

### A. PROJECT DESCRIPTION

#### PROJECT BACKGROUND

The City of New York, with the New York City Department of Parks & Recreation (DPR) as lead agency, is proposing the East Park road system within the East Park area of Fresh Kills Park. The proposed East Park is approximately 482 acres in size and is City-owned property under the jurisdiction of the New York City Department of Sanitation (DSNY). Its boundaries to the east are Richmond Avenue (to the east across Richmond Avenue is LaTourette Park and commercial uses, the Staten Island Mall). Main and Richmond Creeks border the property to the northwest and southwest, respectively.

The proposed East Park Roads system would include connections to Richmond Avenue with potentially up to approximately two miles of public roads that would connect Richmond Avenue on the east with the West Shore Expressway on the west. The proposed public roads would improve local vehicular circulation and divert traffic from congested local roads while also providing access to the proposed park. This SEIS has been prepared to analyze the three phases of the park roads construction which include: 1) proposed road embankments across Fresh Kills Landfill that would be implemented as part of the final cover construction at Landfill Section 6/7; 2) completion of the Yukon Avenue Connection; 3) completion of the East Park Road system in its entirety under one of four road options. In addition to analyzing the potential impact of the proposed roads, the SEIS identifies the potential significant adverse impacts, impact avoidance and mitigation techniques, and evaluates alternatives to the proposed project.

The Fresh Kills Park project was the subject of a comprehensive environmental review that was completed with the issuance of a Final Generic Environmental Impact Statement (FGEIS) released on March 13, 2009. This Supplemental Environmental Impact Statement (SEIS) has been prepared to analyze in greater detail the potential impacts of the proposed East Park road system, which at completion would provide approximately two miles of public roads across East Park. The project site is located in the southwest portion of Staten Island, within Staten Island Community Board 2.

For many decades over the latter half of the 20th Century, Fresh Kills Landfill operated as the City's principal municipal solid waste landfill, receiving household and municipal solid waste between 1948 and 2001. A state law enacted in 1996 mandated that solid waste landfill operations cease at Fresh Kills Landfill by December 31, 2001; landfilling subsequently ended on March 22, 2001. After that date, Fresh Kills Landfill was only temporarily used for the disposal of materials from the attacks of September 11, 2001. During this time, no other materials were brought to the landfill.

Large portions of the Fresh Kills property are occupied by four solid waste landfill areas—Landfill Sections 3/4, 2/8, 6/7, and 1/9. These four landfill sections are regulated as Solid Waste

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Management Units (SWMUs) by the New York State Department of Environmental Conservation (DEC). With the cessation of solid waste disposal operations at Fresh Kills Landfill, final closure and post-closure activities are underway. Landfill Sections 3/4 and 2/8 are closed. Final closure design has been approved by DEC and closure construction is underway at Landfill Section 6/7. East Park and the East Park roads are proposed to be built over Landfill Section 6/7.

The Fresh Kills property includes not only the landfill sections, but also the land around the landfill sections. These areas have facilities once used by DSNY when the site was still receiving solid waste and include buffer areas separating the landfill from the local community. This land also includes DSNY stormwater management, environmental control, and maintenance and monitoring infrastructure systems that will remain in place for at least 30 years after closure construction is complete. This infrastructure was installed by DSNY in accordance with a design approved by DEC. DEC also regulates activities in these environmental compliance buffer areas around the SWMUs. The portions of East Park that are outside the delineated landfill section include lands to the west between the base of the landfill and the shorelines of Main and Richmond Creeks. These areas are occupied by DSNY haul (service) roads and tidal wetlands along the creeks. To the east, this includes lands between the base of the landfill and Richmond Avenue, and DSNY landfill drainage basins and wetlands, as well as a berm and buffer fronting Richmond Avenue.

The proposed Fresh Kills Park is an extensive park development project, one of the largest in the history of the City of New York. The park is comprised of five key planning areas: North Park, South Park, West Park, the Confluence, and East Park. Upon completion, Fresh Kills Park (at 2,163 acres) will be the City's second-largest park (after Pelham Bay Park in the Bronx, which is 2,765 acres in size). It will be approximately three times the size of Central Park, will more than double the acreage of the Staten Island Greenbelt, and will provide a total of seven miles of roads with park access and connections between the West Shore Expressway and Richmond Avenue. Given the size of the project and its complexity, park and road development would be implemented in multiple phases through 2036.

This SEIS has been prepared specifically to describe and analyze the proposed East Park roads component of the Fresh Kills Park project, which is described in greater detail below.

### **DESCRIPTION OF THE PROPOSED PROJECT**

#### *PROJECT SUMMARY*

The proposed East Park roads that are the subject of this SEIS are all located within the East Park planning area of Fresh Kills Park. The proposed East Park roads project is comprised of three components:

- By 2011, completion of a grading plan with a road embankment to accommodate potential future public roads as part of the final landfill cover at Landfill Section 6/7, in accordance with the "Fresh Kills Park Landfill Section 6/7 Final Cover Design Report, Addendum 1" (Geosyntec, September 2009)—this phase is assumed to be completed as part of the final closure construction at Landfill Section 6/7;
- By 2016, completion and operation of the Yukon Avenue Connection as a two-lane public road, crossing Landfill Section 6/7 and connecting on the east with a new intersection at Richmond Avenue and on the west with the Confluence Loop Park Road, which in turn would provide access to the West Shore Expressway; and

- After 2016, completion of the East Park road system with the implementation of one of the options presented in this SEIS: four- or two-lane roads across East Park with new connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road; widening the Yukon Avenue Connection from two lanes to four lanes; and/or a two-lane loop road around the base of Landfill Section 6/7 (reusing the alignment of the existing service haul roads), which is referred to in this SEIS as the East Park Loop Road, with connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road. Operation of the completed East Park road network has been analyzed in this SEIS as a 2036 analysis year.

