Chapter 22: Public Health

A. INTRODUCTION

Based on the *New York City Environmental Quality Review (CEQR) Technical Manual* and its coverage of public health issues, an environmental impact statement (EIS) should address public health as it pertains to "the activities that society undertakes to create and maintain conditions in which people can be healthy." Thus, the *CEQR Technical Manual* broadly defines public health and an EIS should therefore address the range of potential issues that could be raised by a proposed action or project. The focus of this chapter is an examination of the potential for adverse impacts on public health from the proposed project, from the perspective of human exposure to ambient air, noise, groundwater, sediment, and soil conditions at the project site.

An assessment of potential public health concerns must consider whether there is a route of exposure to pollutants (i.e., the pollutants have a method of transmission to the human body). Typically, exposure is accomplished by one of three principal pathways: 1) inhalation, 2) ingestion, 3) or dermal absorption. The likelihood or prevalence of these exposure pathways is strongly dependent upon the physical and chemical properties of the contaminants in question as well as the environmental attributes (i.e. soil/fill types, hydrogeologic conditions and other factors). For example, inhalation of air and dust in an affected area represents a complete exposure pathway for contaminants. Exposure pathways to groundwater would not be complete, since it is not used as a drinking water source nor would it be used for irrigation with the proposed project.

PRINCIPAL CONCLUSIONS

As per CEQR guidelines, a screening-level assessment was conducted to determine whether a public health analysis is warranted. The assessment determined that the proposed project would not result in significant adverse impacts related to hazardous materials, groundwater, solid waste management practices that could attract vermin, noise and odors. In addition, construction and operation of the proposed project would not result in significant adverse air quality impacts or public health impacts with respect to emissions of CO, PM_{10} and $PM_{2.5}$, and there would be no significant adverse impacts on the proposed project from nearby existing industrial sources. Nitrogen dioxide (NO_2) concentrations due to emissions from large stationary sources in the area would not be expected to have any significant adverse public health impacts at the project site. At the present time there are not sufficient data and established technical analysis techniques to determine reliably whether concentrations due to emissions from mobile sources in the project study area would be above or below the 1-hour standard in the future with the proposed project condition. However, the traffic associated with the proposed project is not expected to change NO_2 concentrations appreciably, since the vehicular traffic associated with the proposed project would be a very small percentage of the total number of vehicles in the area. The NO_2 emissions associated with equipment that would be used in project construction are typical of emissions at other projects involving large-scale, long-term and intensive construction activities. Exceedances

of the 1-hour NO_2 health-based standard resulting from such activities cannot be ruled out and, as discussed in Chapter 21, "Construction Impacts," certain measures would be implemented by the proposed project in order to minimize emissions from construction activities. The proposed project is not proposing any other actions that would result in significant public health concerns.

B. METHODOLOGY

CEQR GUIDELINES

As stated above, according to the *CEQR Technical Manual*, an EIS public health assessment needs to examine a range of potential issues that are project specific. For the proposed project, this would be related to the potential for public health impacts on future residents and open space users that would be introduced to the site. For determining whether a public health assessment is appropriate, the *CEQR Technical Manual* lists the following as public health concerns for which a public health assessment may be warranted:

- Increased vehicular traffic or emissions from stationary sources resulting in significant adverse air quality impacts;
- Increased exposure to heavy metals (e.g., lead) and other contaminants in soil/dust resulting in significant adverse impacts;
- The presence of contamination from historic spills or releases of substances that might have affected or might affect groundwater to be used as a source of drinking water;
- Solid waste management practices that could attract vermin and result in an increase in pest populations (e.g., rats, mice, cockroaches, and mosquitoes);
- Potentially significant adverse impacts to sensitive receptors from noise or odors;
- Vapor infiltration from contaminants within a building or underlying soil (e.g., contamination originating from gasoline stations or dry cleaners) that may result in significant adverse hazardous materials or air quality impacts;
- Actions for which the potential impact(s) result in an exceedance of accepted federal, State, or local standards; or
- Other actions that might not exceed the preceding thresholds but might, nonetheless, result in significant public health concerns.

