Chapter 6.1: Impacts During Construction

A. INTRODUCTION

The proposed project is a multi-year project for three large watersheds that cover approximately 5,000 acres of the Mid-Island area of Staten Island. The proposed project includes the following: 44 miles of new sewers, five proposed BMPs and one new outfall to Lower Bay in Oakwood Beach; about 57 miles of new sewers, 19 BMPs and one new outfall to Lower Bay in New Creek; and about 36 miles of sewers, three BMPs and one new outfall to the Lower Bay in South Beach. Given the magnitude of the infrastructure improvements under the proposed amended drainage plans, it is expected that the proposed project would be implemented through multiple capital projects that would continue through the year 2043, when full build out of the proposed amended drainage plans is projected to be complete. This analysis describes typical Bluebelt construction practices and identifies environmental protection measures that would be implemented in all capital projects as part of the proposed project during construction.

B. PROJECT PHASING

Construction activities under the proposed amended drainage plans are expected to take several decades. Multiple capital projects in each watershed would be necessary to fully implement the proposed amended drainage plans. Current project planning assumes that the first proposed capital projects would commence in fiscal year 2014 and would involve the relocation and improvement of the West Branch of the New Creek watershed, along with the related sewer work (NC-7 through NC-10, and NC-17; see below description).

DEP is in the process of developing a more detailed phasing program for each of the Mid-Island watersheds. This phasing and progression of construction is based on the underlying principle of beginning construction in the lower watershed first and moving to the upper watershed second, since the upper watershed cannot be built without a functioning lower watershed drainage system designed and built as per the proposed amended drainage plan. A phased construction program also allows the City to monitor construction activities and minimizes road closures and access restrictions. A summary of the anticipated phasing in each watershed is provided below.

- Oakwood Beach: BMP OB-1, Kissam Avenue, its accompanying bay outfall, and OB-2 would be constructed as one construction phase. Once complete, work on OB-3 and OB-4 would proceed. BMP OB-3 would be constructed concurrently or before BMP OB-4, since OB-3 serves at the outlet for OB-4. Since OB-5 is in a separate subdrainage area of the watershed, construction phasing can be independent of these BMPs.
- New Creek, West Branch: Improvements in the West Branch have been identified for the first capital projects at the proposed sites of BMPs NC-7, -8, -9, -10 and -17 (altogether, or in some combination). Capital projects would then proceed upstream.
- New Creek, East Branch: BMP NC-18 would be built first, to allow the relief sewer from Seaview Avenue to be built. This would be followed by BMP NC-19.

- New Creek Main Channel: Capital projects along the Main Channel are expected to begin with BMP NC-16 and then proceed upstream to BMPs NC-15, -14, -13, and -12.
- New Creek: BMPs NC-6 and NC-11, which are located at the headwaters of the West Branch and Main Channel of New Creek, respectively, would provide critical upstream storage. Phasing for these sites is being further evaluated based on their role in the overall hydrology of the lower watershed, recognizing that relocation and improvements along the West Branch are a priority.
- New Creek: BMPs NC-1 through NC-5 and associated storm sewers are separate subdrainage areas and could be constructed at any point.
- South Beach: The recommended construction sequence would be to build the SBE-1A, -1B and -1C as one phase. Once complete, the tributary storm sewer network would be completed. Because the upper watershed BMPs are essentially separate drainage areas and independent of the lower watershed BMPs, construction of these BMPs could proceed at any time.

Future construction phasing for the proposed project will be based on the recording of an amended drainage plan, availability of capital funds (e.g., a typical capital project is between $15 and $20 million), sequence and size of individual projects and coordination with the New York City Department of Transportation (DOT) (e.g., street reconstruction closures, etc.). Because the proposed project is currently in the planning phase and the subject of a GEIS, specific construction phasing details are not known at this time. However, generic information on general construction phasing, construction phasing for each watershed, typical construction activities (e.g., typical outfall and BMP construction) and probable impacts during construction is presented below based on the current proposed BMP conceptual designs presented in this DGEIS and a reasonable worst case impact scenario for the proposed BMPs.

C. GENERAL CONSTRUCTION PRACTICES

Tables 6.1-1 through **6.1-3** present each of the proposed BMPs and the typical construction activity in each watershed for each BMP. Provided below is a description of the environmental protection measures, construction practices and environmental controls that would be implemented during project construction.

DEWATERING

Certain construction activities, including sewer and BMP installation in areas of shallow groundwater, are expected to require dewatering activities so that work can be performed without groundwater inundating the work area. Discharge points for the residual water from the dewatering operations may be a City sanitary line or local surface waters, both of which would require permit approvals from DEP and NYSDEC, respectively.

The type of dewatering technique employed would be dependent upon the amount of groundwater needing to be pumped and the location of the proposed construction activity. Typically, the contractor would install a series of well points and pumpouts. In low-pump rate situations, a single line would be placed in the trench. Contractors would be required to convey pumped-out residual water through settling devices, such as sediment traps or portable sediment tanks, prior to discharge. Sediment tanks allow suspended solids to settle out before discharge. The captured sediments from the bottom of the tanks would be regularly removed by the contractor.

Table 6.1-1
Oakwood Beach Proposed BMP Construction Activities

BMP (Property)	Description	Project Site Size (acres)	Extent of Disturbance and General Construction Activities
OB-1: Kissam Avenue (DEP/DPR)	Extended Detention Wetland	28.2	Clearing and grading for the permanent pool, extended detention, weir and forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade. Post grading and installation of BMP structures, there would be final grading, with planting of BMP vegetation.
OB-2: Tysens Lane (DPR)	Extended Detention Wetland	27.9	Clearing and grading for the permanent pool, extended detention, weir and forebays. Grading would generally be to a depth of 3-5 feet below existing grade. Post grading and installation of BMP structures, there would be final grading, with planting of BMP vegetation.
OB-3: Riga Street (DEP)	Extended Detention Wetland	29.0	Clearing and grading for the permanent pool, extended detention, weir and forebays. Grading would generally be to a depth of 3-5 feet below existing grade. Post grading and installation of BMP structures, there would be final grading, with planting of BMP vegetation.
OB-4: Ithaca Street (DEP)	Outlet Stilling Basins / Stream Stabilization	1.4	Clearing and grading to create the proposed new stream and extended detention with forebays at the sewer outlets. Affected area for new channel about 30 feet wide and 600 feet long. Final land-scaping and grading.
OB-5: North Railroad Avenue (NYSDOT/DPR)	Stormwater Basin Retrofit and Channel Restoration	3.2	Clearing and grading to retrofit the existing stormwater basin and create the downstream stream channel. Affected area for channel restoration about 30 feet wide and 300 feet long. Final landscaping and grading.
Lower Bay Outfall (DEP/DPR)	Storm sewer outfall to Raritan Bay	2.0	Clearing and excavation as part of outfall installation (proposed outfall about 10 feet in width, work area potentially about 35 feet in width). Construction activities would cross uplands and extend into tidal wetlands within Raritan Bay thereby requiring tidal wetland mitigation.
Notes: DPR=New York City Department of Parks and Recreation			

