7.12 NOISE

7.12.1 Introduction

Construction activities have the potential to produce noise levels that may be annoying or disturbing to humans. This Section describes existing noise conditions in the vicinity of the E. 61st Street Shaft Site and assesses the potential for construction of Shaft 33B at the E. 61st Street Shaft Site to result in noise impacts. The potential for noise impacts during operation of the Shaft is also discussed. The methodology used to prepare this Section is described in Section 3.12, "Noise," in Chapter 3, "Impact Methodologies."

In addition to the Shaft Site itself, this analysis assesses construction of a water main connection that would travel from the Shaft Site to the potential First Avenue route, Sutton Place route, or E. 59th Street/E. 61st Street route. Potential noise impacts associated with this connection would be similar to those described for construction of the water mains in Section 5.12, "Noise," of Chapter 5, "Water Main Connections." A cumulative assessment of potential noise impacts from shaft and water main construction is also presented in Section 5.12.

7.12.2 Existing Conditions

An ambient noise survey was conducted to establish baseline noise levels at sensitive receptors in the vicinity of the E. 61st Street Shaft Site. The Shaft Site is located in a noisy area that is influenced by vehicular traffic from the adjacent Queensboro Bridge (Bridge) exit ramp, and commercial traffic on E. 61st Street which immediately borders the site. Traffic on these roads is often heavy, particularly during the commuter rush hours. E. 61st Street is a primary access route for vehicles accessing the Queensboro Bridge. The surrounding neighborhood is a mix of high-density residential apartment buildings, retail stores and shops, restaurants and bars, and day care and child development centers.

Monitoring Locations

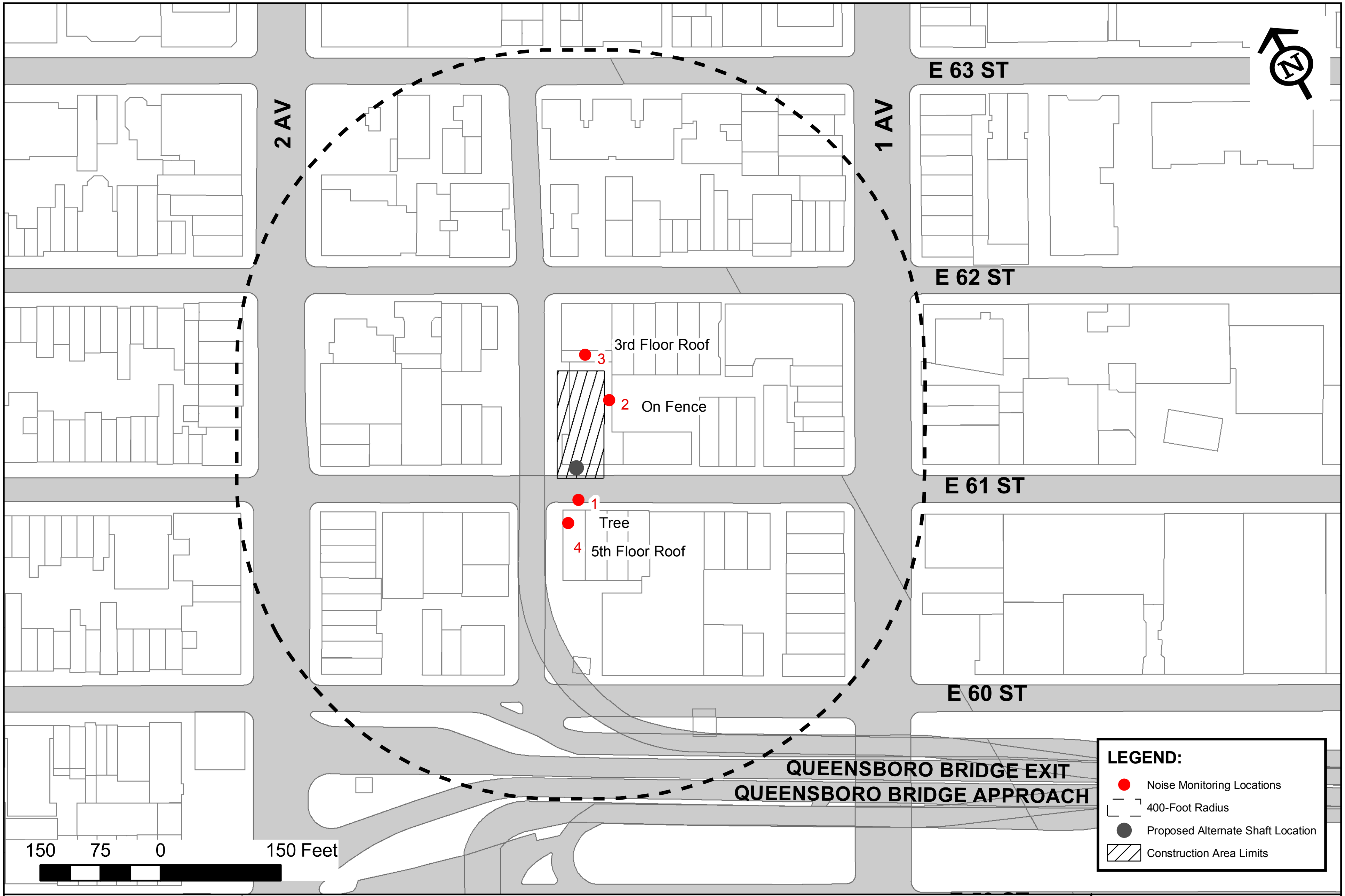
Ambient noise monitoring was performed at four monitoring locations between November 17 and 19, 2004 to assess the existing noise environment surrounding the E. 61st Street Shaft Site. The four ambient noise monitoring locations near the Shaft Site are shown in Figure 7.12-1 and include:

Location 1: Tree in front of 328 E. 61st Street.

Location 2: Backyard of 323 E. 61st Street. This is the residential structure that belongs to Our Lady of Perpetual Help (closest ground level noise monitoring location to the site).

Location 3: Third floor rear rooftop at Manhattan Center for Early Learning located on E. 62nd Street (closest elevated noise monitoring location to the site).

Source:
-Primary Land Use Tax Lot Output (PLUTO) data files. City of New York Department of City Planning (DCP). December, 2003.