C. SCREENING ASSESSMENT

As per CEQR guidelines, a screening-level assessment was conducted to address each of the above-listed public health concerns to determine whether a public health analysis is warranted. The following presents each of the listed public health concerns as they relate to the conclusions of the various technical analyses presented in earlier chapters of this EIS.

INCREASED VEHICULAR TRAFFIC OR EMISSIONS FROM STATIONARY SOURCES RESULTING IN SIGNIFICANT ADVERSE AIR QUALITY IMPACTS

During Construction

As presented in Chapter 21, "Construction," the results of both stationary and mobile source modeling analyses found that the total concentrations of particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}) and carbon monoxide (CO) would not

exceed National Ambient Air Quality Standards (NAAQS). Therefore, no significant adverse impacts from construction sources with respect to these pollutants are expected at the closest sensitive receptors during the peak emission periods. Since the predicted concentrations were modeled for periods that represent the highest site-wide air emissions at the closest sensitive receptors, the increments and total predicted concentrations during other periods of construction and at other locations are also not expected to have any significant adverse impacts.

Dispersion modeling determined that the maximum predicted incremental concentrations of particulate matter with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$) (using a worst-case emissions scenario) would exceed the City's applicable interim guidance criteria at a few receptor locations, where the likelihood of prolonged exposure is very low. The occurrences of elevated 24-hour average concentrations for $PM_{2.5}$ would be very limited in duration. Therefore, after taking into account the temporary nature of construction, the limited duration and extent of these predicted exceedances, and the limited area-wide extent of the 24-hour impacts, it was concluded that no significant adverse air quality impacts for $PM_{2.5}$ are expected from the on-site construction sources.

During Project Operations

The potential for impacts on air quality during the operation of the proposed project was examined in detail and is described in Chapter 19, "Air Quality and Greenhouse Gas Emissions."

The analyses concluded that the proposed project would not result in any significant adverse air quality impacts on sensitive uses in the surrounding community, and the proposed project would not be adversely affected by new or existing sources of air emissions in the project area.

Concentrations of carbon monoxide (CO) and particulate matter less than 10 microns in diameter (PM_{10}) due to project-generated traffic at intersections near the proposed project site (the primary study area) and along main corridors outside the primary study area (the secondary study area) would not result in any violations of NAAQS. It was also determined that CO impacts would not exceed CEQR *de minimis* criteria. Incremental increases in fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) would not contravene the City's current interim guidance criteria. Impacts due to the proposed project's parking facilities were found to result in no significant adverse air quality impacts.

Analysis of the emissions and dispersion of nitrogen oxides (NO_x), CO and PM_{10} from the proposed project's HVAC sources indicates that such emissions would not result in violations of NAAQS. Emissions of $PM_{2.5}$ were analyzed in accordance with the City's current $PM_{2.5}$ interim guidance criteria, which determined that the maximum incremental increases in $PM_{2.5}$ concentrations from stationary sources would be below the significant impact thresholds. To ensure the avoidance of impacts, limitations on annual fuel usage and minimum stack heights would be included in the Restrictive Declaration for the proposed project.

Analysis of the emissions and dispersion of NO_x, CO and PM_{10} from the existing NYPA North 1st Street facility's stationary source indicate that such emissions would not result in the violations of NAAQS. Emissions of $PM_{2.5}$ were analyzed in accordance with the City's current $PM_{2.5}$ interim guidance criteria, which determined that the maximum incremental concentrations of $PM_{2.5}$ from this source on the proposed project would be below the annual significant impact criterion of 0.3 micrograms per cubic meter ($\mu g/m^3$), as well as the 24-hour average interim guidance criterion of 5

$\mu g/m^3$.[1] Maximum 24-hour average $PM_{2.5}$ incremental concentrations from the NYPA facility were predicted to exceed the City's interim guidance criterion of 2 $\mu g/m^3$ at a limited number of locations on elevated receptors on Sites A and B; however, consistent with the City's application of this criteria, based on the magnitude, and the limited frequency and extent of these occurrences, no significant adverse air quality impact is predicted due to emissions of $PM_{2.5}$. To ensure the avoidance of any potential significant adverse impacts, limitations on the placement of operable windows and air intakes would be included in the Restrictive Declaration for the proposed project.