Table 6.1-2
New Creek Proposed BMP Construction Activities

BMP (Property)	Description	Project Site Size (acres)	Extent of Disturbance and General Construction Activities
NC-1: Merrick Avenue (DPR)	Velocity Attenuator/stream bank stabilization	0.1	Clearing and grading for the proposed velocity attenuator with stream bank stabilization below the outlet stilling basin. Bank stabilization would involve minor grading and the installation of stabilization measures such as check dams and rock toe plantings. After installation of BMP structures, there would be final landscaping. Limited tree clearing and replanting.
NC-2: Ocean Terrace (DPR)	Velocity Attenuator/drop pipe/stream bank stabilization	0.1	Clearing and grading for the proposed velocity attenuator with stream bank stabilization below the outlet stilling basin. Bank stabilization would involve minor grading and the installation of stabilization measures such as check dams and rock toe plantings. After installation of BMP structures, there would be final landscaping and final finishes. Limited tree clearing and replanting.
NC-3: Annfield Court (DPR)	Extended Detention Wetland	0.3	Clearing and grading for the permanent pool, extended detention, weir and forebays. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of BMP structures, there would be final grading, with planting of BMP vegetation and final finishes. Limited tree clearing and replanting.

Table 6.1-2, cont'd
New Creek Proposed BMP Construction Activities

BMP	Description	Project Site Size (acres)	Extent of Disturbance and General Construction Activities
NC-4: Whitlock Avenue (NYSDEC)	Detention Chamber/ Extended Detention	0.3	Clearing and grading for the permanent pool, extended detention, weir and forebays. Grading would generally be to a depth of 3-5 feet below existing grade. Excavation and installation of the proposed detention chamber. After grading and installation of BMP structures, there would be final grading for planting of BMP vegetation and final finishes. Limited tree clearing.
NC-5: Todt Hill Road (NYSDEC)	Extended Detention	0.8	Clearing and grading for the permanent pool, extended detention, weir and forebays. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of BMP structures, there would be final grading for planting of BMP vegetation and final finishes. Limited tree clearing.
NC-6: Boundary Avenue (DPR)	Extended Detention Wetland	3.0	Clearing and grading for the permanent pool, extended detention, weir and forebays. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of BMP structures, there would be final grading, with planting of BMP vegetation and final finishes. Substantial tree clearing in DPR parkland.
NC-7: Nugent Avenue (DEP Bluebelt)	Extended Detention Wetland/Stream Realignment/ Floodplain Restoration	4.7	Clearing and grading for the realigned stream permanent pool, extended detention, weir, forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of BMP structures, there would be final grading, with planting of BMP vegetation and final finishes. Tree clearing in DPR parkland.
NC-8: Freeborn Street (DEP Bluebelt)	Stream Realignment/ Extended Detention Wetland/Floodplain Restoration	0.7	Clearing and grading for the realigned stream permanent pool, extended detention, weir, forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade along the stream segment. After grading for installation of BMP structures, there would be final grading for planting of BMP vegetation and final finishes.
NC-9: Graham Boulevard (DEP Bluebelt)	Stream Realignment/ Extended Detention Wetland/Floodplain Restoration	4.4	Clearing and grading for the realigned stream permanent pool, extended detention, weir, forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade along the stream segment. After grading for installation of BMP structures, there would be final grading for planting of BMP vegetation and final finishes.
NC-10: Jefferson Avenue (DEP Bluebelt)	Extended Detention Wetland	4.5	Clearing and grading for the permanent pool, extended detention, weir, forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of for BMP structures, there would be final grading for planting of BMP vegetation and final finishes.
NC-11: Last Chance Pond (DEP Bluebelt & DPR)	Extended Detention Pond/Wetland	8.8	Clearing and grading for the permanent pool, extended detention, weir, forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of for BMP structures, there would be final grading for planting of BMP vegetation and final finishes. Tree clearing in DPR parkland.

Table 6.1-2, cont'd
New Creek Proposed BMP Construction Activities

BMP	Description	Project Site Size (acres)	Extent of Disturbance and General Construction Activities
NC-12: Joyce Street (DEP Bluebelt)	Outlet Stilling Basin	0.1	Limited clearing and grading for the proposed outlet stilling basins. After installation of the BMP structure, there would be final landscaping and final finishes.
NC-13: Hylan Boulevard (DEP Bluebelt)	Extended Detention Wetland	2.9	Clearing and grading for the permanent pool, extended detention, weir, forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of for BMP structures, there would be final grading for planting of BMP vegetation and final finishes. Construction activities in DEP Bluebelt property only.
NC-14: Meadow Place (DEP Bluebelt)	Two Outlet Stilling Basins	0.2	Limited clearing and grading for the proposed outlet stilling basins. After installation of the BMP structure, there would be final landscaping and final finishes.
NC-15: Laconia Avenue (DEP Bluebelt)	Outlet Stilling Basin	0.1	Limited clearing and grading for the proposed outlet stilling basins. After installation of the BMP structure, there would be final landscaping and final finishes.
NC-16: Olympia Boulevard (DEP Bluebelt)	Extended Detention Wetland	12.0	Clearing and grading for the permanent pool, extended detention, weir, forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of for BMP structures, there would be final grading for planting of BMP vegetation and final finishes.
NC-17: Slater Boulevard (DEP Bluebelt)	Stream Realignment/ Extended Detention Wetland/Floodplain Restoration	9.7	Clearing and grading for the permanent pool, extended detention, weir, forebays and berms. After grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of for BMP structures, there would be final grading for planting of BMP vegetation and final finishes.
NC-18: Patterson Avenue (DEP Bluebelt)	Extended Detention Wetland	8.4	Clearing and grading for the permanent pool, extended detention, weir, forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of for BMP structures, there would be final grading for planting of BMP vegetation and final finishes.
NC-19: Buel Avenue (DEP Bluebelt)	Outlet Stilling Basin	0.1	Limited clearing and grading for the proposed outlet stilling basins. After installation of the BMP structure, there would be final landscaping and final finishes.
Lower Bay Outfall (DEP)	Storm sewer outfall to Raritan Bay	0.6	Clearing and excavation as part of outfall installation (proposed outfall about 5 feet in width, work area potentially about 35 feet in width). Construction activities would cross uplands and extend into tidal wetlands within Raritan Bay thereby requiring tidal wetland mitigation.