Map Document: (S:\Projects\2175158\GIS_Figures\Shaft_33B\Site&Traffic\33B_Alt_F(NOISE)_receptors.mxd)
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NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
STAGE 2 - MANHATTAN LEG
E. 61ST STREET SHAFT SITE
NOISE MONITORING LOCATIONS

FIGURE 7.12-1

Location 4: Fifth floor rooftop at 328 E. 62nd Street.

Construction at the Shaft 33B site is expected to occur over two shifts—from 7:00 a.m. to 3:00 p.m. and from 3:00 p.m. to 11:00 p.m. Therefore, the ambient noise monitoring was performed during these periods as described in Section 3.12.

Monitoring Results

Minimum hourly Leq(1) noise levels at each of the four monitoring locations, based on the noise monitoring results, are provided in Table 7.12-1. Minimum hourly Leq(1) levels are provided for each of the two assessment time periods - the first construction shift (7:00 a.m. to 3:00 p.m.) and second construction shift (3:00 p.m. to 11:00 p.m.).

Table 7.12-1
Baseline Ambient Noise Monitoring Results for the E. 61st Street Shaft Site

Noise Monitoring Locations	1st shift (7am to 3pm) Minimum L_{eq} (dBA)	2nd shift (3pm to 11pm) Minimum L_{eq} (dBA)
Location 1: Tree in front of 328 E. 61st Street.	65	63
Location 2: Backyard of 323 E. 61st Street (closest ground level noise monitoring location to the Site).	63	61
Location 3: Third floor rear rooftop at Manhattan Center for Early Learning located on E. 62nd Street (closest elevated noise monitoring location to the Site).	70	67
Location 4: Fifth floor rooftop at 328 E. 62nd Street.	68	67

For the first shift time period (7:00 a.m. to 3:00 p.m.), at the ground level survey locations (Locations 1 and 2), the minimum hourly Leq(1) noise levels were 65 and 63 dBA, respectively. For the elevated survey locations (Location 3 and 4), the minimum hourly Leq(1) noise level were 70 and 68 dBA, respectively. For the second shift time period (3:00 p.m. to 11:00 p.m.), the minimum hourly Leq(1) noise levels ranged from 61 to 67 dBA.

These ambient noise levels are in the vicinity of the 65dBA Leq(1) CEQR threshold of acceptability. The primary factor influencing the high existing ambient conditions in this area is vehicular traffic. Detailed noise data recorded at the survey locations is provided in Appendix 12.

7.12.3 Future Conditions Without the Project

As described in Section 7.2, "Land Use and Community Facilities, Zoning, and Public Policy," three development projects are anticipated in the 400-foot Study Area in the Future Without the Project: a new 16-story Ronald McDonald House and a new 160-bed dormitory for The Rockefeller University, both planned on the north side of E. 60th Street, and a new, 19-story apartment building containing 45-units is under construction at 1115 First Avenue, between E. 61st and E. 62nd Streets. None of these projects are within the area that would be significantly impacted by the project as discussed in "Future Conditions with the Project" below. Noise levels would be expected to be comparable to those currently existing in the vicinity of the E. 61st Street Shaft Site.

7.12.4 Future Conditions With the Project

Construction

Blasting

Blasting would result in high instantaneous noise levels. Blasting would be necessary at the Shaft Site to enlarge the shaft and form the distribution chamber at the top of the shaft. Blasting would not occur at the ground surface since the bedrock at the site is more than 18 feet below the ground surface. As with the preferred Shaft Site, blasting would be expected to occur for roughly eight months under the raise bore method. Under the surface excavation method, blasting would occur over a 24 month period (18 months for the shaft and 6 months for the distribution chamber). While the time period is longer for the surface excavation method, there would be one, rather than two, blasts per day for the shaft work and two per day for the distribution chamber work (as with the raise bore method).

Blasting has an instantaneous effect. Noise levels associated with blasting are dependent on the amount of explosive used, geological conditions between the blast site and the receptor, and the fact that blasting will take place at least 18 feet below the surface. Section 4.12, "Noise," in Chapter 4, "Preferred Shaft Site," discusses blasting procedures including protective measures that will be implemented to minimize potential construction-related noise impacts from blasting at the preferred Shaft Site. The same procedures would be put in place at the E. 61st Street Shaft Site. However, despite these measures, blasting noise could result in startle effects and be intrusive and disturbing to humans.