Nearby existing sources from manufacturing or processing facilities were analyzed for their potential impacts on the proposed project. The results of the industrial source analysis demonstrated that there would be no significant adverse air quality impacts on the proposed project.

NO_2

As described in Chapter 19, "Air Quality and Greenhouse Gases," NO_2 concentrations at project buildings due to emissions from large stationary sources in the area would be expected to be below the 1-hour NO_2 standard. Therefore, concentrations due to such emissions would not be expected to have any significant adverse public health impacts at the project site. At the present time there are not sufficient data and established technical analysis techniques to determine reliably whether concentrations due to emissions from mobile sources in the project study area would be above or below the 1-hour standard in the future with the proposed project condition. In addition, exceedances of the 1-hour NO_2 health-based standard resulting from such activities cannot be ruled out. Therefore, a detailed discussion regarding the potential for the proposed project to result in significant adverse impacts from NO_2 emissions is provided following the screening assessment.

INCREASED EXPOSURE TO HEAVY METALS (E.G., LEAD) AND OTHER CONTAMINANTS IN SOIL/DUST RESULTING IN SIGNIFICANT ADVERSE IMPACTS

As discussed in Chapter 12, "Hazardous Materials," based on the environmental studies conducted at the project site, it has been concluded that there would be no anticipated significant adverse impacts associated with the proposed project with respect to hazardous materials.

Hazardous materials would be appropriately addressed prior to or during the demolition of the on-site buildings, including abatement of identified asbestos-containing materials, which would be removed prior to demolition.

Site investigation activities did reveal the presence of semi-volatile organic compounds and metals in the site subsurface associated with historic fill material, but the presence of these compounds does not pose a significant adverse impact to human health or the environment.

Pursuant to the Restrictive Declaration recorded against the property, development activities, including any remediation, will be conducted in accordance with the New York City Department of Environmental Protection (DEP)-approved Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP) under the oversight of DEP and/or the New York City Mayor's Office of Environmental Remediation (NYCOER). This would avoid any significant adverse impacts to construction workers, the surrounding community, and other site occupants. The RAP

[1] One $\mu g/m^3$ is one one-millionth of a gram in one cubic meter.

and CHASP outline procedures for removal of any storage tanks and management of excavated soil during the construction activities, and requirements for vapor controls and a site cap to prevent future exposure to future occupants of the project site.

Therefore, the proposed project would not result in significant adverse impacts with respect to hazardous materials during or after construction.

THE PRESENCE OF CONTAMINATION FROM HISTORIC SPILLS OR RELEASES OF SUBSTANCES THAT MIGHT HAVE AFFECTED OR MIGHT AFFECT GROUNDWATER TO BE USED AS A SOURCE OF DRINKING WATER

The project site is within the area designated for the Brooklyn Queens Sole Source Aquifer. However, groundwater is not used as a potable water supply in this part of Brooklyn and non-potable use is limited. Potable water in Brooklyn is provided by New York City's public water supply, which comprises a system of upstate reservoirs. During subsurface investigations conducted within the project site, groundwater was encountered between 6 and 24 feet below grade and is anticipated to flow west toward the East River. Subsurface investigations conducted in 2005 encountered groundwater at elevations of 2 to 4 feet above mean sea level (MSL), with the lower elevations occurring near the East River. No significant levels of contaminants were detected in a groundwater sample collected within the project site. Only one VOC (trichloroethylene) and two SVOCs (Bis(2-chloroethylhexyl)phthalate and Di-n-Butyl Phthalate) were detected in groundwater samples collected within the project site. Their concentrations were below the NYSDEC Class GA Ambient Water Quality Standards (drinking water standards).

As described in Chapter 12, "Hazardous Materials," laboratory analysis of additional groundwater samples collected during additional sampling in November 2008 detected Methyl ethyl ketone (MEK) at a concentration that exceeded the NYSDEC Class GA Ambient Water Quality Standards at a sampling location located near the northern end of the project site. Cis 1,2-dichloroethylene (DCE), tetrachloroethene (PCE) and trichloroethene (TCE) were detected at concentrations that exceeded the Class GA standard at a sampling location located at a parking lot upgradiant of the industrial complex. The absence of these VOCs in soil in the vicinity of the wells, and their location indicate these compounds may be attributable to regional groundwater quality, i.e., affected by past industrial/manufacturing operations in the area.