The 2016 and 2036 analysis years presented in this SEIS correspond to the analysis years presented in the Fresh Kills Park FGEIS (March 2009). These years are not the completion years for road construction (i.e., road construction could be completed earlier), rather they are analysis years by which the phases of the East Park roads and overall Fresh Kills Park would be completed and operational and are therefore appropriate analysis years for providing a comprehensive impact analysis of natural resources, traffic, air quality, and noise conditions (for example).

#### *PROJECT CONSTRUCTION PHASING*

Within the context of the larger Fresh Kills Park project, development of the East Park road system is proposed to proceed in three phases: 1) completion of closure construction at Landfill Section 6/7, thereby meeting DSNY and the City's obligations for closing that landfill section, while also integrating a 60-foot-wide road embankment along the proposed Yukon Avenue and Forest Hill Road Connection alignments (these are two of the road options under consideration)—this phase is assumed to be completed by 2011; 2) construction and operation of the Yukon Avenue Connection across the landfill by 2016; and 3) construction and operation of the completed East Park Road network after 2016 by 2036.

#### *COORDINATION WITH DSNY*

As stated above, Fresh Kills Park is a large, multi-phased project. In accordance with agreements between the City and State of New York and the permits and approvals issued to the City, DSNY is obligated to complete final closure at Landfill Section 6/7 (and then followed by Landfill Section 1/9 to the west). DSNY will then continue to operate and maintain the landfill environmental control systems, and perform the required monitoring and maintenance in accordance with the Fresh Kills Landfill Post-Closure Monitoring and Maintenance Operations Manual for a period of at least 30 years. DSNY would be the City agency responsible for that compliance until such time as compliance requirements may be transferred to DPR or another entity with the approval of DEC.

#### **PERMITS AND APPROVALS**

There are many City, State, and Federal land use and environmental approvals that are necessary to construct the proposed East Park roads. With respect to City regulations, approvals include amending the City Map to map a public place that would serve as the right-of-way for proposed roads, and a zoning map amendment to assign a zoning district (M1-1) to the areas being mapped as public place. These mapping and zoning actions are part of a larger ULURP action for Fresh Kills Park.

At the State level, approvals necessary for the proposed project include modifications to the approved Fresh Kills Landfill Final Closure Plan; Part 360 landfill closure approvals for end use;

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permits for activities in wetlands; and permits for protection of waters. Federal approvals would apply to constructing structures over or in navigable waterways or activities in wetlands as delineated in accordance with U.S. Army Corps of Engineers (USACE) procedures.

A State legislative action was previously approved for the alienation of parkland along these segments of proposed road corridors passing through mapped parkland (Chapter 659 of the 2007 Laws of the State of New York).

### **ENVIRONMENTAL REVIEW PROCESS**

This SEIS has been prepared in conformance with applicable laws and regulations, including Executive Order No. 91 of 1977 and the Rules of Procedure for City Environmental Quality Review (CEQR). It has also been prepared in conformance with Article 8 of the Environmental Conservation Law (the State Environmental Quality Review Act [SEQRA]) and its implementing regulations found in Part 617 of Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR Part 617) and follows the guidance of the *CEQR Technical Manual* (October 2001) and the National Environmental Policy Act (NEPA). DPR is the lead agency in preparing this SEIS with the assistance of other City agencies. This SEIS contains a description of the proposed project and its related actions, including the project site and its environmental setting. It examines the short- and long-term environmental impacts of the proposed project for the two analysis years, and identifies and discloses any significant adverse environmental impacts. This SEIS also presents and analyzes alternatives to the proposed project and describes the mitigation measures necessary to minimize, eliminate, or avoid significant adverse environmental impacts that could occur with the proposed project. As described below, implementation of the proposed project requires multiple discretionary actions. This SEIS has been prepared to address the environmental issues and impacts related to road development decisions to be made by the Lead Agency (DPR) and other involved agencies in order for road construction to proceed.

### **FRESH KILLS SITE AND REGULATORY HISTORY**

#### *SITE HISTORY*

Before solid waste landfilling operations began at the Fresh Kills property, the natural conditions at the project site were primarily coastal marsh and creeks. In 1948, to address its increasing solid waste disposal needs, the City of New York opened the Fresh Kills Landfill as part of a network of municipal solid waste landfills that were developed to serve the dual purposes of municipal solid waste disposal and land reclamation. In the decades that followed, Fresh Kills became the City's principal landfill facility for the disposal of collected household and commercial and municipal solid waste and construction and demolition debris. While the City had a number of operating landfills through the latter half of the 20th century, many were closed as new environmental regulations came into effect. By 1991, Fresh Kills was the City's only operating landfill. By the mid-1990s it had grown into the largest landfill in the world. At its peak, Fresh Kills received as many as 29,000 tons of solid waste per day.

Landfill operations at Fresh Kills commenced before existence of Federal and State regulations governing the design and operation of solid waste landfills. With the promulgation of new federal statutes, such as the Resource Conservation and Recovery Act (RCRA) in the 1970s, federal guidelines were established for the siting, design, operation, closure, and monitoring of solid waste landfills. Following the passage of the Environmental Conservation Law (ECL) of New York State in 1973, stringent new regulations were adopted governing the state's solid waste landfills. These new regulations included 6 NYCRR Part 360, Solid Waste Management

Facilities, signed in 1977. To ensure that landfills throughout the state were in compliance with these new regulations, municipalities were required to apply for permits from DEC for their landfills.

DEC recognized that bringing existing landfills into compliance with new regulations would not occur immediately. To enable the Fresh Kills Landfill to come into compliance with the Part 360 regulations for solid waste management facilities, DEC entered into a consent order that allowed DSNY to continue operating the Fresh Kills Landfill while the City made environmental and operational improvements at the landfill. A review of a Part 360 permit application for Fresh Kills Landfill was subsequently terminated when a state law was passed in 1996 requiring the landfill to cease accepting solid waste by December 31, 2001. As a result, Fresh Kills Landfill continues to be governed by the consent order between DEC and the City of New York (April 24, 1990, as modified DEC Case #022-9001-89-03), which governs landfill closure at the site.