Other Construction Activities

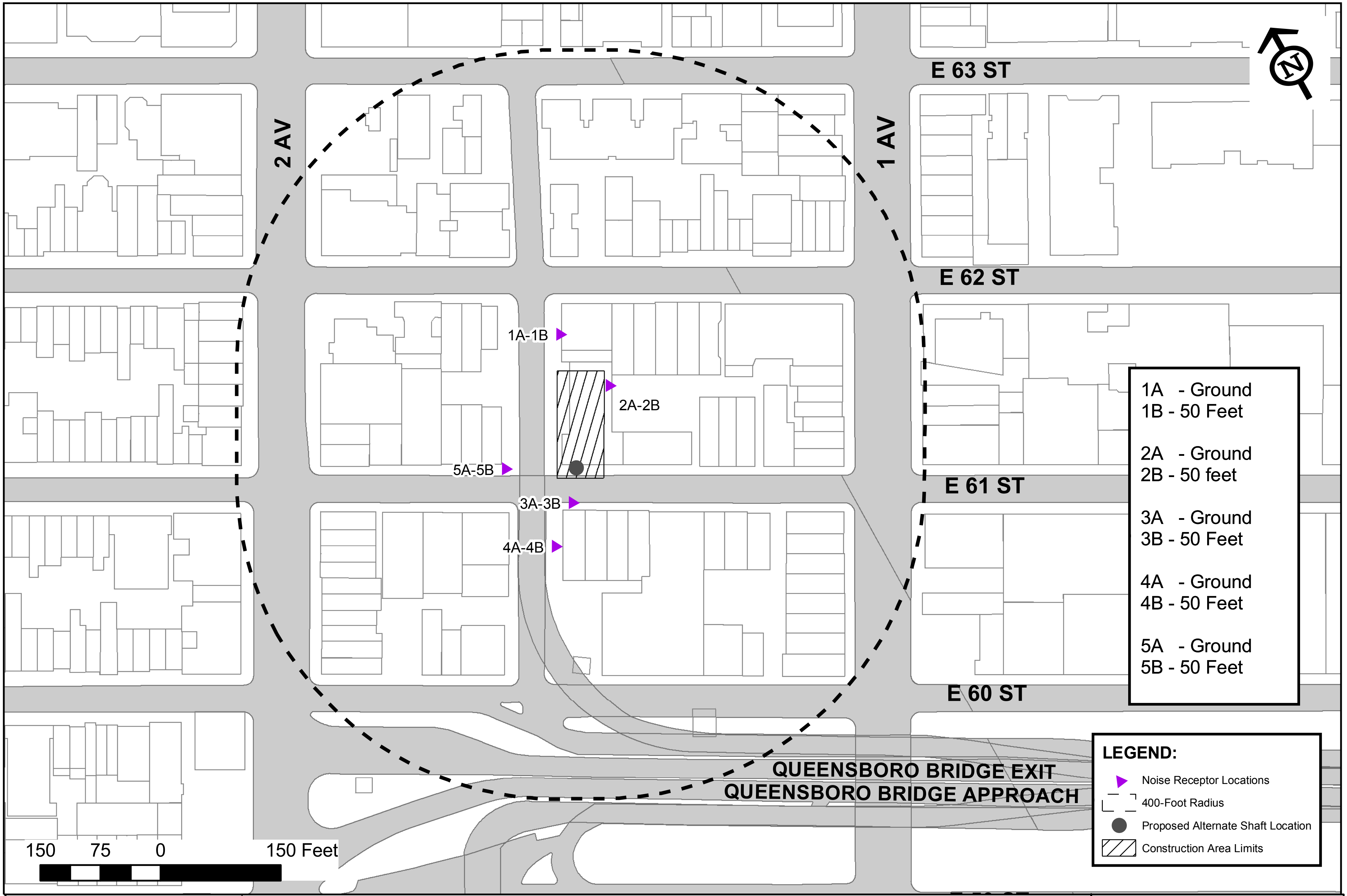
Sensitive Receptors Used in the Analysis

As shown in Table 7.12-2 and Figure 7.12-2, receptors were selected at five locations in the immediate vicinity of the Shaft Site to assess potential construction noise impacts. In addition, at each of these 5 receptors, an elevated receptor at 50 feet was selected to determine impacts to residences and other sensitive uses located on upper floors. Receptors include residences, a day care center, and a church-related facility. These receptors are considered to be representative of other sensitive uses in the area. In several instances, the receptor locations were in the same locations as the ambient noise monitoring locations (see Section 7.12.2, "Existing Conditions," above).

Scenarios Analyzed

As detailed in the Section 7.1, "Project Description," construction of the shaft would occur in stages representing specific construction activities and equipment on the sites. Therefore, an analysis was performed for each shift for each stage of construction.

Source:
-Primary Land Use Tax Lot Output (PLUTO) data files. City of New York Department of City Planning (DCP). December, 2003.



Map Document: (S:\Projects\21175158\GIS_Figures\Shaft_33B\Site&Traffic\33B_Alt_F(NOISE)_receptors(2).mxd)
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NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
STAGE 2 - MANHATTAN LEG
E. 61ST STREET SHAFT SITE
NOISE RECEPTOR LOCATIONS

FIGURE 7.12-2

Table 7.12-2
Identification and Description of Selected Shaft Receptor Locations

Receptor Number	Receptor Identification and Description	Approximate Horizontal Distance to Center of Shaft 33B
1	Manhattan Center for Early Learning—west façade *(Receptors 1A/1B: ground floor/ 50 feet)*	102
2	Manhattan Center for Early Learning—south façade and Backyard of 323 E. 61st Street—residential facility associated with Our Lady Of Perpetual Help *(Receptors 2A/2B: ground floor/ 50 feet)*	72
3	328 E. 61st Street—north façade *(Receptors 3A/3B: ground floor/ 50 feet)*	89
4	328 E. 61st Street—west facade *(Receptors 4A/4B: ground floor/ 50 feet)*	144
5	Residential building immediately north of the Bridge exit ramp *(Receptors 5A/5B: ground floor/ 50 feet)*	105

Construction at the Shaft 33B site is expected to occur over two shifts—from 7:00 a.m. to 3:00 p.m. and from 3:00 p.m. to 11:00 p.m. and both shifts were analyzed as discussed above under Section 7.12.2, "Existing Conditions." Raise boring the shaft, which would be a 24-hour operation for less than 3 months, would have minimal noise impacts since it takes place below ground and requires little surface activity.

In addition, as described in detail in Section 3.12, an 8-hour "average period" analysis and reasonable worst case "peak period" analysis were performed for each stage of construction. The average period analysis is based on average equipment utilization rates over an average 8-hour shift. The peak period analysis is based on a smaller mix of equipment that would typically operate for a greater percentage of time during one or more hours of a shift. See Appendix 12 for average and peak period equipment utilization rates. The average and peak analyses are performed for each shift, for a total of 4 scenarios per stage.

At the E. 61st Street Shaft Site, there is the potential that shaft construction would be undertaken using the surface excavation method, rather than the raise bore method (see Chapter 2, "Purpose and Need and Project Overview" for a discussion of these methods). The differences between the two methods in relation to potential noise impacts are discussed below.

Measures to Reduce Noise at the Site

The analysis includes several measures that would be provided at the Shaft Site to minimize potential noise impacts from construction. This includes a prefabricated 20-foot concrete wall to be constructed around the perimeter of the Shaft Site. The wall will be covered with a sound absorptive fabric on the inside to reduce reflective noise. During Stage 4B only, the southern end of the site would have a 10 foot wall. Since concrete operations during Stages 2C, 3, and 4A are among the noisiest operations, the concrete mixing trucks will also be enclosed in an acoustical sound enclosure providing 15 dBA attenuation.