The SVOCs 4-methylphenol, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl) phthalate, chrysene, and ideno(1,2,3-cd)pyrene were detected at concentrations exceeding their respective Class GA standard in groundwater samples collected from three sampling locations. These compounds were detected in the fill materials, and small amounts of fill material can become entrained in the samples, which are not filtered, when agitated by the sampling process. Detected SVOCs may also be attributable to general groundwater quality in the area, which has a history of manufacturing. The SVOC compounds and concentrations detected in groundwater at SB-7 were consistent with the site-wide groundwater quality indicating that the detections are associated with fill material and/or general groundwater quality in the area.

Thirteen metals were detected at concentrations above Class GA standards in the total (unfiltered) groundwater samples. In the filtered samples (dissolved metals analysis), only iron, magnesium, manganese, and sodium were detected above their respective Class GA standards. These results indicate that most of the detections in the total metals analyses are likely due to suspended sediments in the samples. Since the site is in an area that may be tidally influenced,

the magnesium, manganese and sodium detected above Class GA standards in the dissolved metals analyses (filtered samples) are likely attributable to the presence of brackish water. The remaining dissolved metals detected were below the Class GA standards and are typical of groundwater quality in New York City.

The proposed project would not create any new pathway conditions that would result in any increased human exposure to groundwater at the site. In addition, local groundwater will not be used for any purpose including consumption. Thus, there would not be an exposure pathway to groundwater with the proposed project and no public health impacts would be expected.

SOLID WASTE MANAGEMENT PRACTICES THAT COULD ATTRACT VERMIN AND RESULT IN AN INCREASE IN PEST POPULATIONS (E.G., RATS, MICE, COCKROACHES, AND MOSQUITOES)

The proposed project would not engage in any solid waste management practices that could attract vermin and result in an increase in pest populations. As discussed in Chapter 21, "Construction Impacts," construction contracts would include provisions for a rodent (mouse and rat) control program. Before the start of construction, the contractor would survey and bait the appropriate areas and provide for proper site sanitation. During the construction phase, as necessary, the contractor would carry out a maintenance program. Coordination would be maintained with appropriate public agencies. Only U.S. EPA - and NYSDEC-registered rodenticides would be permitted, and the contractor would be required to perform rodent control programs in a manner that avoids hazards to humans, domestic animals, and non-target wildlife.

POTENTIALLY SIGNIFICANT ADVERSE IMPACTS TO SENSITIVE RECEPTORS FROM NOISE OR ODORS

Noise

As described in Chapter 20, "Noise," in terms of CEQR, a significant noise impact occurs when there is an increase in the one-hour equivalent noise level ($L_{eq(1)}$) of between 3 and 5 dBA, depending upon the noise level without the proposed action. In terms of public health, significance is not determined based upon the incremental change in noise level, but is based principally upon the magnitude of the noise level and duration of exposure.

During Construction

As described in Chapter 21, "Construction Impacts," construction of the proposed project would implement measures to control noise sources (i.e., reducing noise levels at the source or during most sensitive time periods) and noise pathways (e.g., placement of equipment, implementation of barriers between equipment and sensitive receptors). Even with these measures, an analysis based on a detailed construction activity and equipment schedule prepared by the applicant determined that the noise levels due to construction activities at a few sensitive receptors, including residential uses, immediately adjacent to the project site are expected to exceed the CEQR impact criteria (i.e., increase by more than 3 dBA comparing the noise levels due to construction activities with existing noise levels). Noise level increases at these impacted locations would reach up to 9.2 dBA during the worst-case construction period, and absolute noise levels would reach the mid to upper 70s dBA. These predicted noise levels would be of limited duration within the day, and the predicted overall changes in noise levels would not be large enough to significantly affect public health. While construction activities would produce noise levels of a magnitude that at times are annoying and intrusive, and would be considered undesirable, construction activities would only occur for a limited number of hours per day, and

for a limited number of days during the entire construction period at any location. Based upon the limited durations of these noise levels at any location, the noise produced by construction activities would not result in a significant adverse public health impact. Almost all of these receptors have double glazed windows and some form of air conditioning (window units, through-wall, or Packaged Terminal Air Conditioners), which would provide substantial attenuation of the incident construction noise and result in acceptable interior noise levels according to CEQR criteria during most times of day. The applicant would make attenuation measures (i.e., upgraded windows and/or an alternate means of ventilation) available to any of the residences that are impacted but do not already have these measures.