Table 6.1-3
South Beach Proposed BMP Construction Activities

BMP	Description	Project Site Size (acres)	Extent of Disturbance and General Construction Activities
SBE-1A: Quintard Street (DEP/DPR)	Extended Detention Wetland	18.6	Clearing and grading for the permanent pool, extended detention, weir, forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of BMP structures, there would be final grading for planting of BMP vegetation.
SBE-1B: Sand Lane (DEP)	Extended Detention Wetland	23.2	Clearing and grading for the permanent pool, extended detention, weir, forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of BMP structures, there would be final grading, with planting of BMP vegetation.
SBE-1C: McLaughlin Street (DEP)	Extended Detention Wetland	0.6	Clearing and grading for the permanent pool, extended detention, weir, forebays and berms. Grading would generally be to a depth of 3-5 feet below existing grade. After grading and installation of BMP structures, there would be final grading for planting of BMP vegetation.
SBE-2A: Windermere Road (DEP)	Outlet Forebay (Cameron's Lake)	0.2	Minimal disturbance, excavation at least 2 to 3 feet deep, area affected about 9,000 square feet. Installation of forebay structure and final finishes and plantings. Removal of fill and re-planting wetland at shoreline edge.
SBE-2B: Allendale Road (DEP)	Outlet Forebay (Cameron's Lake)	0.2	Minimal disturbance, excavation at least 2 to 3 feet deep, area affected about 9,000 square feet. Installation of forebay structure and final finishes and plantings. Removal of fill and re-planting wetland at shoreline edge.
SBE-2C: Normalee Road (DEP)	Micropool Outlet/Riser Box (Cameron's Lake)	0.2	Installation of micro-pool and riser box (in water activities). Minimal disturbance (area affected about 9,000 square feet). Final finishes and stabilization of shoreline. Construction activities in Bluebelt property only.
SBE-3: Whitney Woods (DEP)	Extended Detention Wetland	1.2	Clearing and grading to create the intermittent channel and extended detention. Affected area for new channel about 30 feet wide and 300 feet long. Final landscaping and grading..
Lower Bay Outfall (DEP, NYCDOT, DPR)	Storm sewer outfall to Raritan Bay	0.6	Clearing and excavation as part of outfall installation (proposed outfall about 2 feet in width, work area potentially about 35 feet in width). Construction activities would cross uplands and extend into tidal wetlands within Raritan Bay thereby requiring tidal wetland mitigation.

Construction documents for each capital project would include a requirement that contractors must meet specific requirements for the discharge of the dewatered effluent. The requirements would establish a testing procedure to monitor the turbidity of the effluent and to not surpass a maximum turbidity standard. This standard is, in part, based on existing turbidity of the receiving pond or stream. Dewatering activities would also be subject to the requirements of the Industrial Stormwater Pollutant Discharge Elimination System (SPDES) Discharge Permit for temporary dewatering activities that would involve direct discharges to surface waters.

If dewatering into New York City sewers is proposed, a Sewer Discharge Permit must be issued by DEP prior to the start of any dewatering activities at the site. In this case, groundwater sampling to determine compatibility within DEP Sewer Discharge Criteria would need to be

performed in areas where dewatering is expected. Data would be submitted to DEP for review and approval.

All collected sediment would also need to be disposed of in accordance with all City, state, and federal regulations, if testing identifies elevated levels of hazardous materials.

EROSION AND SEDIMENTATION CONTROL

The proposed project would require excavation within City streets as well as clearing and grading at the proposed BMP sites. The areas affected at the BMP sites range in size from 0.1 acres to about 28 acres (see **Tables 6.1-1, 6.1-2** and **6.1-3**). All construction activities would need to be performed in accordance with NYSDEC technical standards for erosion and sediment control and must be implemented in accordance with an approved Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must be in compliance with the NYSDEC SPDES General Permit for Stormwater Runoff from Construction Activity.

Each capital project's SWPPP would describe the specific stormwater management practices to be used in reducing the pollutants in stormwater runoff during construction. The SWPPP also includes a soil, erosion, and sediment control plan in conformance with NYSDEC's "Standard and Specifications for Erosion and Sediment Control" that at a minimum would include, but not be limited to: construction limiting fencing, staked straw bales, reinforced silt fences, sediment traps with filters, sediment filters, portable sediment tanks, storm drain inlet protections, and sandbags, as necessary. With the implementation of these control measures, the proposed project would not contribute runoff pollutants to surface waters.

Under each capital project, work activities and clearing limits would be identified in the construction document. Therefore, no vegetation outside these limits would be disturbed. Also, no stockpiling of excavated material that would cause erosion would be permitted. "Stop work" orders would be issued to the contractor if erosion-control measures are not properly installed and maintained.

Proposed BMP sites would also be used as temporary sediment traps or basins during sewer construction. A temporary sediment trap is a settling area created by constructing an earthen embankment with a stone outlet. The purpose is to capture and detain sediment-laden runoff from small disturbed areas. A temporary sediment basin is a barrier or dam with a controlled stormwater release structure formed by constructing an embankment of compacted soil across a drainage way.

In addition, as part of each capital project's final design documents, DEP would identify additional locations, as appropriate, for the installation of sediment basins outside the proposed BMP locations. In each case, the use of sediment traps, basins, and/or filters would stay in place until construction activity is complete and the ground surface is stabilized. During use, sediment traps require frequent maintenance. Typically, when they are 50 percent or more full, they must be emptied. Silt intercepted by basins and filters must also be removed, especially after storms.

Another important erosion-control measure is temporary seeding or the establishment of a temporary vegetative cover on disturbed areas by seeding with appropriate, rapidly growing annual plants. This measure provides protection to bare soils exposed during construction until permanent vegetation or other erosion-control measures can be established.

During construction, the contractor, in accordance with the SWPPP, would be required to conduct periodic site inspections—at least once per week and after each rainfall of 0.5 inches or

more. The contractor would also need to perform a final site inspection to certify that the site has been stabilized with a final cover using either vegetative or structural stabilization methods, and that all temporary erosion and sediment controls not required for long-term erosion control have been removed. To ensure that the erosion control measures are functioning properly at all times, an allotment item would be established in each contract, providing a fund for maintenance as needed by the contractor, at the direction of the resident engineer.

For the storm sewer segments, only one portion of a street segment—up to one or two blocks in length—is excavated at any one time, rather than opening long segments and leaving soil exposed for extended periods. In addition, once trenches are backfilled, they would be compacted and sealed with a temporary wearing surface, such as gravel or patch asphalt. This reduces the duration of the exposure of excavated areas that are vulnerable to erosion. At the end of each work day, each project segment would be cleaned and swept. These measures would further reduce potential sedimentation in local watercourses and wetlands.

WETLANDS PROTECTIONS

Construction of the proposed BMPs would involve substantial activities within and adjacent to freshwater and tidal wetlands. Measures typically used in Bluebelt projects to minimize disturbance to wetlands during construction include the following:

- Sediment and erosion control practices (described above) would be part of the contract requirements, including specific techniques and methods to control sedimentation and erosion, such as snow fencing and silt fence/surface water collectors along the particularly sensitive segments, as appropriate (discussed above).
- Within wetland areas to be replanted, biodegradable erosion-control matting or jute mesh would be used to stabilize soils during the grow-in period. This matting reduces erosion and sedimentation from the created wetlands to existing wetlands by protecting soil during the period when new wetland plantings are taking root.
- Flagging and marking the edge of wetlands so that construction activities do not inadvertently extend into wetlands not intended for construction or restoration.
- Construction limit fencing would be used to avoid wetland encroachments during construction activities. The fencing would be equipped with signs reading “Protected Wetlands—Construction Prohibited Beyond This Point.” The fencing and hay bales would be maintained for the duration of work in a stretch of street or at a BMP location.
- For construction segments with more intensive construction activities adjacent to wetlands, a reinforced silt fence with a surface water collector would be used. The surface water collector consists of a French drain or trench filled with trap rock. This drain would help to remove water from the street and allow construction to occur in drier conditions. The filter-fabric fence would intercept silt before it enters the adjacent wetland. After construction is complete, the fence would be removed; the trap rock could remain, since it would provide a quality well-drained shoulder for the road.

