4.16 MITIGATION MEASURES

4.16.1 Introduction

CEQR and SEQRA require that identified potential significant adverse impacts be minimized or avoided to the fullest extent practicable and that mitigation measures be identified and evaluated in an EIS. Where no mitigation is available, the EIS must disclose the potential for unmitigable significant adverse impacts.

This Section presents mitigation measures for potential significant adverse impacts from construction of Shaft 33B at the preferred Shaft Site. Significant adverse impacts were identified for noise. Potential significant noise impacts would not be fully mitigable. These unavoidable impacts are disclosed in this Section and in Section 4.17, "Unavoidable Adverse Impacts."

4.16.2 Noise

Introduction

As assessed in Section 4.12, "Noise," potential significant noise impacts would be expected to occur during construction at the preferred Shaft Site. This conclusion is based on the increases and durations 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 occur from this project after it has been constructed.

Blasting would result in high instantaneous noise levels. NYCDEP has investigated all feasible protective measures and will be committing to them as part of the project.

During other construction activities at the preferred Shaft Site, based on the range of analysis conducted, there is the potential for adverse noise impacts on the upper floors of the residential apartment located directly across E. 59th Street from the site during all stages with the exception of Stage 2A. Potential adverse noise impacts at this location would range from 3.1 to 11.6 dBA during Shift 1 (7:00 a.m. to 3:00 p.m.) and from 3.1 to 10.7 dBA during Shift 2 (3:00 p.m. to 11:00 p.m.). These impacts would range from marginally perceptible to, at times, intrusive based on the results of the noise modeling and the predicted noise level changes from this project. The apartment building located on the southeast corner of E. 59th Street could also be adversely impacted during all stages with the exception of Stages 2A, 2C, and 3. Potential adverse noise impacts at this location would range from between 3.0 and 10.7 dBA during Shifts 1 and 2, which would range from marginally perceptible to, at times, intrusive. At the lower floors of these receptors, which would be protected by the site's concrete wall, noise levels would generally be low or less than 3 dBA. At all locations further from the construction site, the estimated construction noise levels would be less than 3 dBA.

Based on a through evaluation, NYCDEP is committed to implement a wide range of measures to minimize potential significant impacts, as presented in Section 4.12, "Noise." In general, noise

mitigation measures fall into three categories: source treatments, path treatments and receiver treatments as discussed below.

Source Treatments

Source treatments would include reducing the noise of the construction equipment itself. NYCDEP is committing to using a high quality muffler 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 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. In addition, as per the NYCDEP Tunneling Permit, new noise abatement technologies developed during the course of the contract should be employed. At this time, no other known source treatment measures are anticipated to be practicable and feasible.

Path Treatments

Path treatment measures include sound barriers and enclosures that interrupt the path between the noise source and receiver, thereby reducing noise levels at the receiver. For a sound barrier to be effective, the barrier must be high enough to break the line-of-sight between the receptor and the noise source. Consequently, sound barriers will be most effective in reducing in noise levels in lower level receptors, and less effective for elevated receptors consistent with the analysis results for this EIS.

As part of the project, NYCDEP will construct a prefabricated 20-foot concrete wall around the perimeter of the Shaft Site. The wall will be covered on the inside with a sound absorptive fabric to reduce reflective noise. As explained in Section 4.12, “Noise,” during Stage 4B only, the eastern end of the site would have a 10 foot wall. In addition, since concrete operations during Stages 2C, 3, and 4A are among the noisiest operations, the construction plans for the site will include an acoustical sound enclosure providing 15 dBA attenuation for the concrete mixing trucks.

There is the potential that additional mitigation measures could be implemented during Stage 4B for the short duration of 3 months, which, based on the noise modeling, would produce among the highest noise levels of all construction stages. Stage 4B would include construction of the regulator and valve chambers adjacent to and on the eastern side of the shaft. This work would be conducted by NYCDDC. NYCDEP will work with NYCDDC to ensure that to the extent practicable, noise attenuation measures will be included in NYCDDC’s construction contract when it is issued several years from now. Since the concrete trucks are among the primary noise contributors during this stage, enclosing them in an acoustical sound enclosure providing 15 dBA

attenuation, as will be done for Stages 2C, 3, and 4A for the shaft construction, will substantially reduce noise levels.