Fresh Kills Landfill received its last barge of solid waste on March 22, 2001. Subsequently, landfill closure construction has proceeded in accordance with a DEC-approved closure plan under the Consent Order. After the World Trade Center attacks of September 11, 2001, the Consent Order was amended by the Governor of New York to temporarily allow placement of materials from the World Trade Center site. No other materials were brought to Fresh Kills during this temporary suspension of the closure.

## *REGULATORY HISTORY*

### *Consent Orders*

Fresh Kills Landfill operated under a series of Consent Orders and amendments between DEC and the City of New York (acting through DSNY) that began in 1980. As described above, Fresh Kills Landfill operated as a major municipal landfill for several decades prior to the enactment of Federal and State laws regulating the management, handling, and disposal of solid waste materials. After these laws took effect, Fresh Kills, as an existing municipal solid waste facility, was in non-conformance with the standards of the new regime, particularly with respect to managing the impacts of the landfill on local groundwater and surface water, air quality, and wetlands. At the same time, however, Fresh Kills was an essential solid waste disposal facility for the City of New York, and one of the largest municipal landfills in the country. In accordance with those Consent Orders, in January 2001, DSNY submitted to DEC a Landfill Section 6/7 Final Cover Design Report and in January 2002, DSNY submitted a Landfill Section 1/9 Final Cover Design Report. (DSNY had submitted multiple Closure Construction Certification Reports for Landfill Sections 2/8 and 3/4 between November 1995 and March 1997, and the reports for Section 3/4 were submitted between February 1996 and May 1997.) In accordance with the modified Consent Order, DSNY also submitted to DEC a Post-Closure Monitoring and Maintenance Operations Manual for the landfill on December 13, 2002. Finally, DSNY submitted a Final Closure Plan on June 5, 2003. With the exception of the Closure Construction Certification Reports for Landfill Sections 1/9 and 6/7 and Annual Landfill Closure Progress Reports, all activities required under Appendix A-15 of the Consent Order have been completed and approved by DEC.

### *Fresh Kills Landfill Permits*

The current Fresh Kills Tidal Wetlands permit (DEC ID: 2-6499-00029/000248) was issued May 26, 2004, and expires May 26, 2014. The current State Pollutant Discharge Elimination System (SPDES) permit, which regulates discharges from the Leachate Treatment Plant to the Arthur Kill (DEC ID: 2-6499-00029/00037, SPDES ID: NY 020 0867) was issued July 25, 2007, and expires February 28, 2013; however, DEC is currently pursuing a Department-

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Initiated Modification (DIM) of the SPDES permit. The proposed DEC modifications to the SPDES include the alteration of the types of water quality samples.

At the landfill, DSNY operates three flare stations (six flares) in conjunction with the landfill gas management and processing at Fresh Kills. DSNY has a Title V Air permit to cover all sources of air emissions at the landfill including these activities. The current Title V Air permit (DEC ID: 2-6499-00029/00151) was issued August 16, 2006, and expires August 15, 2011.

### **FRESH KILLS PARK COMPREHENSIVE VEHICULAR CIRCULATION PLAN**

#### *OVERVIEW*

The Fresh Kills Park vehicular circulation plan addresses a number of unusual challenges from a traffic planning and roadway design perspective, including the presence of extensive landfill infrastructure along with freshwater and tidal wetlands in the off-landfill low-lying areas. The intent of the vehicular circulation plan at Fresh Kills Park is to integrate the roads into the natural setting while providing local traffic relief, access to the park, and limiting environmental impacts to the extent possible.

The Fresh Kills Park vehicular circulation plan is designed to provide enhanced local connectivity with new east-west public road connections between Richmond Avenue on the east and the West Shore Expressway on the west, supported by a high level of interconnectivity among the various park elements. The plan takes advantage of the existing topography, with wide landscaped corridors and distinctive paving materials.

Moreover, the design guidelines for the proposed Fresh Kills road system take into account not only engineering criteria, but ecological, sustainable and aesthetic standards, park functionality, and landfill protection principles. The design process also includes use of the City's *High Performance Infrastructure Guidelines* (New York City Department of Design and Construction and the Design Trust for Public Space, October 2005).

### **DESIGN GUIDELINES FOR THE FRESH KILLS PARK ROAD SYSTEM**

#### *OVERVIEW*

The proposed Fresh Kills Park Roads and the proposed East Park roads will be designed to meet the following goals:

- Improve local traffic flow and circulation, reduce congestion and enhance connectivity by implementing public park roads through the park.
- Provide local vehicular access to the park as well as through the park with connections along Richmond Avenue and the West Shore Expressway as a means to provide local traffic relief.
- Create a consistent road design with respect to geometry, width, materials, edging, lighting, signage, and markings that collectively identify the road as a park feature.
- Site roads above flood elevations and outside wetlands and wetland buffers (wherever possible while meeting project objectives) and avoiding or minimizing negative impacts on wetlands, woodlands, and other ecological habitats and resources.
- Provide scenic views of the park's natural landscapes and features from the road while limiting the visual and physical intrusion of the road.

- Design the park roads within a landscape corridor that would provide a buffer and stormwater management system for road runoff.
- Provide an integrated and comprehensive stormwater management design that not only manages stormwater runoff, but provides water quality and habitat benefits.
- Buffer pedestrian paths and bikeways from the road and provide safe and appropriate crossings at these road intersections.
- Maintain the integrity and functions of the Fresh Kills Landfill Section 6/7 infrastructure and avoid and minimize impacts to the landfill systems through the design and construction of the proposed road embankments as well as in the design, construction and operation of the proposed East Park Road segments that cross the landfill and its environmental infrastructure.
- Use sustainable and durable materials.