The proposed project would also require state and federal permits for construction activities in freshwater wetlands. Therefore, it is expected that additional protection measures would be developed during the course of capital project implementation, and permitting that would need to be incorporated into construction specifications and implemented as part of the construction phase.

In addition, the proposed project includes new outfalls to the Lower Bay. In order to protect wetlands and waters from turbidity during construction, the proposed construction program would include techniques to contain re-suspended sediments and ensure that the proposed construction activity does not indirectly affect wetlands or water quality. Among the measures expected to be used are turbidity curtains and cofferdams, which would be installed prior to the start of outfall construction activities. The turbidity curtain would be placed below the mean low water line, to contain re-suspended sediments when in-water construction commences. A cofferdam would be used with dewatering pumps to remove water within the construction area before excavation. The cofferdam would therefore provide a physical barrier between the work area and the water body. In addition, containment booms may be used to control floatables generated during construction. Construction of each of the proposed outfalls would also require a wetland and water quality protection permit from NYSDEC and USACE. These and other protection measures identified during the permit review process with these agencies would be implemented as part of the proposed project and would therefore be required as per the permit and implemented during construction.

HAZARDOUS MATERIALS

The proposed project would involve the disturbance of soil and groundwater in areas where prior uses and regulatory database searches have indicated a potential for the presence of hazardous materials in the soil and/or groundwater. At some BMP locations, this conclusion is based on Phase II testing. In other locations, additional site testing may be necessary. At all sites where the proposed project may disturb contaminated soil or groundwater, the proposed project would implement a Construction Health and Safety Program (CHASP) and Remedial Action Plan (RAP). In addition, all excavated soil would need to be handled and managed in accordance with all City, state, and federal regulations. If any dewatering is necessary during construction and discharge to sanitary sewers is proposed, the residual water would need to meet DEP standards for discharge to a City sanitary line and pretreatment would need to be performed as necessary (see above). If residual water is proposed to be discharged to a stream or waterway, it would need to meet NYSDEC SPDES standards for such discharges. In addition, any previously dumped materials would need to be handled and disposed of in accordance with all applicable regulations. With these measures in place, the proposed project would not result in potential significant adverse impacts due to hazardous materials during construction.

TRANSPORTATION

Worker and Truck Trips

Worker Trips

Construction activities would generate minimal traffic during the traditional peak traffic hours. Construction workers typically travel to and from a construction site before the peak morning commuter peak traffic period (typically arriving between 6:00 and 7:00 AM) and depart before the peak afternoon commuter peak traffic period (departing between 3:00 and 4:00 PM), with limited weekend work. This typical construction travel pattern would minimize peak period traffic, since construction vehicle trips generally do not affect the local traffic network during the standard peak transportation hours (8:00 to 10:00 AM and 5:00 to 7:00 PM). Based on the typical sewer and BMP capital projects the following number of construction workers are expected:

- Sewer installation, BMP, and outfall work would require approximately 20 to 25 individuals on the average workday;

- Street reconstruction work (i.e., final paving) would require an average of approximately 15 to 20 individuals; and
- For less intensive work periods (i.e., landscaping), average workers at the site would total between 5 to 10 individuals.

Thus, during the more intensive work periods there would be approximately 20 to 25 vehicle trips arriving at the project site, very few of which would arrive during the typical AM peak hours. Most construction would be completed prior to the start of the PM peak hour.

Truck Trips

In addition to the workers, there would also be trucking activity associated with the delivery and removal of soils and the delivery and removal of materials (e.g., pipes and concrete) during the sewer and BMP construction. All truck trips would be required to use designated truck routes through each of the watersheds as their primary means of ingress and egress within each watershed, and therefore would avoid local neighborhoods. Truck deliveries are expected to typically include:

- Asphalt and soil removed from sewer trenches;
- Delivery of piping and other materials (such as concrete) for sewer installation;
- Soils imported for sewer trench backfill and BMP construction:
- Engineered fill and asphalt for road repaving; and
- Landscape materials for BMPs.

These truck trips would be dispersed throughout the day and the number of trips would vary depending upon the phase of construction, but the majority of trips would occur between the hours of 7:30 AM and 3:30 PM and only a limited number would occur during the AM peak hour, since most construction work is completed prior to the start of the PM peak hour. The rate of truck trips is expected to be as follows:

- Sewer installation, BMP grading, and outfall work: 15 to 20 trucks per day (including dump trucks, concrete trucks, flatbed trailers, etc.,);
- Street construction work: 10 to 15 trucks per day; and
- Other site work (e.g., staging): 5 to 10 trucks per day.

Parking

The three watersheds contain primarily low-density residential uses, with off-street driveway parking and ample on-street parking. It is therefore expected that construction workers would park on the local streets in the vicinity of the proposed construction site. This would generate an on-street parking demand of about 15 to 25 vehicles per day depending on the phase of construction.

Maintenance and Protection of Traffic

BMP construction would be performed outside of the local streets. Therefore, in-street sewer construction would require more detailed and comprehensive maintenance and protection of traffic management plans, which would be subject to review and approval by DOT. In-street sewer construction would require temporary lane or street closings, in addition to on-street parking restrictions. During some phases of construction, certain local streets may be closed to all but local traffic. However, it is expected that larger arterials, such as Hylan Boulevard and

Richmond Avenue, would maintain at least one travel lane in each direction during all work and thus would not be completely closed to traffic. To maintain traffic flow and for safety reasons, access to neighborhoods would be provided from at least two directions. In addition, the contractor would be required to restore the full width of the street at the end of each daily construction period such that the free flow of traffic could resume. All construction activities and closures would be subject to DOT approval under a street and sidewalk construction permit and a plan for the maintenance and protection of traffic would be submitted to DOT for review and approval for each capital project.

D. TYPICAL CONSTRUCTION ACTIVITIES

STAGING AREAS

All construction requires a staging area separate from the work zone for the purposes of storing vehicles, to park construction equipment and materials. The selection of a construction staging site would be at the discretion of the contractor. Any use of private lands for staging would be contingent upon landowner approval, and the need for any fencing or erosion control measures would be the responsibility of the contractor. If other City lands are used, staging areas on City-owned property require restoration to at least pre-construction conditions after construction is completed. Construction-limiting fencing would delineate the limits of staging areas at BMP sites and would help protect wetland and natural resources habitats. In all cases, BMP sites used for staging would be restored as part of the proposed BMP final landscaping.

BMP CONSTRUCTION METHODS

Construction techniques and duration would vary for each BMP, depending on design. In general, backhoes, dump trucks, and grading equipment, along with hand-held power equipment, are necessary for most BMP construction. As discussed above under "Erosion and Sediment Control," the BMP sites would also be used for sediment capture during the sewer construction phase of the capital projects. These soil erosion and sediment control practices would be implemented at all proposed BMP sites before any storm sewer construction would proceed. As sewer construction moves forward, the captured sediments would be regularly removed. Once construction is complete, the site would be planted with wetland emergent plants, or graded for permanent pools and open water in accordance with the BMP design. **Tables 6.1-1** through **6.1-3** present a summary of the construction activities at each of the proposed BMPs.