While not assumed in the quantitative assessment, NYCDEP will undertake a number of other measures to minimize noise impacts from the project. The contractor will also be required to have a noise monitoring program in place during all construction activities. A high quality muffler will be used on the crane engine. NYCDEP will also require the contractor to use newer equipment (2003 or later for most equipment) and minimize idling. Other noise abatement measures that the contractor may be required to take as necessary include soundproof housings or enclosures for noise producing machines and other facilities; use of electrically operated hoists and compressor plants; silencers on air intakes and exhaust mufflers on internal combustion engines; maximum sized intake and exhaust mufflers on internal combustion engines; gears on machinery designed to reduce noise to a minimum; hoppers and storage bins lined with sound deadening material; possible prohibition of the use of air or gasoline driven saws and similar equipment; and delivering and removing materials, and the loading and unloading of materials into or from various conveyances in such a manner that will keep noise to a minimum.

Through NYCDEP's authority under the construction contract, the Tunneling Permit, and the New York City Noise Code, NYCDEP can send inspectors to the site, enforce against the contractor, and require further attenuation measures or shutdown construction on the site if noise is too excessive.

Potential Noise Impacts - Introduction

Table 7.12-3 and Table 7.12-4 present the results of the modeling for the average and peak periods respectively. For each stage and each shift, the existing ambient noise levels, noise levels generated by the construction equipment, and total combined existing and construction-generated noise levels are provided at each of the ground and elevated receptor locations. Also provided is the increase between the combined level and existing conditions. To determine potential noise impacts, this increase is compared to the 3 dBA CEQR impact threshold; those instances where the 3 dBA threshold is exceeded are shaded on the tables. In addition to the impacts discussed below, pavement cutters and pavers would be used for only a few days during shaft construction. During these short periods, noise levels would be slightly higher than those discussed below; however, the potential impacts would be very short-term and temporary.

Potential Noise Impacts – Average Period Analysis

The average period analysis shows that incremental noise levels from construction would exceed 3 dBA for all stages of construction. Impacts would occur at Receptors 1, 2 and 3 and 4 (see Figure 6.12-2 for a map of the receptor sites). Elevated receptors 1B, 2B, 3B, and 4B are more likely to exceed the 3 dBA CEQR threshold than ground level receptors, which would be protected by the Site's concrete wall. Noise levels at elevated Receptor 4 would exceed 3 dBA only during Shift 1 of Stage 1. At all locations further from the construction site, the estimated

Table 7.12-3
Noise Levels – Average Workday

Stage 1 Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	64.6	71	1.1	1A	67	64.6	69	2.0
1B	70	76.7	78	7.5	1B	67	76.7	77	10.1
2A	63	65.2	67	4.2	2A	61	65.2	67	5.6
2B	63	80	80	17.1	2B	61	80	80	19.1
3A	65	62.9	67	2.1	3A	63	62.9	66	3.0
3B	68	75.7	76	8.4	3B	67	75.7	76	9.2
4A	65	57	66	0.6	4A	63	57	64	1.0
4B	68	69.6	72	3.9	4B	67	69.6	72	4.5
5A	65	50.7	65	0.2	5A	63	50.7	63	0.2
5B	68	58.7	68	0.5	5B	67	58.7	68	0.6

Stage 2C Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	55.1	70	0.1	1A	67	55.1	67	0.3
1B	70	66.2	72	1.5	1B	67	66.2	70	2.6
2A	63	57.5	64	1.1	2A	61	57.5	63	1.6
2B	63	70.9	72	8.6	2B	61	70.9	71	10.3
3A	65	54.5	65	0.4	3A	63	54.5	64	0.6
3B	68	66.1	70	2.2	3B	67	66.1	70	2.6
4A	65	50	65	0.1	4A	63	50	63	0.2
4B	68	60.3	69	0.7	4B	67	60.3	68	0.8
5A	65	46.7	65	0.1	5A	63	46.7	63	0.1
5B	68	50.7	68	0.1	5B	67	50.7	67	0.1

Stage 2A Construction*

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	29.8	70	0.0	1A	67	29.8	67	0.0
1B	70	46.8	70	0.0	1B	67	46.8	67	0.0
2A	63	32.3	63	0.0	2A	61	32.3	61	0.0
2B	63	49.9	63	0.2	2B	61	49.9	61	0.3
3A	65	32.5	65	0.0	3A	63	32.5	63	0.0
3B	68	47.7	68	0.0	3B	67	47.7	67	0.0
4A	65	28.8	65	0.0	4A	63	28.8	63	0.0
4B	68	44.2	68	0.0	4B	67	44.2	67	0.0
5A	65	21.9	65	0.0	5A	63	21.9	63	0.0
5B	68	27.2	68	0.0	5B	67	27.2	67	0.0

Stage 3 Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	55.6	70	0.2	1A	67	55.6	67	0.3
1B	70	67.5	72	1.9	1B	67	67.5	70	3.3
2A	63	57.4	64	1.1	2A	61	57.4	63	1.6
2B	63	72	73	9.5	2B	61	72	72	11.3
3A	65	54.4	65	0.4	3A	63	54.4	64	0.6
3B	68	67.1	71	2.6	3B	67	67.1	70	3.1
4A	65	49.9	65	0.1	4A	63	49.9	63	0.2
4B	68	61.2	69	0.8	4B	67	61.2	68	1.0
5A	65	42.4	65	0.0	5A	63	42.4	63	0.0
5B	68	50.4	68	0.1	5B	67	50.4	67	0.1

Stage 2B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	59.7	70	0.4	1A	67	59.7	68	0.7
1B	70	72.1	74	4.2	1B	67	72.1	73	6.3
2A	63	62.3	66	2.7	2A	61	62.3	65	3.7
2B	63	74.9	75	12.2	2B	61	74.9	75	14.1
3A	65	60.3	66	1.3	3A	63	60.3	65	1.9
3B	68	71.7	73	5.2	3B	67	71.7	73	6.0
4A	65	55	65	0.4	4A	63	55	64	0.6
4B	68	66.3	70	2.2	4B	67	66.3	70	2.7
5A	65	53.9	65	0.3	5A	63	53.9	64	0.5
5B	68	56.6	68	0.3	5B	67	56.6	67	0.4