### ROAD DESIGN GUIDELINES

#### Engineering Considerations

The typical four-lane (60-foot-wide) park road section is comprised of four 11-foot-wide travel lanes, a flush, 4-foot, textured median, and two 6-foot-wide outside shoulders, which may also be textured. The shoulders contribute to improved sight distance along the inside of curved roadway segments and help keep the roadside clear of hazards. The two-lane-wide park road option would have two 12-foot-wide travel lanes with 6-foot shoulders and a 4-foot median for a total of about 40 feet.

The park road pavement is expected to be a flexible asphalt surface, with binder, base, and subbase courses supported by an embankment. Special attention is needed to design and prepare the embankment across the landfill (as outlined in 6/7 Final Cover Design Report Addendum 1) and to integrate sustainable materials and principles. Side slopes of 1 vertical and on 4 horizontal or flatter are to be provided where possible; however, site conditions necessitate fairly extensive use of 1 on 3 (and 1 on 2) slopes to minimize intrusion into wetlands and to minimize landfill impacts. Swales would also be used to manage runoff and to prevent landfill runoff from affecting the roads.

#### Park Road Crossings

The proposed park roads would pass through a variety of park uses, including passive and active recreation areas, with pedestrian/bicycle crossings at the multipurpose paths, hiking trails, and landfill service roads. The safety of pedestrians, cyclists, DPR and DSNY maintenance workers, and motorists is a paramount design consideration for these crossings. Factors in the design of the crossing would be selection of crossing locations, signage, lighting, signals, and pavement markings, all of which would be factors in developed crossing designs with the appropriate vehicular and pedestrian safety considerations.

#### Lighting

The park roads would be provided with the necessary street lighting. Appropriate lighting design would be determined in coordination with NYCDOT and NYSDOT and as part of the detailed road design phase.

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### *Road Management and Maintenance*

Road management and maintenance at Fresh Kills Park will require a special maintenance program that is expected to be different from typical city street maintenance programs. As DPR, NYCDOT, the Department of Design and Construction (DDC) and DSNY collaborate on the road designs, the agency responsible for the maintenance practices and programs will be determined. As stated above, DSNY would be the City agency responsible for monitoring and maintenance activities relative to the landfill systems until such time as compliance requirements may be transferred to another entity with the approval of DEC.

### *Landfill Crossing Design Guidelines*

The principle objective of the park road design over the Landfill Section 6/7 is to not compromise the function or integrity of the landfill cover, infrastructure, or the environmental control systems. The design, therefore, must meet engineering standards that are consistent with approved landfill closure cover designs and are subject to DSNY review and DEC review and approval. Both agencies will need to approve all designs through final detail and construction.

Fresh Kills Landfill infrastructure must also remain accessible to DSNY until the landfill post-closure phase is complete. Landfill monitoring and maintenance will be ongoing for many decades to come (a minimum period of 30 years) in accordance with the Post Closure Care Plan.

## **PROPOSED FRESH KILLS PARK ROAD SYSTEM<sup>1</sup>**

### *INTRODUCTION*

The proposed Fresh Kills Park primary road system comprises the West Shore Expressway (Route 440) Corridor, the Confluence Loop Park Road, and the three proposed public road connections to Richmond Avenue, at Yukon Avenue, Forest Hill Road and Richmond Hill Road.

### *PROPOSED WEST SHORE EXPRESSWAY ACCESS IMPROVEMENTS*

The West Shore Expressway is part of the regional highway network. It runs north/south through the Fresh Kills property within a 400-foot-wide right-of-way under NYSDOT jurisdiction. The proposed Fresh Kills Park project as analyzed in the FGEIS includes modifications along the West Shore Expressway between Arthur Kill Road on the south and Victory Boulevard on the north. These proposed modifications would provide the opportunity for regional access to the park, as well as improved local circulation to and across the park with connections to Richmond Avenue. Proposed improvements along the West Shore Expressway include new and extended service roads, new ramps, and ramp relocations. The West Shore Expressway mainline would not be affected beyond the adjustments needed to accommodate new or modified ramp termini.

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<sup>1</sup> Sources: Sources used in this description include the *Conceptual Roads Report*, Fresh Kills Park, Phase 3A, Task 8.3, prepared by Arup et al., for DPR (September 6, 2007); the *100 Percent Schematic Report* and the *Fresh Kills Park Road Alternatives Report*, prepared by Arup et al., for DPR (January 2008); the *Fresh Kills Park Bridge Alternatives Report*, Phase 3A Tasks 8.4.3 and 8.4.5, prepared by Arup for DPR (November 2007); and “Contract Drawings for the Construction of the NB/SB West Shore Expressway Service Roads and Vicinity” (40 percent submission), HDR/Daniel Frankfurt for DPR, (September 11, 2008). Appendix B to this SEIS also includes a full set of park road schematic drawings.

### *PROPOSED CONFLUENCE LOOP PARK ROAD*

The proposed loop road around the Park's central planning area is referred to as the Confluence Loop Park Road. This will be the primary hub and vehicular circulation element within the Park. The Confluence Loop Park Road will connect the entire park road system, providing the means by which to access all areas of the Park as well as the West Shore Expressway.

The Confluence Loop Park Road alignment has been selected based on both natural and manmade conditions. Its alignment is defined primarily by existing DSNY roads and bridges—including two existing DSNY bridges across Main and Richmond Creeks. Currently these bridges provide access for DSNY vehicles only. Under the proposed Fresh Kills Park project, these bridges would be modified to become part of the public road system.