During Project Operations

As presented in Chapter 20, "Noise," the traffic generated by the proposed project would not result in any significant adverse noise impacts.

Odors

The proposed project would not result in any sources of odors.

ACTIONS FOR WHICH THE POTENTIAL IMPACT(S) RESULT IN AN EXCEEDANCE OF ACCEPTED FEDERAL, STATE, OR LOCAL STANDARDS

See "NO_2" under "Air Quality," above.

OTHER ACTIONS THAT MIGHT NOT EXCEED THE PRECEDING THRESHOLDS BUT MIGHT, NONETHELESS, RESULT IN SIGNIFICANT PUBLIC HEALTH CONCERNS

The proposed project would not result in any other actions that might result in significant public health concerns.

SCREENING ASSESSMENT CONCLUSIONS

As per CEQR guidelines, the screening-level assessment above was conducted to determine whether a public health analysis is warranted. The assessment determined that the proposed project would not result in significant adverse public health impacts related to hazardous materials, and solid waste management practices that could attract vermin, noise and odors. In addition, construction and operation of the proposed project would not result in significant adverse air quality impacts or public health impacts with respect to emissions of CO, PM_{10}, and $PM_{2.5}$, and there would be no significant adverse impacts on the proposed project from nearby existing industrial sources. Nitrogen dioxide (NO_2) concentrations due to emissions from large stationary sources in the area would not be expected to have any significant adverse public health impacts at the project site. At the present time there are not sufficient data and established technical analysis techniques to determine reliably whether concentrations due to emissions from mobile sources in the project study area would be above or below the 1-hour standard in the future with the proposed project condition, and exceedances of the 1-hour NO_2 health-based standard resulting from construction activities cannot be ruled out Therefore, a detailed discussion regarding the potential for the proposed project to result in significant adverse impacts from NO_2 emissions is provided below. The proposed project is not proposing any other actions that would result in significant public health concerns.

D. DETAILED ASSESSMENT

AIR QUALITY

NO_2

As mentioned in Chapter 19, "Air Quality and Greenhouse Gas Emissions", the primary NAAQS represent levels that have been established by EPA to protect the public health (allowing an adequate margin of safety), including the health of "sensitive" populations such as asthmatics, children, and the elderly. EPA recently established a new 1-hour average NO_2 NAAQS of 100 parts per billion (ppb), effective April 12, 2010, in addition to the current annual standard.

Exposure to ambient concentrations of NO_2 has been linked to adverse effects on human health. According to EPA's *Integrated Science Assessment* (*ISA*) *for Oxides of Nitrogen – Health Criteria (2008)* epidemiologic and controlled human exposure studies, supported by animal toxicology studies, have provided evidence for associations between NO_2 exposure and respiratory effects in asthmatics. The ISA also concluded that at this time, the available evidence on cardiovascular health effects following short-term exposure to NO_2 is inadequate to infer the presence or absence of a causal relationship.

EPA first established NAAQS for NO_2 in 1971, setting both a primary standard and a secondary standard at 0.053 parts per million (equivalent to 53 ppb), averaged annually. Currently there are no areas in the United States that are designated as nonattainment of the annual NO_2 standard. However, it can be expected that some areas could be classified as in nonattainment with the NO_2 1-hour NAAQS in the future.

EPA is required to identify or "designate" areas as attaining or not attaining the new standard by January 2012. These initial designations will be based on the existing monitoring network, which consists of monitors established at community-scale locations[1]. Areas with monitors recording violations of the new standards will be designated nonattainment. EPA has identified only one county in the U.S. (in Illinois) that may be classified as nonattainment based on the existing data, and anticipates initially designating all other areas of the country as "unclassifiable" to reflect the fact that there are insufficient data available to determine if those areas are meeting the revised NAAQS. Additional monitoring stations will be established by 2013, primarily near major roadways, to collect additional data for the purpose of determining whether NYC is in attainment of the 1-hour standard.