Stage 4A Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	56.5	70	0.2	1A	67	56.5	67	0.4
1B	70	69.6	73	2.8	1B	67	69.6	72	4.5
2A	63	59	64	1.5	2A	61	59	63	2.1
2B	63	72.6	73	10.1	2B	61	72.6	73	11.9
3A	65	56.1	66	0.5	3A	63	56.1	64	0.8
3B	68	68.5	71	3.3	3B	67	68.5	71	3.8
4A	65	50.2	65	0.1	4A	63	50.2	63	0.2
4B	68	62	69	1.0	4B	67	62	68	1.2
5A	65	43.7	65	0.0	5A	63	43.7	63	0.1
5B	68	52.5	68	0.1	5B	67	52.5	67	0.2

Stage 4B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	60.2	70	0.4	1A	67	60.2	68	0.8
1B	70	75.4	77	6.5	1B	67	75.4	76	9.0
2A	63	63.5	66	3.3	2A	61	63.5	65	4.4
2B	63	78.8	79	15.9	2B	61	78.8	79	17.9
3A	65	68.1	70	4.8	3A	63	68.1	69	6.3
3B	68	76.1	77	8.7	3B	67	76.1	77	9.6
4A	65	58.5	66	0.9	4A	63	58.5	64	1.3
4B	68	64.4	70	1.6	4B	67	64.4	69	1.9
5A	65	61.9	67	1.7	5A	63	61.9	65	2.5
5B	68	65.8	70	2.0	5B	67	65.8	69	2.5

Stage 4C Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	53.3	70	0.1	1A	67	53.3	67	0.2
1B	70	66.5	72	1.6	1B	67	66.5	70	2.8
2A	63	56.6	64	0.9	2A	61	56.6	62	1.3
2B	63	69.2	70	7.1	2B	61	69.2	70	8.8
3A	65	53.9	65	0.3	3A	63	53.9	64	0.5
3B	68	65.8	70	2.0	3B	67	65.8	69	2.5
4A	65	46.2	65	0.1	4A	63	46.2	63	0.1
4B	68	58	68	0.4	4B	67	58	68	0.5
5A	65	41.1	65	0.0	5A	63	41.1	63	0.0
5B	68	50.8	68	0.1	5B	67	50.8	67	0.1

*Numbers for Stage 2A have changed from the Draft EIS.

Table 7.12-4
Noise Levels – Peak Hour

Stage 1 Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	69	73	2.5	1A	67	69	71	4.1
1B	70	81	81	11.3	1B	67	81	81	14.2
2A	63	66.3	68	5.0	2A	61	66.3	67	6.4
2B	63	81.5	82	18.6	2B	61	81.5	82	20.5
3A	65	64.7	68	2.9	3A	63	64.7	67	3.9
3B	68	77.3	78	9.8	3B	67	77.3	78	10.7
4A	65	60.7	66	1.4	4A	63	60.7	65	2.0
4B	68	72.2	74	5.6	4B	67	72.2	73	6.3
5A	65	52.4	65	0.2	5A	63	52.4	63	0.4
5B	68	59.8	69	0.6	5B	67	59.8	68	0.8

Stage 2B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	66.3	72	1.5	1A	67	66.3	70	2.7
1B	70	76.9	78	7.7	1B	67	76.9	77	10.3
2A	63	65.9	68	4.7	2A	61	65.9	67	6.1
2B	63	76.8	77	14.0	2B	61	76.8	77	15.9
3A	65	63.9	67	2.5	3A	63	63.9	66	3.5
3B	68	72.1	74	5.5	3B	67	72.1	73	6.3
4A	65	60.7	66	1.4	4A	63	60.7	65	2.0
4B	68	68.7	71	3.4	4B	67	68.7	71	3.9
5A	65	60.2	66	1.2	5A	63	60.2	65	1.8
5B	68	60.4	69	0.7	5B	67	60.4	68	0.9

Stage 2A Construction*

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	29.8	70	0.0	1A	67	29.8	67	0.0
1B	70	46.8	70	0.0	1B	67	46.8	67	0.0
2A	63	32.3	63	0.0	2A	61	32.3	61	0.0
2B	63	49.9	63	0.2	2B	61	49.9	61	0.3
3A	65	32.5	65	0.0	3A	63	32.5	63	0.0
3B	68	47.7	68	0.0	3B	67	47.7	67	0.0
4A	65	28.8	65	0.0	4A	63	28.8	63	0.0
4B	68	44.2	68	0.0	4B	67	44.2	67	0.0
5A	65	21.9	65	0.0	5A	63	21.9	63	0.0
5B	68	27.2	68	0.0	5B	67	27.2	67	0.0

Stage 2C Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	58	70	0.3	1A	67	58	68	0.5
1B	70	67.8	72	2.0	1B	67	67.8	70	3.4
2A	63	58.8	64	1.4	2A	61	58.8	63	2.0
2B	63	74.5	75	11.8	2B	61	74.5	75	13.7
3A	65	55.4	65	0.5	3A	63	55.4	64	0.7
3B	68	68.5	71	3.3	3B	67	68.5	71	3.8
4A	65	53.1	65	0.3	4A	63	53.1	63	0.4
4B	68	63.7	69	1.4	4B	67	63.7	69	1.7
5A	65	44.2	65	0.0	5A	63	44.2	63	0.1
5B	68	50.3	68	0.1	5B	67	50.3	67	0.1

Stage 3 Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	58	70	0.3	1A	67	58	68	0.5
1B	70	67.9	72	2.1	1B	67	67.9	70	3.5
2A	63	58.8	64	1.4	2A	61	58.8	63	2.0
2B	63	74.6	75	11.9	2B	61	74.6	75	13.8
3A	65	55.4	65	0.5	3A	63	55.4	64	0.7
3B	68	68.5	71	3.3	3B	67	68.5	71	3.8
4A	65	53.1	65	0.3	4A	63	53.1	63	0.4
4B	68	63.7	69	1.4	4B	67	63.7	69	1.7
5A	65	44.2	65	0.0	5A	63	44.2	63	0.1
5B	68	50.3	68	0.1	5B	67	50.3	67	0.1