### **EAST PARK ROAD SYSTEM**

#### *OVERVIEW*

The proposed East Park Road System would provide new roads across East Park with up to three needed connections to Richmond Avenue: with new connections at Yukon Avenue, Forest Hill Road, and Richmond Hill Road. These connections would provide gateways into the park and would link Richmond Avenue on the east with the Confluence Loop Park Road and the West Shore Expressway on the west.

The through roads between the proposed Richmond Avenue connections and the connection to the Confluence Loop Park Road would, in one option, have two crossings of Landfill Section 6/7—one crossing would extend Yukon Avenue westward and the other would extend Forest Hill Road westward. In another option the through road is an East Park Loop Road around the base of Landfill Section 6/7 with only one connection over the landfill, the Yukon Avenue Connection. The full build out of the completed East Park Road system will depend upon future need and DPR's further investigation of the traffic benefits and potential environmental impacts associated with these options. A description of these East Park Road system is presented below.

#### *YUKON AVENUE CONNECTION*

The proposed project would extend Yukon Avenue west into the park from its existing intersection with Richmond Avenue. From this intersection, the park road would extend across East Park (i.e., Landfill Section 6/7) to connect with the Confluence Loop Park Road near the Richmond Creek Bridge. This proposed park road would traverse Landfill Section 6/7, DSNY service roads and proposed recreational paths, and also cross Landfill Section 6/7. For the purposes of this SEIS, this connection is referred to as the Yukon Avenue Connection. Total length of the Yukon Avenue Connection (between Richmond Avenue on the east and the Confluence Loop Park Road on the west) is about 2,600 linear feet.

#### *FOREST HILL ROAD CONNECTION*

##### Landfill Section 6/7 Crossing Option

The proposed project would also extend Forest Hill Road west into the park from its existing intersection with Richmond Avenue. From Richmond Avenue, this park road would continue west across East Park to connect with the Confluence Loop Park Road. This proposed park road would traverse wetlands, Landfill Section 6/7, DSNY service roads and proposed recreational

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paths. It is anticipated that a viaduct or culvert structure would be used for the road segment over the wetlands. For the purposes of this SEIS, this connection is referred to as the Forest Hill Road Connection. Total length of this road segment (between Richmond Avenue on the east and the Confluence Loop Park Road on the west) is about 4,420 linear feet.

### *East Park Loop Road Connection Option*

Under this option, the Forest Hill Road Connection would extend west from the intersection of Richmond Avenue/Forest Hill Road into the park where, under this option, it would connect with the East Park Loop Road on the west side of the landfill for the purposes of connecting to the Confluence Loop Park Road. The East Park Loop Road alignment essentially utilizes the current DSNY service road alignment which runs along the southern edge of Landfill Section 6/7, at the landfill base and adjacent to the Richmond Creek wetlands.

## *RICHMOND HILL ROAD CONNECTION*

### *North/South Alignment Option*

The Richmond Hill Road Connection would extend west from the intersection of Richmond Avenue/Richmond Hill Road into the park where, under this option, it would, quickly turn south, passing through an existing DSNY retention pond and stormwater Basin B1, connect at its southern terminus with the Yukon Avenue Connection. Once in the park, the Richmond Hill Road connection quickly turns south, passing through an existing DSNY retention pond and stormwater Basin B1. This alignment then turns east and runs adjacent and parallel to the existing berm along Richmond Avenue, before turning west again to cross Basin B1 where it meets the Yukon Avenue Connection. Total length of this road segment (between Richmond Avenue on the north and the Yukon Avenue Connection on the south) is about 4,990 linear feet.

### *East Park Loop Road Connection Option*

Under this option, the Richmond Hill Road Connection would extend west from the intersection of Richmond Avenue/Richmond Hill Road into the park where, under this option, it would connect to the East Park Loop Road and the Yukon Avenue Connection on the west side of the landfill for the purposes of connecting to the Confluence Loop Park Road. The East Park Loop Road essentially utilizes the current DSNY service road alignment, which runs along the alignment that is currently the DSNY service road. This alignment runs along the northern and western edge of Landfill Section 6/7, at the landfill base and adjacent to the Main Creek wetlands. Total length of this road segment (between Richmond Avenue on the north and the Yukon Avenue Connection on the south) is about 5,015 linear feet.

## **DESCRIPTION OF PARK VEHICULAR CIRCULATION: 2011, 2016 AND 2036**

With the proposed road improvements in place, the proposed project would improve local vehicular circulation patterns, as well as provide access to the park. The goal of the overall Fresh Kills Park circulation system is to bring drivers to the center of the site, where they connect with the Confluence Loop Park Road, from which the West Shore Expressway and all five park areas are accessible. An overall description of the park vehicular circulation for the three analysis years is provided below.

CIRCULATION PATTERNS (2011)

In 2011, it is assumed that two 60-foot-wide road embankments (for the Yukon Avenue and Forest Hill Road Connections across the landfill) would be completed across Landfill Section 6/7 in accordance with the proposed Landfill 6/7 Final Cover Design Report, Addendum 1. Within the embankment width, 15-foot-wide landfill service roads would be constructed to meet the DSNY access requirements post closure care operations and maintenance. However, it is not assumed that the park roads are completed and operating. Therefore, in 2011 there would be no public road or vehicular circulations patterns in East Park (other than the landfill service roads and the limited DSNY traffic).