Many BMPs in the Mid-Island program involve the construction of larger extended BMPs, some up to 29 acres in size. The first step in constructing a typical extended detention basin or wetland restoration project would be to rough mark the project site and identify the clearing limits as per the final BMP designs; this marking may be modified in the field based on observed conditions and decisions that may avoid the removal of important trees or stands of vegetation, where feasible. In the early phase of construction, construction-limiting fencing would be installed for the purposes of implementing soil erosion and sediment control techniques, as well as to install the tree and wetland barrier protections. Once these measures are in place, construction access would be established.

As the first step in project clearing, small caliper trees (less than six inches) would be cut to the ground. The larger trees would then be cut and removed as necessary, and the site would be rough graded, which includes the removal of all tree stumps. Heavy equipment, such as

backhoes and front end loaders, is then brought in to excavate and construct the forebay which would be used as a temporary sediment basin during construction.

Once the forebay is installed, the proposed new storm sewer outlet would be installed, but not put into service until the BMP installation is completed. If necessary and where a BMP site includes a flowing stream, a temporary diversion system would be installed to divert the flow away from about half of the BMP, so that work could continue. Excavation grading and contouring then begins to create the proposed BMP design grades. Once excavation is complete, an impervious geosynthetic liner would be installed at the base of the BMP (if called for in the design specifications). Final grading and finishing would then be completed and the soil stabilized with temporary plantings. If a stream diversion is necessary, the diversion would be shifted to the other half of the BMP and a similar construction sequence would then performed on the other half of the BMP. As part of this phase, any structural elements such as a weir or riser box would be installed. In addition, grading for the proposed berms would occur this phase.

With the major grading, shaping and installation of structures at the BMP now complete, any temporary stream diversion measures would be removed and the new stream channel opened. Then the final planting would be completed over the entire BMP site. This would include any downstream bank stabilization. Once the planting program is completed, all construction limiting fencing is then removed. As the final phase of construction, final storm sewer connections are completed and the sewer is placed into service. Lastly, any remaining disturbed areas are restored in accordance with a planting plan and specifications.

During the above construction phases, sediments are regularly removed from the forebay, as needed, with a final cleaning as construction is completed and before the BMP is placed into service.

These phases of construction would be similar for most of the larger BMPs. The smaller BMPs, such as the outlet stilling basins, would have a more simple construction phasing, due to their smaller size and less clearing, grading, and structural installation, compared to larger BMPs. BMP construction would be about 9 to 18 months (a longer duration for the larger BMPs). Smaller BMPs would have a much shorter construction period of about 3 to 4 months. If there is bank stabilization downstream of the outlet stilling basin, an additional 1-2 months of construction would be necessary.

TYPICAL OUTFALL CONSTRUCTION

As described above, each of the proposed watersheds would have an outfall and the outfalls would extend out into the Lower Bay. Overall, the areas affected by construction of each outfall include:

- About 2.0 acres in the Oakwood Beach watershed, which would include upland, sand beach, and benthic (littoral zone) wetlands in the bay;
- About 1.7 acres in the New Creek watershed, which would include upland, a segment of Father Capodanno Boulevard, boardwalk, sand beach, and benthic (littoral zone) wetlands in the bay; and
- About 2.0 acres in the South Beach watershed, which would include upland, a segment of Father Capodanno Boulevard, boardwalk, sand beach, and benthic (littoral zone) wetlands in the bay.

As the first step in the outfall construction, the upland route is rough marked and construction access and staging areas identified. For the upland segments of the outfall, heavy equipment is used for excavation, installation of the pipe, backfilling and final cover including final plantings and replacement of vegetative cover or recreational facilities, where appropriate, (the upland segments would be constructed using the cut-and-cover technique). In-water work would be performed from barges. During the construction of the in-water segments, turbidity controls would be installed to help protect local water quality. Construction would continue from the shoreline and containment structures may also be used to manage suspended sediments at the shoreline edge.

Construction of the proposed New Creek and South Beach outfalls would also involve crossing Father Capodanno Boulevard. Therefore, coordination with NYCDOT, including creating a Traffic Management Plan for the phases of construction, would be necessary. Outfall construction would also require coordination with DPR, since the outfalls would cross City parkland associated with Great Kills Park and the Franklin Delano Roosevelt Boardwalk and Beach Park. Construction of each of the proposed outfalls is expected to take about 12-15 months.

SEWER CONSTRUCTION METHODS

Sewer construction primarily uses the "cut and cover" technique: excavate a trench in the street, lay the pipe, backfill and repave the street. This phase of construction typically involves the use of jackhammers, pavement cutters, backhoes, cranes, flatbed delivery trucks, pumps (when dewatering is necessary), and equipment for resurfacing roadways, such as asphalt trucks, dump trucks, and rollers. On average, sewer construction progresses at a rate of approximately 80 feet per day and generally involves three jackhammers, one pavement breaker, or one diamond saw used on any block at a given time. Pavement breaking operations on any given block may last for half of a day.

With the proposed sewer construction, it is possible that some overhead or subsurface utility lines would need to be temporarily relocated outside the existing roadway, by the utility company, at the request of the City. Requests for such work would be made when the utility lines are an obstruction to sewer installation. In these cases, soil erosion control measures would be implemented depending on the extent of disturbance, slopes involved, and proximity to wetlands. If wetland permits or authorizations are necessary, they would be the responsibility of the utility company. Any potential disturbances are expected to be limited to the area affected by installation of the utility line. Where this does occur, the utilities would relocate to the road shoulder once construction is complete. Potential relocation of utility lines is not expected to significantly affect natural resources or wetlands, since the activity would be limited to driving utility poles and trimming branches of certain trees to accommodate the passage of utility lines. The utility contractor would be responsible for the final grading and restoration of these areas.

E. PROBABLE IMPACTS DURING CONSTRUCTION

LAND USE, ZONING, AND PUBLIC POLICY

Although the proposed project is extensive at the drainage plan level, construction of each capital project would be phased and require approximately one to two years of construction. Sewer installation progresses along City streets at a pace of about 80 feet per day. Typical BMP construction would require about 9 to 18 months. Construction of the proposed outfalls would

average about 12 to 15 months. All sewer work would be performed within mapped City streets, or DEP sewer easements. BMP construction would take place on Bluebelt lands, or City or state parklands. Outfall work would be performed on City streets and parkland. Any potential disruptions around BMPs (within 400 feet) and along sewer corridors due to construction would be temporary and short in duration and would not result in any short-term or long-term land use changes. Construction would also not conflict with local zoning or public policies and would not displace any existing uses. Therefore, the proposed project would not result in potential significant adverse impacts to land use, zoning or public policy during construction.