Stage 4B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	64.2	71	1.0	1A	67	64.2	69	1.8
1B	70	79.7	80	10.1	1B	67	79.7	80	12.9
2A	63	68.2	69	6.3	2A	61	68.2	69	8.0
2B	63	83	83	20.0	2B	61	83	83	22.0
3A	65	67.3	69	4.3	3A	63	67.3	69	5.7
3B	68	76.8	77	9.3	3B	67	76.8	77	10.2
4A	65	61.7	67	1.7	4A	63	61.7	65	2.4
4B	68	67.5	71	2.8	4B	67	67.5	70	3.3
5A	65	58.4	66	0.9	5A	63	58.4	64	1.3
5B	68	61	69	0.8	5B	67	61	68	1.0

Stage 4A Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	65.4	71	1.3	1A	67	65.4	69	2.3
1B	70	77.1	78	7.9	1B	67	77.1	78	10.5
2A	63	64.6	67	3.9	2A	61	64.6	66	5.2
2B	63	77.8	78	14.9	2B	61	77.8	78	16.9
3A	65	61.7	67	1.7	3A	63	61.7	65	2.4
3B	68	73.2	74	6.3	3B	67	73.2	74	7.1
4A	65	57.2	66	0.7	4A	63	57.2	64	1.0
4B	68	68.1	71	3.1	4B	67	68.1	71	3.6
5A	65	49.3	65	0.1	5A	63	49.3	63	0.2
5B	68	57.9	68	0.4	5B	67	57.9	68	0.5

Stage 4C Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	70	65.4	71	1.3	1A	67	65.4	69	2.3
1B	70	77.1	78	7.9	1B	67	77.1	78	10.5
2A	63	64.6	67	3.9	2A	61	64.6	66	5.2
2B	63	77.8	78	14.9	2B	61	77.8	78	16.9
3A	65	61.7	67	1.7	3A	63	61.7	65	2.4
3B	68	73.2	74	6.3	3B	67	73.2	74	7.1
4A	65	57.2	66	0.7	4A	63	57.2	64	1.0
4B	68	68.1	71	3.1	4B	67	68.1	71	3.6
5A	65	49.3	65	0.1	5A	63	49.3	63	0.2
5B	68	57.9	68	0.4	5B	67	57.9	68	0.5

*Numbers for Stage 2A have changed from the Draft EIS.

construction noise levels would be less than 3 dBA. The following discussion addresses only those receptors with impacts above the 3 dBA CEQR impact threshold.

Stage 1 (4 months) would include site preparation, initial excavation, and installation of excavation supports and work slabs. The telescoping crane, pile drill rig, front end loader, and excavator are the primary noise contributors during this stage. During Stage 1, noise levels at ground level Receptor 2A would increase by 4.2 dBA during Shift 1 and at ground level receptors 2A and 3A by between 3.0 and 5.6 dBA during Shift 2. Noise levels at elevated Receptors 1B, 2B, 3B, and 4B would increase over existing conditions by between 3.9 and 17.1 dBA during Shift 1 and between 4.5 and 19.1 dBA during Shift 2. The impacts at both the ground level and elevated receptors would be marginally noticeable to intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at these receptors would be between 67 and 80 dBA.

Stage 2B (2 months) would include excavation of the distribution chamber. The pneumatic hammer, excavator, and front end loader are the primary noise contributors during this stage. During Stage 2B, the noise analysis indicates that noise levels at ground level Receptor 2A would increase over existing conditions by 3.7 dBA during Shift 2. This increase would be marginally noticeable. Noise levels at elevated Receptors 1B, 2B, and 3B would increase over existing conditions by between 4.2 and 12.2 during Shift 1 and 6.0 and 14.1 during Shift 2. Impacts at the elevated receptors would be marginally noticeable to intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at these receptor locations would be between 65 to 75 dBA.

Stage 2C (6 months) would include slashing and lining of the shaft. The derrick crane, flatbed truck, and concrete truck are the primary noise contributors during this stage. During Stage 2C, the noise analysis indicates that noise levels at elevated Receptor 2B would increase over existing conditions by 8.6 dBA during Shift 1 and 10.3 during Shift 2. These increases would range from marginally noticeable to intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at this receptor location would be between 71 and 72 dBA.

Stage 3 (12 months) would include installation of riser piping and construction of the distribution chamber. The derrick crane, concrete truck, flatbed truck, and front end loader are the primary noise contributors during this stage. During Stage 3, the noise analysis indicates that during Shift 1, noise levels would increase over existing conditions by 9.5 dBA at elevated Receptor 2B. During Shift 2, noise levels would increase over existing conditions by between 3.1 and 11.3 dBA at elevated receptors 1B, 2B, and 3B. These impacts would be marginally noticeable to intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at these receptor locations would be between 70 and 73 dBA.

Stage 4A (12 months) would include installation of distribution pipes and valves, completion of riser/distribution chambers, and installation of other piping. The derrick crane, front end loader, dump truck, flatbed truck, and excavator are the primary noise contributors during this Stage. During Stage 4A, the noise analysis indicates that during Shift 1, noise levels would increase over existing conditions by between 3.3 and 10.1 dBA at elevated Receptors 2B and 3B. During

Shift 2, noise levels would increase over existing conditions by between 3.8 and 11.9 dBA at elevated Receptors 1B, 2B, and 3B. These impacts would be marginally noticeable to intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at these receptor locations would be between 71 and 73 dBA.

Stage 4B (3 months) would include construction of the regulator and valve chambers adjacent to the shaft. The concrete trucks, telescoping crane, backhoe, and jackhammer are the primary noise contributors during this Stage. During Stage 4B, the noise analysis indicates that noise levels at ground level Receptors 2A and 3A would increase by between 3.3 and 4.8 dBA during Shift 1 and between 4.4 and 6.3 dBA during Shift 2. These impacts would be marginally noticeable to readily noticeable. Noise levels at elevated Receptors 1B, 2B, and 3B would increase over existing conditions by between 6.5 and 15.9 during Shift 1 and between 9.0 and 17.9 dBA during Shift 2. The impacts would be readily noticeable to intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at these receptors would be between 65 and 79 dBA.

During this stage, shaft construction activities may occur concurrently with construction of the first stage of water mains with venturi chamber. As presented in Table 7-12.3 and Table 5.12-6, the noise analyses show that the noise produced by the water main construction activities would be dominant. Increases in noise levels at nearby receptors can be expected to be equal to the noise levels predicted for the first stage of the water main with venturi chamber. These noise levels would be expected to last for 20 weeks.