CIRCULATION PATTERNS (2016)

- By 2016, a new park road entrance would be operating at the Yukon Avenue/Richmond Avenue intersection. This entrance would lead directly to and from the commercial center along Richmond Avenue. The Yukon Avenue Connection would provide access to the Confluence Loop Park Road, Creek Landing, and the West Shore Expressway. This segment of road would extend over Landfill Section 6/7.
- From the West Shore Expressway, northbound drivers would reach the park or Richmond Avenue/Yukon Avenue by exiting the highway via a proposed ramp just north of Arden Avenue. This ramp connects with the proposed West Shore Expressway northbound service road. In turn, the service road intersects with the Confluence Loop Park Road, providing access to other parts of the park. In addition, a new entrance ramp from the northbound service road into the main line is proposed approximately 1,800 feet north of the off ramp to better serve departing park patrons and neighboring traffic.
- From the West Shore Expressway, southbound drivers would reach the park and Richmond Avenue/Yukon Avenue by exiting from the highway at the existing ramp just north of Victory Boulevard. Drivers would continue south across Victory Boulevard and onto a segment of road that is currently open only to DSNY and authorized vehicles accessing the Staten Island Waste Transfer Station. Under the proposed project, this service road would allow public access and would connect with the Confluence Loop Park Road. Drivers seeking to reach the Richmond Avenue/Forest Hill Road intersection would turn east, pass under the West Shore Expressway bridges, travel across the Main Creek Bridge, follow the east leg of Loop Park Road, and continue east to Richmond Avenue.
- The Fresh Kills Park project would also construct a ramp from the southbound service road to the expressway beginning at a location just south of Arden Avenue and connecting with the West Shore Expressway southbound main line. Construction of this access ramp would require that the existing exit ramp to Arthur Kill Road be relocated to north of Arden Avenue.

CIRCULATION PATTERNS (2036)

Provided below is a description of the circulation patterns with the completed East Park road system. As stated above, 2036 is the analysis year in the SEIS, not the completion year for construction of the proposed roads. DPR would commence with construction of the completed East Park road system after completion of the 2016 Yukon Avenue Connection and once a final road alignment has been selected from the options presented in this SEIS. That being said, three new points of entry and exit from the park to Richmond Avenue are under consideration for the purposes of providing access to the park and improving local vehicular circulation for the

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community. Therefore, with the proposed completion of the East Park road system, there would be the following improvements in local circulation:

- As stated above, there would be a connection at Yukon Avenue by 2016. This would provide a direct connection to Richmond Avenue. With one of the long-term road options under consideration, the Yukon Avenue Connection would be expanded from a two-lane park road to a four-lane park road.
- The Forest Hill Road Connection would provide access to the Confluence Loop Park Road via either the Richmond Creek or Main Creek Bridges. (Alternatively, rather than crossing Landfill Section 6/7, this park road segment would connect to a two-lane East Park Loop Road to be constructed around the base of Landfill Section 6/7.) To reach the southbound West Shore Expressway, drivers would continue west to the Confluence Loop Park Road south leg, cross the Richmond Creek Bridge, drive under the West Shore Expressway, and turn left onto the West Shore Expressway southbound service road. Drivers would continue south on the service road past Arden Avenue to a proposed ramp entrance into the West Shore Expressway main line, or stay on the service road to reach local destinations (e.g., Arthur Kill Road). To reach the northbound West Shore Expressway, drivers would make a right turn at the Confluence Loop Park Road to access the service road on the east side of the West Shore Expressway that crosses Victory Boulevard to the northbound main line.
- In addition to the entrances at Yukon Avenue and Forest Hill Road, a new park road entrance would also be located at the Richmond Hill Road/Richmond Avenue intersection. This proposed connection would also provide access to the Confluence Loop Park Road at the center of Fresh Kills Park via either the Richmond Creek or Main Creek Bridges. To reach the southbound West Shore Expressway, drivers would travel south to the Yukon Avenue Connection and then connect to the Confluence Loop Park Road south leg, across the Richmond Creek Bridge, drive under the West Shore Expressway, and turn left onto the West Shore Expressway southbound service road. Drivers would continue south on the service road past Arden Avenue to a proposed ramp entrance into the West Shore Expressway main line, or stay on the service road to reach local destinations (e.g., Arthur Kill Road). To reach the northbound West Shore Expressway, drivers would make a right turn at the Confluence Loop Park Road to access the service road on the east side of the West Shore Expressway that crosses Victory Boulevard to the northbound main line.

### **PARK ROAD STORMWATER MANAGEMENT PLAN**

There are a number of proposed park features that, if constructed, would convert existing pervious surfaces to impervious surfaces, including the proposed park roads both on and off the landfill section. Because impervious surfaces do not allow precipitation to infiltrate directly to the soil, road runoff is typically conveyed via a drainage swale or storm sewer system, to a receiving waterbody.

For the proposed East Park Roads, the stormwater management plan objective is to complement and enhance the aesthetic and natural features of the park while avoiding impacts to landfill infrastructure. To that end, the proposed stormwater design approach includes a mix of conveyance, control and treatment practices under a “Low Impact Development” design. This approach is proposed to both reduce runoff and pollutant loadings by managing the runoff at the source, which will facilitate the use of natural systems to achieve stormwater treatment requirements, along with volume control beyond that required through both infiltration and evapotranspiration. Implementation of these techniques would minimize the potential for significant adverse impacts to water quality and aquatic resources due to road runoff.

Another design objective is to conform to the drainage plan flow patterns to the stormwater system developed for the landfill. For example, road runoff would be directed to existing or proposed swales, or to the new swales installed along proposed roads and ultimately to the Landfill Section 6/7 stormwater basins where it would be detained and treated prior to discharge. Where road embankments interfere with drainage swales along the perimeter of the landfill or at downchutes, culverts would be installed beneath proposed roads to retain existing drainage patterns to sediment basins.

In park road segments crossing wetlands (e.g., the Forest Hill Road Connection), either viaducts or culverts are proposed to convey stormwater and maintain connectivity on each side of the roadway. New Best Management Practices (BMPs) would also be installed where necessary (e.g., at the east end of the Forest Hill Road Connection) for the purposes of providing natural stormwater management features that can support and enhance existing wetland systems.

In this way, the proposed stormwater management plan for the East Park roads would utilize the Landfill Section 6/7 stormwater management systems and retrofit the existing basins with new Best Management Practices (BMPs) that would meet the drainage and water quality treatment needs of the proposed park roads.