OPEN SPACE

During the construction period, it is expected that there would be disruptions to park uses and access resulting from construction-related clearing and grading, and the associated vehicular traffic and noise from both vehicles and the operation of equipment and the dust and emissions from construction activity. These disruptions would be temporary and short in duration (9 to 18 months) and would be similar to park reconstruction projects that involve construction in natural areas and any areas affected by construction would be restored as part of the proposed project. Reeds Basket Willow Swamp Park, Richmond County Country Club, Great Kills Park, Franklin Delano Roosevelt Boardwalk and Beach, Willowbrook Parkway and Last Chance Pond are the parklands that would be affected. The proposed project would have a noise control plan and implement air quality control measures (see the discussion below under "Transportation," "Air Quality" and "Noise") so that parkland and park users would not be adversely affected. In addition, the permits from DPR for construction activities in parks would be obtained. These permits would require the implementation of the measures necessary to minimize park disruptions (such as maintenance of park access where appropriate, measures to minimize noise and air impacts, access and transportation routes for construction vehicles and deliveries, tree protections, coordination with any DPR construction activities, etc.). In areas with recreational facilities (such as in Franklin Delano Roosevelt Boardwalk and Beach Park), the proposed project would restore any park facilities affected by construction to pre-construction conditions. Therefore, with these measures in place, the proposed project would not result in potential significant adverse impacts to open space during construction.

HISTORIC AND CULTURAL RESOURCES

ARCHAEOLOGICAL RESOURCES

Construction excavation may potentially disturb subsurface archaeological resources at certain BMP locations. These locations are identified in **Chapters 3.7, 4.7, and 5.7**. In order to avoid disturbances to identified archaeological resources during construction, a Phase 1B testing plan would be implemented as part of the proposed project. Therefore, the proposed project would not result in potential significant adverse impacts to archaeological resources during construction.

ARCHITECTURAL RESOURCES

There are no historic architectural resources that would be impacted during construction of the proposed project. DEP would also coordinate with DPR in the design of the proposed outfalls across the Cedar Grove Beach Club to avoid any impacts on any potential historic structures. Therefore, the proposed project would not result in potential significant adverse impacts to architectural resources during construction.

NATURAL RESOURCES

HYDROLOGY

Some BMPs would require temporary stream diversions during the stream realignment process. To minimize potential effects on surface flows and hydrology, sequencing of channel diversions would be implemented to maintain the necessary base stream flows during construction so that work could be performed without significant alternation to the channel flows. These measures would be implemented as part of the proposed project. In all cases, stream flow capacity would be maintained and no flooding would be expected as a result of the proposed in-water work. Diversions would be designed for heavier storms that may result in a washout and require repair or replacement of diversion measures. However, the probability of this occurrence would be low, given the short term duration of any stream diversion construction activities. Therefore, the proposed project would not result in potential significant adverse impacts on hydrology during construction.

GROUNDWATER

Storm sewer construction may also require dewatering in areas of shallow groundwater. The areas of the watershed with the greatest potential for dewatering would be in the lower watersheds, where the groundwater table is closer to the surface. If dewatering is necessary, pumped groundwater would be returned to either the surface water system or discharged to a City sewer, only after collection and treatment in sediment traps, filters, or portable sediment tanks. The volume of groundwater pumped during construction would vary depending upon the location. However, in all cases, areas of the proposed pumping would be physically contained within barriers provided by cofferdams or steel sheeting which limits the volume of pumped groundwater and such pumping would also be temporary and of short duration. Therefore, the proposed project would not result in potential significant adverse impacts to groundwater during construction.

WATER QUALITY

Measures to protect water quality in surface waters during construction would include those described above under “Erosion and Sediment Control” and “Wetland Protections.” These measures would be employed as part of the proposed project to avoid water quality impacts. Other water quality protection measures and requirements may result from SPDES permits and related SWPPP required for construction activities. Therefore, the proposed project would not result in potential significant adverse impacts to water quality during construction.

WETLANDS

Construction at many BMP sites would involve activities within or adjacent to wetlands and other sensitive habitats such as woodland stands. Construction activities would therefore be required to meet protective control program requirements per NYSDEC and USACE, including special wetlands protections and the protection of protected plants, trees and woodlands that are within or adjacent to a construction site and would remain after construction. As describe above under ‘Wetlands Protections,” construction activities would be limited to a proposed delineated area of disturbance at each BMP (i.e., the BMP footprint). As the final stage of construction, all temporarily disturbed wetlands and adjacent areas would receive final landscaping in accordance

with the proposed BMP designs. Therefore, the proposed project would not result in potential significant adverse impacts to wetlands and related habitats during construction.

VEGETATION AND TREES

Most proposed BMP sites, with the exception of NC-6 and NC-11, would require only minor tree clearing and site grading either within Bluebelt property or City parkland. To avoid indirect and unintended injury or damage to trees that are proposed to remain after BMP construction, the following protection measures would be applied during staging and construction (see **Table 6.1-4**):

- Pre-construction surveys for any protected plant species and the identification of species for plant rescue and relocation.
- Clearing and grading limits would be clearly marked prior to construction.
- Trees to remain after construction would be protected by barricades consisting of sturdy wood posts and rails at a distance of at least 10 feet from the trunk of each tree. This would prevent vehicles and equipment from damaging the tree trunks or compacting the soil over the root system.
- To protect against root damage, pests and diseases, roots would be cleanly cut during excavation near trees. Exposed roots would also be kept moist. When feasible, there would be a compensatory trimming of the tree canopy to balance the root loss.
- As the final stage in construction each BMP site would be restored in accordance with the proposed BMP design and diverse planting program including the planting of native herbaceous, shrub and tree species.

In addition, the proposed project would follow all DPR tree protection measures, as required for work in City parkland. With these measures in place, the proposed project would not result in potential significant adverse impacts to trees or vegetation during construction.

WILDLIFE

Overview

Most wildlife in all three watersheds is accustomed to human presence and activity, due to the dense urban nature of Staten Island. However, it is expected that there would be temporary construction-period disruptions because of habitat disturbance and the avoidance of construction areas by birds and other wildlife. Because the proposed BMPs would be implemented over many years under individual capital projects, disruptions to wildlife would be temporary and short in duration, as each BMP site is constructed. This temporary displacement of wildlife would not be simultaneous across each watershed as project phasing would allow for new BMPs to become established as other BMPs enter into design and construction and provide restored and diversified habitats. The proposed project would also implement any of the necessary pre-construction mitigation measures to avoid impacts to wildlife (see Chapter 8.1 “Mitigation Measures”). Therefore, the proposed project would not result in potential significant adverse impacts to wildlife during construction.

Fish and Other Aquatic Resources

As discussed above, the proposed project would involve in-water activities for work at the proposed BMP and outfall sites. This would result in temporary construction-related disturbances to aquatic biota where the proposed project would require construction in actively

flowing streams, such as the Main Channel of New Creek, or in lakes or ponds, such as the proposed riser box in Cameron's Lake, or in Raritan Bay with the proposed outfalls. These temporary construction-period disturbances may result in fish avoidance of construction areas for outfalls coupled with disturbance to benthic communities. In all cases, disturbance to fisheries and aquatic habitats would be short term and temporary, contained within the immediate area of the proposed construction activity, and protection measures would be implemented as part of the proposed project any protection (e.g., silt curtains, coffer dams, and erosion and sediment control). The proposed project would also implement additional measures, identified during the permitting process. The Staten Island Bluebelt Project also has specifications in-place (based on prior South Richmond watershed projects) for the rescue of wildlife, including fish, as may be necessary to avoid impacts or as may be required during the project permitting process. Therefore, the proposed project would not result in potential significant adverse impacts to aquatic biota during construction.