Table 4.16-1 presents a comparison of noise levels with and without the 15 dBA acoustical enclosure for Stage 4B at the preferred Shaft Site. As can be seen from the table, for average conditions without the 15 dBA attenuating enclosure, potential significant noise levels at the two affected receptors would range from 3.2 to 8.6 dBA during Shift 1 and from 3.4 to 8.0 dBA during Shift 2. With the 15 dBA attenuating enclosure, potential significant noise levels at the two affected receptors would drop to between 3.1 to 5.9 dBA during Shift 1 and between 3.1 and 5.7 dBA during Shift 2. The 15 dBA enclosure would achieve noise reductions at a number of the affected residences, however, noise level increases would still be above 3 dBA, particularly at elevated receptors located above the height of the site's perimeter wall.

For peak conditions without the 15 dBA attenuating enclosure, potential significant noise levels at the two affected receptors would range from 4.5 to 11.4 dBA during Shift 1 and from 3.2 to 10.7 dBA during Shift 2. With the 15 dBA attenuating enclosure, potential significant noise levels at the two affected receptors would drop to between 3.2 to 6.0 dBA during Shifts 1 and 2. The 15 dBA enclosure would achieve noise reductions at a number of the affected residences, however, noise level increases would still be above 3 dBA, particularly at elevated receptors located above the height of the site's perimeter wall.

In addition, NYCDEP will work with NYCDDC to see whether the wall that would be constructed during Stage 4B within the streetbed of First Avenue could be 20 feet high, as compared to the 10 foot high walls more typically installed for construction projects.

There are a number of other measures that NYCDEP will continue to evaluate to determine whether they can be feasibly implemented at the Shaft Site. These include vinyl/movable curtains to hang in the vicinity of stationary equipment such as pile drilling rigs and cranes. These drapes have certain safety concerns, particularly on a small-scale site, because they limit the line of site for construction workers. In addition, three sided noise tents can reduce noise from certain pieces of equipment such as jackhammers and NYCDEP will further explore their use on the site, where appropriate.

Receiver Treatments

Receiver treatment measures include measures that reduce the noise intensity at the receiver such as building insulation, window treatment, and alternative ventilation. NYCDEP investigated window-wall attenuation to mitigate impacts on affected residences. These measures would include the installing double paned windows on those residences that have only single paned windows; however, many apartment buildings in the areas surrounding the project site already have double paned windows. Apartments without unit air conditioners or central air conditioning could be provided with air conditioning so a closed window condition can be maintained throughout the year to attenuate noise. However, these measures are more practicable for a construction project that would result in permanent increases in noise level impacts. Further, the cost of these measures, lead time for installation, and the uncertainty of negotiating with private property owners may make this potential measure not practicable.

Table 4.16- 1
Comparison of Noise Levels With and Without 15 dBA Acoustical Enclosure

Without 15 dBA enclosure for concrete operations

Average Workday

Stage 4B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	73	69.2	75	1.5	1A	72	69.2	74	1.8
1B	72	72.3	75	3.2	1B	71	72.3	75	3.7
1C	71	72.1	75	3.6	1C	70	72.1	74	4.2
1D	70	75.3	76	6.4	1D	69	75.3	76	7.2
1E	69	76.1	77	7.9	1E	69	76.1	77	7.9
1F	67	74.9	76	8.6	1F	69	74.9	76	6.9
2	73	61.4	73	0.3	2	72	61.4	72	0.4
3A	73	66.8	74	0.9	3A	73	66.8	74	0.9
3B	72	72.8	75	3.4	3B	72	72.8	75	3.4
3C	71	74.1	76	4.8	3C	71	74.1	76	4.8
3D	70	74	75	5.5	3D	70	74	75	5.5
3E	69	73.7	75	6.0	3E	69	73.7	75	6.0
3F	67	73.5	74	7.4	3F	67	73.5	74	7.4
3G	66	73.2	74	8.0	3G	66	73.2	74	8.0
4	73	58.6	73	0.2	4	72	58.6	72	0.2
5A	71	58.6	71	0.2	5A	70	58.6	70	0.3
5B	71	57	71	0.2	5B	70	57	70	0.2
6	71	57.1	71	0.2	6	70	57.1	70	0.2
7	73	67.4	74	1.1	7	73	67.4	74	1.1