Design and implementation of the proposed East Park Roads stormwater management system would require coordination between DPR and DSNY both through design and construction, as well as approvals from DEC.

## **EAST PARK ROADS: PROJECT PURPOSE AND NEED**

### *ADDRESSING THE TRAFFIC NEEDS*

#### *Increasing Regional Connectivity*

There is an undeniable need to address traffic congestion on Staten Island. Traffic in this part of Staten Island is particularly heavy and that congestion is only expected to increase as western Staten Island continues to grow and develop. In response to growing community concerns about traffic, the City of New York created the Staten Island Transportation Task Force which is a multi-agency task force led by representatives from NYCDOT and DCP (also represented are local community boards, NYSDOT, MTA and the Port Authority of New York and New Jersey [PANYNJ]). Formed in 2006, the Task Force is charged with exploring multiple short- and long-term opportunities and solutions for improving transportation and circulation across Staten Island. The Task Force has identified the construction of the Fresh Kills Park roads as one of its key recommendations for relieving local traffic congestion in addition to transit, alternative transportation modes, and other road improvement projects that are being implemented and considered for the area.

#### *Minimizing Local Traffic Impacts*

Given the lack of operational capacity along the heavily congested Richmond Avenue alternative travel routes that reduce congestion along this corridor are needed. During the course of the preparation of the *Fresh Kills Park FGEIS* and this SEIS (including the GEIS public hearings and the SEIS public hearings), numerous comments were put forth by local representatives and the general public with respect to the need for not only new east/west public roads as part of the Fresh Kills Park project, but also for expediting the construction. With no public through road across Fresh Kills, there is a major local need for a shorter travel distance

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through (rather than around) the approximately 4-square-mile, 2,200-acre Fresh Kills property. Fresh Kills currently presents a significant void in the local street grid, and therefore is a significant obstacle to local drivers seeking to reach the West Shore Expressway and the regional highway system. While the proposed park would be served by publicly accessible roads for automobile and transit access into the park, the connections to the West Shore Expressway would simultaneously provide a public through road across the proposed Fresh Kills Park, thereby providing some measure of local traffic relief.

By way of background, in 2001, with the official closing of Fresh Kills Landfill, the office of the Staten Island Borough President, through the New York City Economic Development Corporation, commissioned a study of alternatives for providing vehicular access across Fresh Kills. Among the findings of that study were that roads through Fresh Kills could provide traffic relief on local streets. By implementing new east/west connections that would provide direct access to the West Shore Expressway and bypass the congested Richmond Avenue corridor, the study concluded that intersections along Richmond Avenue would experience reductions in vehicular congestion if new roads were to be constructed across Fresh Kills. These improved traffic flows were determined to be directly linked to a shift in traffic patterns from the Richmond Avenue corridor (between Arthur Kill Road on the south and Victory Boulevard on the north) to public roads across Fresh Kills. Thus, with park roads, not only would congestion be reduced at local intersections, but vehicle miles traveled would be reduced with the potential for accompanying air quality benefits.

Based on that report as well as additional data collected and research undertaken for this SEIS as to the purpose and need for the proposed park roads, it is concluded that the proposed East Park roads are justified. These roads can reduce overall vehicular travel time for the local community with more direct (shorter) travel paths, while also reducing congestion on local streets. These benefits would occur at multiple locations, but particularly along the Arthur Kill Road, Drumgoole Road West, Richmond Avenue, Richmond Hill Road, and Forest Hill Road corridors. The proposed park roads would also eliminate the need for vehicles to travel through the quiet residential neighborhoods adjacent to the Fresh Kills Park site, such as the Travis neighborhood to the north.

Lastly, by reducing local travel time and congestion, the proposed park roads would also provide the benefit of emergency access to and across the site as well as economic and community benefits with improved circulation.

### *Providing Park Access*

Another goal of the proposed park roads is to provide access into the park and to the various uses distributed throughout the park. The primary roads are designed to provide vehicular access to those uses which will generate the greatest demand, such as the recreational center proposed for the Confluence.

## **EAST PARK ROADS: DESCRIPTION OF THE PROJECT SITE, CURRENT AND FUTURE CONDITIONS**

### *BLOCKS AND LOTS*

The project site is City-owned land comprising Block 2520, Lot 1. The property is under the jurisdiction of DSNY.

*CURRENT ZONING AND MAPPED PARKLANDS*

The proposed East Park has one underlying zoning district, R3-2. This zoning district covers all of Landfill Section 6/7. Open space and recreational facilities are allowed in the R3-2 districts. Where the site is mapped parkland, this zoning designation does not apply. There is also a City special zoning district mapped over a portion of the project site (the mapped parkland along the waterfronts of Main and Richmond Creeks), the City's Natural Area District (NA-1). The NA-1 District connects with the William T. Davis Wildlife Refuge to the north and LaTourette Park to the east. This Special Zoning district was created in the 1970s to preserve the unique natural landscapes and topography of Staten Island.

Portions of the project site are currently mapped as parkland. Although mapped as parkland, the areas are not developed with recreational facilities and are not publicly accessible.

Because the proposed roads would, in part, pass through existing mapped parkland on the project site, a State legislative action was approved for the alienation of parkland along proposed road corridors (Chapter 659 of the 2007 Law, State of New York).

**CURRENT LAND USES, STRUCTURES AND OPERATIONS**

*LAND USES*

The project site is all City-owned land, all of which is under the jurisdiction of DSNY. In addition to the landfill and its associated infrastructure (e.g., drainage basins), there is undeveloped land, including landfill buffer lands and a constructed berm fronting on Richmond Avenue. Richmond Creek and Main Creek form the southwest and northwest boundaries of the site.

*FRESH KILLS LANDFILL SYSTEMS*

There are four landfill sections at Fresh Kills: Landfill Sections 3/4, 6/7, 2/8 and 1/9. The project site is within Landfill Section 6/7.