Table 6.1-4
Tree Protection Measures

Concern	Construction Activity	Protection Measures
Root loss	Stripping of surface soil during grading	Woody vegetation to be removed adjacent to trees should be cut at ground level and not pulled out by equipment, or root injury to remaining trees may result.
	Lowering grade, scarifying, preparing subgrade for fills, structures	Use retaining walls to maintain natural grade as far as possible from trees. Excavate to finish grade by hand and cut exposed roots cleanly to avoid root wrenching and shattering by equipment.
	Trenching for utilities	Coordinate utility trench locations with installation contractors. Excavate trenches by hand in areas with roots larger than 25 mm (1 inch) in diameter. If necessary, equipment should operate on double, overlapping, thick plywood sheets within the dripline.
Wounding tree canopy	Heavy equipment operation	Fence trees to enclose low branches and protect trunk. All damage should be treated promptly.
	Pruning for vertical clearance for building, traffic, and construction equipment	Prune to height requirements prior to construction. Consider maximum height requirements of construction equipment and emergency vehicles over roads. All pruning should be performed by experienced personnel.
Root stress	Heavy equipment traffic	Fence trees to keep traffic and storage outside the dripline of trees. Provide a storage yard and traffic areas for construction activity well away from trees. Protect soil surface from traffic compaction with thick mulch or double, overlapping, thick plywood sheets. Following construction, vertically mulch compacted areas or install an aeration system. Auger or water-jet holes.
	Accidental spills, waste disposal (e.g., paint, oil, fuel)	Construction specifications clearly state disposal procedures in accordance with all environmental laws. Post notices on fences prohibiting dumping and disposal of waste around trees. Require immediate cleanup of accidental spills.
	Grade changes	Where surface grades are to be modified, make sure that runoff will flow away from the trunk and not pool at the trunk.

Source: Matheny, N.P., 1989, *Preserving Trees Affected by Development.*

HAZARDOUS MATERIALS

The proposed project includes a program to address any potential construction-period effects due to the presence of hazardous materials in soil or groundwater (see Chapters 3.10. 4.10 and 5.10). Therefore, the proposed project would not result in potential significant adverse impacts with respect to hazardous materials during construction.

SOLID WASTE AND SANITATION SERVICES

Construction activities under the proposed project would generate minimal solid waste. For example, sewers are not packaged or wrapped and arrive at the construction site ready to be installed. Often, the tie-downs used during transportation are reusable and are not thrown away. Asphalt from the streets would be removed and disposed of or reused. Cut trees and vegetation would be mulched and may be reused on Bluebelt properties. The contractor would be responsible for transporting and disposing of construction period solid waste according to all federal, state and City regulations and would also be required to keep the work area free of debris. Boulders unearthed during excavation would be used by DEP for perimeter security at Bluebelt sites. Vegetative waste, including logs and shrubs, would be recycled or disposed of in accordance with federal, state and City regulations. Therefore, the proposed project would not result in potential significant adverse impacts to solid waste and sanitation services during construction.

TRANSPORTATION

TRAFFIC

Worker Traffic

The proposed project would generate trips from workers traveling to and from the site and from the movement of goods and equipment. As described above, the estimated average number of construction workers on site at any one time would vary, depending on the stage of construction. The more intensive periods would average 20 to 25 individuals. Given this limited number of trips and that typical construction hours often commence and end during the standard off-peak travel times, no substantial increases in local traffic volumes are expected with the proposed project. Temporary increases in vehicular traffic during construction would not be expected to exceed the 50-peak hour trip threshold established by the 2010 *CEQR Technical Manual*. Therefore, the proposed project would not result in potential significant adverse traffic impacts from worker vehicles during construction.

Truck Traffic

Truck traffic, including removal and delivery of soil, asphalt, piping, and materials, would be dispersed throughout the weekday, and would generally occur between the hours of 7:30 AM and 3:30 PM with only a limited number of trips during standard peak traffic hours. As stated above, sewer installation, BMP, and outfall work would be the more truck intensive phases of construction and would generate 15-25 truck trips per day. Any potential truck traffic increases associated with construction would be temporary and short in duration. Therefore, the proposed project would not result in potential significant adverse impacts from truck traffic generated during construction.

Diverted Traffic

The proposed project would require work in local streets for storm sewer installation. Traffic flows would be temporarily and partially affected by the proposed project. If full street closures

are necessary for limited street segments, these, too, would be temporary and of short duration. Overall, work in local streets would proceed along various street segments throughout the project area and would be of short duration. In addition, the contractor would be required to restore the full use of the street at the end of each daily construction period to allow for free flow of traffic. All construction activities and closures would be subject to DOT approval under a street and sidewalk construction permit. A traffic management plan would also be submitted to DOT for review and approval. Therefore, the proposed project would not result in potential significant adverse impacts to traffic during construction.

PARKING

Any affected on-street parking would be temporary and would not result in the temporary displacement of large numbers of on-street parking spaces. Street construction for the proposed storm sewer segments would not affect more than 20 to 30 on-street parking spaces during the periods of intensive sewer construction activities. All construction activities and temporary removal of street parking would be subject to DOT approval under a street and sidewalk construction permit. Construction workers may park on the local streets, but it is not expected that the limited number of workers would result in a shortfall of on-street parking. Therefore, the proposed project would not result in potential significant adverse impacts to parking during construction.

TRANSIT

Certain phases of construction may temporarily affect local bus service due to in-street work. Any disruption, however, would be at limited locations and for short periods. To the extent any bus stops would need to be temporarily relocated, this would be coordinated with DOT and the New York City Metropolitan Transportation Authority (MTA) prior to construction, and would be implemented during construction by the contractor. Proposed BMPs would involve construction beneath the Staten Island Railway overpass and would not result in any disruptions to rail service. The proposed project would not disrupt transit rail service. Bus services would only experience limited disruptions during the period of construction along Richmond Avenue or Hylan Boulevard. Therefore, the proposed project would not result in potential significant adverse impacts to transit during construction.

PEDESTRIANS

The proposed project would require temporary sidewalk closures for some project phases. These closures would be temporary and the necessary diversions would be provided for at each phase of street construction. Any sidewalk closures would provide the appropriate protection measures, including signage, and all sidewalks and pedestrian paths would be restored as part of the street reconstruction. All construction activities and sidewalk closures would be subject to DOT approval under a street and sidewalk construction permit. Therefore, the proposed project would not result in potential significant adverse impacts to pedestrian traffic during construction.

AIR QUALITY

MOBILE SOURCE EMISSIONS

Potential construction-period mobile source emissions originate from three sources: additional construction vehicles, local traffic diversions near construction sites, and heavy equipment

operations. Carbon monoxide emissions tend to be localized and due to the limited number of additional construction-associated vehicles, emissions from these sources would not affect local air quality. Likewise, any local increases in hydrocarbons and nitrogen oxide due to construction equipment would not be significant. City regulations require all project contractors to reduce particulate matter emissions to the extent practicable by employing relatively new equipment including diesel oxidation catalysts (DOCs). Construction activities would also be subject to New York City Local Law 77, which requires the use of Best Available Technology (BAT) for equipment at the time of construction.[1]

FUGITIVE DUST

Fugitive dust emissions can result from excavation, hauling, dumping, spreading, grading, compaction, wind erosion, and traffic over unpaved areas. The intensity of fugitive dust emissions is dependent on the extent and nature of the clearing operations, the kind of equipment employed, the physical characteristics of the underlying soil, the speed at which construction vehicles are operated, and the type of fugitive dust-control methods employed. The proposed project would require excavation, site grading, and repaving. Most of this activity would take place in or adjacent to residential areas. However, most of the fugitive dust generated by construction activities is large-sized particles that settle to the ground a short distance from the construction activity.

