Appendix N
Noise Evaluation

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NOISE EVALUATION

INTRODUCTION

Noise is typically defined as unwanted or undesirable sound. The basic parameters of environmental noise that affect human subjective response are (1) intensity or level, (2) frequency content, and (3) variation with time. Intensity of sound is expressed using a logarithmic scale in units of decibels (dB). By using this scale, the range of normally encountered sound can be expressed by values between 0 and 120 decibels. On a relative basis, a 3-dB change in sound level generally represents a barely noticeable change, whereas a 10-dB change in sound level would typically be perceived as a doubling (or halving) the loudness of a sound.

The frequency content of noise is related to the tone or pitch of the sound and is expressed based on the rate of the air pressure fluctuation in terms of cycles per second (called Hertz and abbreviated as Hz). The human ear can detect a wide range of frequencies from about 20 Hz to 17,000 Hz. However, because the sensitivity of human hearing varies with frequency, the "A-weighting system" is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called A-weighted sound levels and are expressed in decibel notation as dBA. Throughout this document, all sound levels are expressed with dBA weighting. Examples of A-weighted sound pressure levels are presented in the table below.

Examples of Common Sounds: A-weighted Sound Level in Decibels (dBA)

A-Weighted Noise Level	Overall Level	Noise Environment
120	Uncomfortably loud (32 times as loud as 70 dBA)	Military jet airplane takeoff at 50 feet
100	Very loud (8 times as loud as 70 dBA)	Jet flyover at 1,000 feet Locomotive pass-by at 100 feet
80	Loud (2 times as loud as 70 dBA)	Propeller plane flyover at 1,000 feet Diesel truck traveling 40 miles per hour at 50 feet
70	Moderately loud	Freeway at 50 feet from pavement edge at 10:00 AM Vacuum cleaner (indoor)
60	Relatively quiet (1/2 as loud as 70 dBA)	Air conditioning unit at 100 feet Dish washer at 10 feet (indoor)
50	Quiet (1/4 as loud as 70 dBA)	Large transformers Small private office (indoor)
40	Very quiet (1/8 as loud as 70 dBA)	Birds calls Lowest limit of urban ambient sound
10	Extremely quiet	Just audible (1/64 as loud as 70 dBA)
0		Threshold of hearing

Source: Federal Interagency Committee on Noise (1992)

Because environmental noise fluctuates from moment to moment, it is common practice to condense all this information into a single number, called the "equivalent" sound level (Leq). Leq can be thought of as the steady sound level (or average sound level) that represents the same sound energy as the varying sound levels over a specified period. In this report, Leq(h) is used to refer to the Leq sound level over a period of one hour.

Typical noise emission levels from construction equipment were derived from the Federal Highway Administration Roadway Construction Noise Model (RCNM), and construction noise levels were modeled with the RCNM. The model calculates noise by using empirical data for noise generated by construction equipment, mathematical formulae relating noise attenuation with distance, and information regarding the percentage of time that a certain piece of equipment is expected to be operated at maximum power while on-site during construction. The results of the noise model were used as a basis to evaluate potential construction-related noise levels at receptor locations in the vicinity of construction activities.

PROJECT CONSTRUCTION NOISE

Construction activity would occur in the vicinity of noise-sensitive receptors, including wildlife, residential receptors, and park users.

Excavation would require heavy construction equipment such as excavators and/or backhoes, cranes, delivery trucks, and other equipment. For most project components, the loudest equipment would be jackhammers (88 dBA) and concrete trucks (85 dBA). For Smith Pond, sonic (vibratory) pile driving would be the loudest activity (95 dBA) (FTA 2018). The elevated noise levels would be present in areas of active construction activity, and no one area would experience these noise levels for the duration of the construction period.

The temporary increases in noise levels during construction would be mitigated by complying with local noise ordinances. Town of Hempstead prohibitions limit most construction activities to between 7:00 AM and 6:00 PM on weekdays and require use of mufflers on generators and motor vehicles (Town of Hempstead Code 144-3). The Village of Rockville Centre and Village of East Rockaway limit construction activities to between 8:00 AM and 7:00 PM (Village of Rockville Centre Code 232-7; Village of East Rockaway Code 194-2). The Village of East Rockaway also limits the continuous sound-in-air level at or across a real property boundary exceeds an L10[1] of 80 dB(A). Contractors would be required to demonstrate compliance with these noise ordinances. Therefore, no significant noise impacts would occur.

The behavioral response of waterfowl to noise stimuli appears to depend on the species, the intensity of the stimuli, and the ambient or background noise conditions. Some species of waterfowl have been accustomed to sensory stimuli that they do not perceive as threatening (Port Authority of New York and New Jersey 2004). At the individual level, physiological and behavioral responses of animals to anthropogenic noise generally include increased acute stress levels, increased heart rates, and fleeing from the source of the noise. However, such responses are usually in response to novel, newly introduced disturbances, and animals often gradually habituate to and tolerate loud noises after initial exposure (Bowles 1995). Sufficient natural area exists near the project component sites to accommodate the temporary displacement of wildlife that may be disturbed by construction activity.

[1] L10 is the noise level exceeded for 10 percent of the time of the measurement duration.

The noisiest part of the construction period is likely to be excavation and site preparation, while crews operate an excavator, backhoe, dump trucks, and flatbed trucks.

Operational Noise

The Living with the Bay Stormwater Project involves stormwater improvements that do not include new development that would generate increased noise on the component sites. Most project components would not generate operational noise, with the exception of the emergency generator that would be installed in an existing alcove area on the rear property of the East Rockaway High School near the existing interior electrical room and adjacent to an existing generator that provides power to the school sump pump system. The policies of 24 Code of Federal Regulations 51.101(a)(3) do not apply to any action or emergency assistance under disaster assistance provisions or appropriations that are provided to save lives and protect public health and safety. As such, these policies do not apply to the proposed generator, which would operate to protect the school and public health.

Conclusion

Given that the operation of the proposed project would not generate noise, and that construction of the proximate human receptors would comply with local noise ordinance, and animals in the vicinity of construction activity could avoid disrupting noise by migrating to similar habitat nearby, no adverse noise impacts are expected.

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