Stage 4C (2 months) would include site clean-up and restoration. The front end loader, dump truck, and flatbed truck are the primary noise contributors during this Stage. During Stage 4C, the noise analysis indicates that noise levels would increase over existing conditions at elevated Receptor 2B by 7.1 dBA during Shift 1 and by 8.8 during Shift 2. These impacts would be readily noticeable. The total construction ambient noise levels (construction source plus baseline ambient) at this receptor location would be 70 dBA.

In addition to the potential noise impacts identified above, additional floors of the identified affected receptors could be impacted. Furthermore, impacts would extend to additional receptors locations beyond those modeled. During several stages of construction, it is estimated that potential noticeable noise impacts could extend to the backs of several buildings located between the Shaft Site and First Avenue and to buildings located along E. 61st Street between the Shaft Site and midblock to First Avenue. No additional ground level receptors would be affected beyond those identified above.

Potential Noise Impacts – Peak Period Analysis

The peak period analysis shows that incremental noise levels from construction would be greater than 3 dBA for all stages of construction with the exception of Stage 2A. Impacts would occur at Receptors 1, 2 and 3 and Receptor 4 (see Figure 6.12-2 for a map of the receptor sites). Elevated receptors 1B, 2B, 3B, and 4B are more likely to exceed the 3 dBA CEQR threshold than ground level receptors, which would be protected by the Site's concrete wall. Noise levels at elevated Receptor 4 would exceed 3 dBA only during both shifts of Stage 1. At all locations further from the construction site, the estimated construction noise levels would be less than 3 dBA. The following discussion addresses only those receptors with impacts above the 3 dBA CEQR impact threshold. Note that no impacts are expected during Stage 2A, which consists of the raise bore operations. During a few days of this stage, additional equipment including a front end loader, dump truck, flatbed truck, derrick crane, welder, and saw would be used to support the raise bore operations such as pilot hole drilling activities. During these few days, noise levels would be somewhat higher than those presented, up to 9.7 dBA.

Stage 1 (4 months) would include site preparation, initial excavation, and installation of excavation supports and work slabs. The pile drill rig, excavator, and front end loader are the primary noise contributors during this Stage. During Stage 1, the noise analysis indicates that noise levels at ground level Receptor 2A would increase by 5.0 dBA during Shift 1 and at ground level Receptors 1A, 2A, and 3A by between 3.9 and 6.4 dBA during Shift 2. Noise levels at elevated Receptors 1B, 2B, 3B, and 4B would increase over existing conditions by 5.6 and 18.6 dBA during Shift 1 and between 6.3 and 20.5 dBA during Shift 2. These impacts would be marginally noticeable to highly intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at these receptors would be between 67 and 82 dBA.

Stage 2B (2 months) would include excavation of the distribution chamber. The front end loader and rock drill are the primary noise contributors during this Stage. During Stage 2B, the noise analysis indicates that noise levels at ground level Receptor 2A would increase by 4.7 dBA during Shift 1 and at ground level Receptors 2A and 3A by between 3.5 and 6.1 dBA during Shift 2. Noise levels at elevated Receptors 1B, 2B, 3B, and 4B would increase over existing conditions by between 3.4 and 14.0 dBA during Shift 1 and by between 3.9 and 15.9 dBA during Shift 2. These impacts would be marginally noticeable to intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at these receptors would be between 66 and 78 dBA.

Stage 2C (6 months) would include slashing and lining of the shaft. The derrick crane and concrete trucks are the primary noise contributors during this Stage. During Stage 2C, the noise analysis indicates that noise levels would increase over existing conditions at elevated Receptors 2B and 3B by between 3.3 and 11.8 dBA during Shift 1 and at elevated Receptors 1B, 2B, and 3B by between 3.4 and 13.7 dBA during Shift 2. These increases would range from marginally noticeable to intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at this receptor location would be between 70 and 75 dBA.

Stage 3 (12 months) would include installation of riser piping and construction of the distribution chamber. The derrick crane and concrete trucks are the primary noise contributors during this Stage. During Stage 3, the noise analysis indicates that during Shift 1, noise levels would increase over existing conditions at elevated Receptors 2B and 3B by between 3.3 and 11.9 dBA. During Shift 2, noise levels would increase over existing conditions at elevated Receptors 1B, 2B, and 3B by between 3.5 and 13.8 dBA. These impacts would be marginally noticeable to intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at these receptor locations would be between 70 and 75 dBA.

Stage 4A (12 months) would include installation of distribution pipes and valves, completion of riser/distribution chambers, and installation of other piping. The front end loader is the primary noise contributors during this Stage. During Stage 4A, the noise analysis indicates that noise levels would increase over existing conditions at ground level Receptor 2A by 3.9 dBA during Shift 1 and by 5.2 dBA during Shift 2. At elevated Receptors 1B, 2B, 3B, and 4B noise levels would increase by between 3.1 and 14.9 dBA during Shift 1 and by between 3.6 and 16.9 dBA during Shift 2. These impacts would be marginally noticeable to intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at these receptor locations would be between 66 and 78 dBA.

Stage 4B (3 months) would include construction of the regulator and valve chambers adjacent to and on the eastern side of the shaft. The concrete trucks and backhoe are the primary noise contributors during this Stage. During Stage 4B, the noise analysis indicates that noise levels at ground level Receptors 2A and 3A would increase by between 4.3 and 6.3 dBA during Shift 1 and by between 5.7 and 8.0 dBA during Shift 2. These impacts would be marginally noticeable to readily noticeable. Noise levels would increase over existing conditions at elevated Receptors 1B, 2B, and 3B by between 9.3 and 20.0 dBA during Shift 1 and at elevated Receptors 1B, 2B, 3B, and 4B by between 3.3 and 22.0 dBA during Shift 2. The impacts would be readily noticeable to highly intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at these receptors would be between 69 and 83 dBA.

