identified in the RWCDS, or their vicinity. Therefore, no significant construction impacts to natural resources are expected, and a further preliminary assessment is not needed for the disclosure of potential impacts to natural resources.

Hazardous Materials

According to the guidelines in the *CEQR Technical Manual*, any impacts from in-ground disturbance that are identified in hazardous materials studies should be identified in this chapter as well. Institutional controls such as (E) designation or restrictive declarations should be disclosed here as well. If the impact identified in hazardous materials studies is fully mitigated or avoided, no further analysis of the effect from construction activities on hazardous materials is needed.

Any potential construction-related hazardous materials impact would be avoided by the inclusion of (E) designations for all of the RWCDS development sites. As detailed in Chapter 8, "Hazardous Materials," to ensure that the Proposed Action would not result in significant, adverse hazardous materials impacts, (E) designations would be mapped on 8 projected and 3 potential development sites as part of the Proposed Action. As discussed in Chapter 8, an (E) designated site is an area designated on a zoning map within which no change of use or development requiring a New York City Department of Buildings permit may be issued without approval of the Mayor's Office of Environmental Remediation (OER). These sites require the OER's review to ensure protection of human health and the environment from any known or suspected hazardous materials associated with the site. As described in Chapter 8, the (E) designation ensures that the fee owner conduct a testing and sampling protocol and remediation, where appropriate, to the satisfaction of the OER before the issuance of a permit by the Department of Buildings. The environmental requirements for the (E) designation also include mandatory construction-related health and safety plan, which must also be approved by the OER.

In addition, demolition of interiors, portions of existing buildings or entire buildings are regulated by the NYC Department of Buildings requiring abatement of asbestos prior to any intrusive construction activities including demolition. OSHA regulates construction activities to prevent excessive exposure of workers to contaminants in the building materials including lead in paint. New York State Solid Waste regulations control where demolition debris and contaminated materials associated with construction are handled and disposed. Adherence to these existing regulations would prevent impacts from construction activities at any of the projected development sites in the proposed rezoning area.

As discussed above, construction-related activities resulting from the Proposed Action are not expected to have any significant adverse impacts on traffic, transit or pedestrian conditions, air quality, noise, historic or archaeological resources, land use or neighborhood character, socioeconomic conditions, community facilities, open space, natural resources, or hazardous materials conditions, and a detailed analysis of construction impacts is not warranted.