Any state with nonattainment areas will be required to develop a State Implementation Plan (SIP) that identifies and implements specific measures to reduce ambient NO_2 concentrations to attain and maintain the new 1-hour NO_2 standard, most likely by requiring further reductions of NO_x emissions from sources.

Due to its effect on ambient ozone and $PM_{2.5}$ concentrations, EPA has promulgated a number of regulations to reduce emissions of NO_x from certain source categories. In addition, states (including New York) that have non-attainment areas for ozone and $PM_{2.5}$ have developed SIPs to document how attainment with the ozone and $PM_{2.5}$ NAAQS will be achieved by specified target dates, and have, as a result, promulgated regulations and put in place various programs at the state and regional

[1] Community-scale monitors are monitors that are located in areas that are generally more than 50 meters from roadways.

levels to achieve additional reductions in emissions from sources of NO_x. For example, Tier 2 standards for light-duty vehicles began to be phased in during 2004, and new NO_x standards for heavy-duty engines are being phased in between 2007 and 2010 model years. Lower NO_x standards for non-road diesel engines, locomotives, and certain marine engines will be phased in throughout the next decade. Current air quality monitoring data reflect only a few years of vehicles entering the fleet that meet these strict NO_x standards. In future decades, as these lower-NO_x vehicles and engines become an increasingly large fraction of in-use mobile sources, large NO_x emission reductions will be achieved. As a result, EPA and New York State anticipate that NO_x emissions, and the ensuing ambient NO_2 concentrations, will continue to decrease in the future.

As discussed in Chapter 19, "Air Quality and Greenhouse Gas Emissions," NO_2 concentrations at project buildings due to emissions from large stationary sources in the area would be expected to be below the 1-hour NO_2 standard. Therefore, concentrations due to such emissions would not be expected to have any significant adverse public health impacts at the project site.

At the present time there is not sufficient data and established technical analysis techniques to determine reliably whether concentrations due to emissions from mobile sources in the project study area would be above or below the 1-hour standard in the future with the proposed project condition.

With regard to mobile source emissions, if future monitoring results in the identification and designation of non-attainment areas due to transportation sources, SIP strategies to reduce the 1-hour NO_2 concentrations would be developed. These steps may include additional regulations to further reduce emissions from sources of NO_2 that may contribute to exceedances near roadways. In addition, at the federal level, regulations have been recently promulgated that will increase fuel efficiency standards for vehicles in the future, which will reduce tailpipe emissions of NO_x and other pollutants.

Exceedances of the 1-hour NO_2 standard resulting from project-related construction activities cannot be ruled out. As noted in Chapter 19, "Air Quality and Greenhouse Gas Emissions," the NO_2 emissions associated with the combustion equipment that would be used in construction of the proposed project are typical of emissions associated with construction activities involving similar equipment at other projects involving large-scale, long-term and intensive construction activities.

As discussed in Chapter 21, "Construction Impacts," certain measures would be implemented by the proposed project in order to minimize emissions from construction activities. Those measures would include the use of electric engines and grid power where practicable, and other measures for generally reducing pollutant emissions. In addition, to minimize hourly emissions of NO_2 to the maximum extent practicable, non-road diesel powered vehicles and construction equipment meeting or achieving the equivalent of the EPA Tier 3 Non-road Diesel Engine Emission Standard would be used in construction, and construction equipment meeting Tier 4 would be used where conforming equipment is widely available for use in New York City, and the use of such equipment is practicable[1]. ✶

[1] The first federal regulations for new nonroad diesel engines were adopted in 1994, and signed by EPA into regulation in a 1998 Final Rulemaking. The 1998 regulation introduces Tier 1 emissions standards for all equipment 50 hp and greater and phases in the increasingly stringent Tier 2 to Tier 3 standards for equipment manufactured in 2000 through 2008. In 2004, The EPA introduced Tier 4 emissions standards with a phased-in period of 2008 to 2015. The Tier 1 through 4 standards regulate the EPA criteria pollutants, including particulate matter (PM), hydrocarbons (HC), oxides of nitrogen (NO_x) and carbon monoxide (CO). Prior to 1998, emissions from nonroad diesel engines were unregulated. These engines are typically referred to as Tier 0.