Because fugitive dust is a common occurrence during construction, it is regulated under the City code. In accordance with the code all appropriate fugitive dust control measures would be used to satisfy Section 1402.2-9.11 of the New York City Air Pollution Code during construction. These measures include, but are not limited to:

- Use of water to suppress dust in the construction operations and during the clearing and grading of land;
- Application of water to dirt paths, materials, stockpiles, and other surfaces that can generate airborne dust over extended periods. Temporary roads would be built with properly sized stone or concrete equivalent over filtering material;
- Covering of open-body trucks transporting materials likely to generate airborne dust at all times when in motion; and
- Prompt removal of earth or other material from paved streets where earth or other material has been deposited by trucking or earth-moving equipment, erosion by water, or other means.

The contractor would be required to implement a dust control plan with fugitive dust control measures and specifications. In addition, the soil erosion and sediment control practices presented above would have the dual benefit of providing dust suppression. Any effects on local air quality associated with construction, including air quality, would also be temporary and of short duration with each capital project. Therefore, the proposed project would not result in potential significant adverse impacts to air quality during construction.

[1] New York City Administrative Code § 24-163.3, adopted December 22, 2003, also known as Local Law 77, requires that any diesel-powered non-road engine with a power output of 50 hp or greater that is owned by, operated by or on behalf of, or leased by a City agency shall be powered by ultra low sulfur diesel fuel (ULSD), and utilize the best available technology (BAT) for reducing the emission of pollutants, primarily particulate matter and secondarily nitrogen oxides. DEP is charged with defining and periodically updating the definition of BAT.

NOISE

Construction activities associated with the proposed project would result in localized temporary noise increases. Disturbances to community noise levels during construction typically result from two sources: (1) construction equipment operation; and (2) construction vehicles and delivery vehicles traveling to and from the site. Noise levels at a given receptor location depend on the number and types of construction equipment being operated, distance of the receptor from the construction site, and any shielding effects (attenuation due to structures or natural barriers). Noise levels caused by construction activities also vary widely and depend on the construction phase. Typically, the loudest noises associated with construction are jackhammers and pile driving. Noise levels for various types of construction vehicles, apparatus, and equipment are provided in **Table 6.1-5**.

Table 6.1-5
Noise Levels for Typical Construction Equipment

Equipment	FTA (or FHWA) Typical Noise Level (dBA) at 50 feet
Arc Welder	73
Asphalt Pavers	85
Asphalt laying equipment	85
Backhoe	80
Bulldozer	85
Compactor	80
Compressors	80
Cement Mixer	85
Concrete Pumps	82
Concrete Trucks	85
Delivery Trucks	84
Dual Hoist	85
Crane (Crawler Crane)	85
Crane (Hydraulic Crane)	85
Crane (Tower Crane)	85
Crane (Rubber Tire Crane)	83
Drill Rigs	85
Dump Trucks	84
Excavators	85
Forklift	85
Generators	82
Impact Wrenches	85
Jackhammers	85
Pavers Cutter	85
Pile driving rig	95
Rebar Bender	80
Roller	85
Saw (Chain Saw)	85
Saw (Circular Saw)	76
Saw (Table Saw)	76
Scissor Lift	85
Slurry supply system	85
Tamper	85
Trailers	85
Toweling Machine	85
Water Pumps	77

Sources: Transit Noise and Vibration Impacts Assessment, Federal Transit Administration, May 2006; and Federal Highway Administration Roadway Construction Noise Model (FHWA RCNM), 2006.

Construction noise is regulated by the New York City Noise Control Code (Local Law 113) and the United States Environmental Protection Agency (EPA) noise emission standards for construction equipment. These federal and local requirements mandate that certain classifications of construction equipment and motor vehicles meet specified noise emissions standards. Except under exceptional circumstances, construction activities must be limited to weekdays between the hours of 7:00 AM and 6:00 PM. Construction materials would also be handled and transported in such a manner as to not create any unnecessary noise. These noise control measures would be included in the contract documents as specifications and directives to the contractor.

In addition, in accordance with City regulations, a noise control plan would be developed and implemented to minimize intrusive noise into nearby areas and effects on sensitive receptors. The noise control would plan may include such restrictions as specifying locations for noise generating equipment and avoiding unnecessary late night and weekend construction activities. A copy of the noise mitigation plan would be kept at the project site for compliance review by DEP and the New York City Department of Buildings (DOB). Significant noise levels to sensitive receptors would not result from the proposed project due to the temporary nature and short duration of construction.

Pursuant to section 24-222 of the City code, there are a number of circumstances under which after hours work (i.e., outside of the 7 AM to 6 PM weekdays limit) can be authorized. If after hours work is scheduled, DEP would be notified to ensure all other analyses and findings completed for the environmental review remain applicable. DEP may authorize such work provided that the noise control plan is updated by the contractor and submitted to DEP for review and approval. Therefore, the proposed project would not result in potential significant adverse noise impacts during construction.

VIBRATIONS

Vibrations generated by construction activities can be perceptible and in some cases potentially damaging to structures. No blasting is proposed; however, pile driving may be necessary for the proposed outfalls. Vibratory levels at a given receptor are a function of the source strength, the distance between the equipment and the structural receptor, characteristics of the transmitting medium, and the receiver building construction. Construction equipment operation can cause ground vibrations that travel through the ground, but decrease in strength with distance. During the pile driving phase of construction, monitoring may be used to determine if vibration levels are potentially damaging to nearby structures. Construction traffic does not typically result in perceptible vibration levels and would be temporary and short in duration. Therefore, the proposed project would not result in potential significant adverse impacts from vibration during construction.

F. CONCLUSIONS

Implementation of the proposed project would require multiple capital projects that are expected to continue through 2043 at which time full build out of the proposed project would be complete. Each individual capital project is expected to include a BMP, associated in-street sewer construction, and a construction period of 1 to 2 years. Capital project construction would also move among various geographic areas in each of the watersheds during this 30-year build out. Construction of each capital project would be temporary and short in duration in each project area.

There would be a number of environmental protection measures that would be implemented with each capital project. These include soil erosion and sediment control practices, wetlands and tree protections, a noise control plan, a traffic management plan, a CHASP for hazardous materials, and air pollution control practices in accordance with local laws. For activities within City or state parklands, pre-construction agreements for work in open spaces or natural areas affected by the proposed project would be restored and enhanced as part of the proposed BMP design which would be coordinated with DPR for those portions of the site that are within DPR lands. The proposed project would include a landscape and tree replacement plan for trees that would need to be cleared in constructing the proposed BMP. Protection measures would also be implemented to protect natural features, with post-construction restoration of areas affected by construction. With all of the above measures in place and given that the construction of individual capital projects would be temporary and of short duration, the proposed project would not result in potential significant adverse impacts due to construction. ✷