Peak Hour

Stage 4B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	73	70.9	75	2.1	1A	72	70.9	74	2.5
1B	72	71.4	75	2.7	1B	71	71.4	74	3.2
1C	71	73.6	76	4.5	1C	70	73.6	75	5.2
1D	70	78.1	79	8.7	1D	69	78.1	79	9.6
1E	69	79.3	80	10.7	1E	69	79.3	80	10.7
1F	67	78.1	78	11.4	1F	69	78.1	79	9.6
2	73	64.3	74	0.5	2	72	64.3	73	0.7
3A	73	70.2	75	1.8	3A	73	70.2	75	1.8
3B	72	76.3	78	5.7	3B	72	76.3	78	5.7
3C	71	77	78	7.0	3C	71	77	78	7.0
3D	70	77	78	7.8	3D	70	77	78	7.8
3E	69	76.7	77	8.4	3E	69	76.7	77	8.4
3F	67	76.5	77	10.0	3F	67	76.5	77	10.0
3G	66	76.3	77	10.7	3G	66	76.3	77	10.7
4	73	62.1	73	0.3	4	72	62.1	72	0.4
5A	71	62.1	72	0.5	5A	70	62.1	71	0.7
5B	71	60.4	71	0.4	5B	70	60.4	70	0.5
6	71	60.5	71	0.4	6	70	60.5	70	0.5
7	73	70.8	75	2.0	7	73	70.8	75	2.0

With 15 dBA enclosure for concrete operations

Average Workday

Stage 4B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	73	67.2	74	1.0	1A	72	67.2	73	1.2
1B	72	71.3	75	2.7	1B	71	71.3	74	3.2
1C	71	70.3	74	2.7	1C	70	70.3	73	3.2
1D	70	72.8	75	4.6	1D	69	72.8	74	5.3
1E	69	72.9	74	5.4	1E	69	72.9	74	5.4
1F	67	71.6	73	5.9	1F	69	71.6	74	4.5
2	73	58.7	73	0.2	2	72	58.7	72	0.2
3A	73	63.5	73	0.5	3A	73	63.5	73	0.5
3B	72	68.1	73	1.5	3B	72	68.1	73	1.5
3C	71	71.2	74	3.1	3C	71	71.2	74	3.1
3D	70	71.1	74	3.6	3D	70	71.1	74	3.6
3E	69	70.9	73	4.1	3E	69	70.9	73	4.1
3F	67	70.6	72	5.2	3F	67	70.6	72	5.2
3G	66	70.4	72	5.7	3G	66	70.4	72	5.7
4	73	55.5	73	0.1	4	72	55.5	72	0.1
5A	71	55.2	71	0.1	5A	70	55.2	70	0.1
5B	71	53.8	71	0.1	5B	70	53.8	70	0.1
6	71	54.2	71	0.1	6	70	54.2	70	0.1
7	73	64.3	74	0.5	7	73	64.3	74	0.5

Peak Hour

Stage 4B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1A	73	64.8	74	0.6	1A	72	64.8	73	0.8
1B	72	65.9	73	1.0	1B	71	65.9	72	1.2
1C	71	68.2	73	1.8	1C	70	68.2	72	2.2
1D	70	72.8	75	4.6	1D	69	72.8	74	5.3
1E	69	72.8	74	5.3	1E	69	72.8	74	5.3
1F	67	71.8	73	6.0	1F	69	71.8	74	4.6
2	73	59	73	0.2	2	72	59	72	0.2
3A	73	64.3	74	0.5	3A	73	64.3	74	0.5
3B	72	67.4	73	1.3	3B	72	67.4	73	1.3
3C	71	71.4	74	3.2	3C	71	71.4	74	3.2
3D	70	71.4	74	3.8	3D	70	71.4	74	3.8
3E	69	71.1	73	4.2	3E	69	71.1	73	4.2
3F	67	70.9	72	5.4	3F	67	70.9	72	5.4
3G	66	70.7	72	6.0	3G	66	70.7	72	6.0
4	73	57.1	73	0.1	4	72	57.1	72	0.1
5A	71	56.7	71	0.2	5A	70	56.7	70	0.2
5B	71	55.1	71	0.1	5B	70	55.1	70	0.1
6	71	55.7	71	0.1	6	70	55.7	70	0.2
7	73	65.7	74	0.7	7	73	65.7	74	0.7

Conclusions

NYCDEP will continue to investigate noise mitigation and attenuation measures and will work with NYCDDC to ensure the implementation of measures during their phase of construction (4B for 3 months) to further reduce noise at the Shaft Site. However, despite a thorough evaluation of measures to reduce noise at the site, noise level increase during construction would be noticeable and significant during the 52 month construction period. Despite noise attenuation measures that have been included as part of the project, and the further investigations that will be conducted to identify other practicable and feasible noise mitigation strategies, potential significant noise impacts at the preferred Shaft Site would remain unmitigated during construction. Typically, noise impacts during construction are not classified as potential significant adverse impacts, but because the construction of Shaft 33B will take 52 months, NYCDEP considers this to be an issue that will be considered in its final decision making.

◆