Stage 4C (2 months) would include site clean-up and restoration. The front end loader and dump truck are the primary noise contributors during this Stage. During Stage 4C, the noise analysis indicates that noise levels at ground level Receptor 2A would increase over existing conditions by 3.9 dBA during Shift 1 and by 5.2 dBA during Shift 2. These impacts would be marginally noticeable. Noise levels at elevated Receptors 1B, 2B, 3B, and 4B would increase over existing conditions by between 3.1 and 14.9 dBA during Shift 1 and 3.6 and 16.9 dBA during Shift 2. Impacts at the elevated receptors would be marginally noticeable to intrusive. The total construction ambient noise levels (construction source plus baseline ambient) at these receptor locations would be between 66 and 78 dBA.

In addition to the potential noise impacts identified above, additional floors of the identified affected receptors could be impacted. Furthermore, impacts would extend to additional receptors locations beyond those modeled. During several stages of construction, it is estimated that potential noticeable noise impacts could extend to the backs of several buildings located between the Shaft Site and First Avenue and to buildings located along E. 61st Street between the Shaft Site and midblock to First Avenue. No additional ground level receptors would be affected beyond those identified above.

Potential Noise Impacts-Surface Excavation Method

Under the surface excavation method, the shaft would be constructed from the surface downward. In contrast to the raise bore method, where most of the work to excavate the shaft and distribution chamber would occur underground, under the surface excavation method, this work would occur at the surface of the site. Only Stage 2 would be different between the two methods; Stages 1, 3, and 4 would be similar.

In addition to longer periods of blasting, as discussed above, the surface excavation method would require longer periods of controlled drilling and other excavation techniques to create the shaft from the surface level (24 months under the surface excavation method for Stage 2 as compared to 11 months under the raise bore method).

Heavier, and potentially louder, construction activities and equipment would be required during Stage 2 to excavate and move the heavy rock out of the shaft to the surface. The excavator, derrick crane and dump trucks would be used more extensively for longer hours as indicated in the average period equipment utilization tables in Appendix 12. In addition, a diesel compressor would likely be required on-site. During this Stage, the peak hour noise levels generated by construction equipment would be comparable to the raise bore method because similar types of equipment would be used, but the equipment would be used for a greater number of hours and the duration of noise impacts would be longer on a given day. In addition, noise levels would also be expected to be higher due to the higher level of construction activity associated with moving rock at the surface, rather than below ground.

The excavated soil and rock would be removed from the site by trucks for the entire shaft excavation during Stage 2. In addition to the trucks arriving at and departing from the site each day bring materials, including concrete, an additional 5 to 10 trucks per day would haul away excavated rock from the site during Stage 2 using surface excavation. However, the total number of trucks in Stage 2 would not result in a doubling of passenger car equivalents (PCEs) in the vicinity of the site during the peak hour and a mobile source analysis is not warranted.

Conclusions

Blasting would result in high instantaneous noise levels. As described in Section 4.12, “Noise,” of Chapter 4, “Preferred Shaft Site,” NYCDEP will implement a number of protective measures during blasting to minimize noise impacts. Blasting would occur over a period of eight months for the raise bore method and 24 months for the surface excavation method and it is highly unlikely that more than one or two blasts would occur on a given day.

During other construction activities at the E. 61st Street Shaft Site, based on the range of analysis conducted, there is the potential for adverse noise impacts during most stages of construction at Receptors 2, and 3 and during some stages of construction at Receptors 1 and 4. Potential adverse noise impacts during average conditions would range from 3.3 dBA to 17.1 dBA during Shift 1 and from 3.1 dBA to 19.1 dBA during Shift 2. Potential adverse noise impacts during peak conditions would range from 3.1 dBA to 20.0 dBA during Shift 1 and from 3.3 dBA to 22.0 dBA during Shift 2. Receptor 2 would experience the greatest increase in noise levels during every stage of construction, and floors above the ground floor at this location would experience increases in noise levels ranging from readily noticeable to highly intrusive. Generally, ground floor receptors would be protected by the site’s concrete wall and, with the exception of Receptor 2, the estimated construction noise levels on the ground floors would be either barely perceptible or marginally noticeable.

In addition to the potential noise impacts identified based on the modeling, additional floors of the identified affected receptors could be impacted. Furthermore, impacts would extend to additional receptors locations beyond those modeled. During several stages of construction, it is estimated that potential noticeable noise impacts could extend to the backs of several buildings located between the Shaft Site and First Avenue and to buildings located along E. 61st Street between the Shaft Site and midblock to First Avenue. No additional ground level receptors would be affected beyond those identified above.

If surface excavation were to be used, the peak hour noise levels during Stage 2 generated by construction equipment would be comparable to the raise bore method because similar types of equipment would be used, but the equipment would be used for a greater number of hours and the duration of noise impacts would be longer on a given day. In addition, noise levels would also be expected to be higher due to the higher level of construction activity associated with moving rock at the surface, rather than below ground.

Due to the extended duration that potential noise impacts could occur throughout the construction period, these impacts are considered to be significant. Section 5.12, "Noise," of Chapter 5, "Water Main Connections," discusses the temporary noise impacts generated by construction of the water main connections and venturi chambers. In the event of concurrent construction of the shaft, water main connections, and venturi chambers no additional receptors would experience potential significant adverse impacts, but the receptors that are in the immediate vicinity of both construction projects would experience higher noise levels than they would experience if only the shaft would be constructed for the relatively short time (20 weeks) that both construction projects were under way at the same time.

These conclusions are based on the increases and duration of the noise levels due to the construction activities at the Shaft Site. The potential increases in noise levels are not permanent environmental changes and no changes in the noise levels will occur from this project after it has been constructed. As discussed in Section 7.16, "Mitigation Measures," NYCDEP is exploring potential mitigation measures that could attenuate noise levels at the affected receptors.

Activation and Operation

None of the activities associated with the activation or operation of the shaft would cause potential significant noise impacts, as there would be no loud machinery associated with these activities. Shaft activation would occur for a very short period of time (approximately one month), would not include the use of pumps or other noise-generating equipment, and would require a maximum of one truck delivery per day for a period of approximately three to five days. Due to these short-term and temporary effects, shaft activation would not have the potential to significantly impact noise within the Study Area. All equipment, including pumps and movable valves, associated with operation of the shaft would be located below ground and the facility would be unmanned. Maintenance activities would occur intermittently and generally for not more than a few hours per week. Therefore, no potential significant adverse noise impacts would be expected during activation and operation of the shaft.

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