The landfill sections, or SWMUs, at Fresh Kills were once used by DSNY for the landfilling of municipal and household solid waste. These landfill sections are regulated by DEC as SWMUs because they contain solid waste. In accordance with RCRA, the SWMUs are defined by areas where waste was placed after 1980. In addition to the SWMUs, the project site contains accessory DSNY facilities, such as drainage basins, and landfill gas migration and groundwater monitoring wells that are part of the Fresh Kills environmental protection system and post-closure monitoring program (see the discussion below). These environmental protection systems and the monitoring and maintenance program for Fresh Kills Landfill are being implemented by DSNY. Under the monitoring and maintenance obligations, monitoring data is collected by DSNY and submitted on a regular basis to DEC for review. Lands that contain the environmental monitoring facilities are within the Fresh Kills environmental compliance boundary (i.e., the lands outside the SWMUs that serve as a buffer between the SWMUs and surrounding properties).

Final closure construction is underway at Landfill Section 6/7 in accordance with a DEC-approved design. Final closure construction includes a final cover designed to minimize water infiltration and gas releases with a soil/geomembrane layer and vegetative cover that minimizes erosion. There is also a comprehensive network of drainage structures to collect surface water runoff.

*POST-CLOSURE MONITORING AND MAINTENANCE OPERATIONS MANUAL<sup>1</sup>*

In accordance with the requirements of the State of New York including 6 NYCRR Part 360 and the Order on Consent between DEC and DSNY, a *Post-Closure Monitoring and Maintenance Operations Manual* (the Manual) was prepared for Fresh Kills Landfill to provide all information necessary to effectively monitor and maintain Fresh Kills for the entire post-closure period. Under the requirements of the *Post-Closure Monitoring and Maintenance Operations Manual*, the City is required to perform a variety of measures to ensure that closure and post-closure monitoring and maintenance of the landfill occurs in compliance with 6 NYCRR Part 360.

*DSNY FACILITIES ADJACENT TO THE PROJECT SITE*

DSNY operates a number of essential solid waste and sanitation management facilities at Fresh Kills that support ongoing solid waste management services and operations for the Borough of Staten Island. These include the Staten Island Waste Transfer Station, as well as two local Sanitation Districts 2 and 3 facilities that are located adjacent to, but outside, the boundaries of the proposed park. The DSNY District 2 garage is adjacent to the project site, off Richmond Avenue near Richmond Hill Road, and serves DSNY's Staten Island Sanitation District 2.

**FUTURE CONDITIONS AT THE PROJECT SITE WITHOUT THE PROPOSED PROJECT**

In the future without the proposed project, it is assumed that final closure construction at Landfill Section 6/7 would be completed in accordance with the currently approved plan. The phasing plan for the final closure of Landfill Section 6/7 includes four sequences of closure construction covering about 60-80 acres each. Final landfill closure construction is intended to be completed by 2010 at Landfill Section 6/7. As part of that final cover construction, the vegetation and drainage systems are also installed. As of September 2009, Phase 1 and 2 closure construction activities have been completed.

While the closure construction would be completed and the monitoring and maintenance program for Fresh Kills Landfill underway, in the future without the proposed East Park roads project, there would be no public roads provided in East Park. In the future without the proposed park, it is also assumed that DSNY would continue use of all needed facilities currently on site for at least 30 years.

**SEIS: FRAMEWORK FOR ENVIRONMENTAL IMPACT ANALYSIS**

The proposed East Park roads project and its related discretionary actions are the subject of this SEIS. Under CEQR/SEQRA, environmental impacts of a proposed project (or action) are measured against a background of "No Build" conditions, which is referred to in this document as the "Future Without the Proposed Project." No Build conditions are the conditions that are expected to exist at the time in the future when the proposed project construction would be

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<sup>1</sup> The source for the information provided below is the *Fresh Kills Landfill Post Closure Monitoring and Maintenance Operations Manual*, prepared by Roy F. Weston of New York, Inc. for DSNY, December 3, 2002. This is a summary description. A more detailed description of the Manual is provided in the Fresh Kills Park FGEIS.

complete and/or when the project would be in operation, but with the assumption that the proposed project does not occur.

As stated above, for the East Park Roads project, there are three major phases and analysis years. The three analysis years are 2011, 2016, and 2036 for both the No Build and Build conditions. These three year analysis years reflect each of the following project elements:

- By 2011, completion of a grading plan with a road embankment to accommodate potential future public roads as part of the final landfill cover at Landfill Section 6/7, in accordance with the “Fresh Kills Park Landfill Section 6/7 Final Cover Design Report, Addendum 1 (Geosyntec, September 2009)—this phase is assumed to be completed as part of the final closure construction at Landfill Section 6/7;
- By 2016, completion and operation of the Yukon Avenue Connection as a two-lane public road, crossing Landfill Section 6/7 and connecting on the east with a new intersection at Richmond Avenue and on the west with the Confluence Loop Park Road, which in turn would provide access to the West Shore Expressway; and
- After 2016, completion of the East Park road system with the implementation of one of the options presented in this SEIS: four- or two-lane roads across East Park with new connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road; widening the Yukon Avenue Connection from two lanes to four lanes; or a two-lane loop road around the base of Landfill Section 6/7 (reusing the alignment of the existing service roads), which is referred to in this SEIS as the East Park Loop Road, with connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road. Operation of the completed East Park road network has been analyzed in this SEIS as a 2036 analysis year.

The 2016 and 2036 analysis years presented in this SEIS correspond to the analysis years presented in the Fresh Kills Park FGEIS (March 2009). These years are not the completion years for road construction (i.e., road construction could be completed earlier), rather they are analysis years by which the phases of the East Park roads and overall Fresh Kills Park would be completed and are therefore appropriate analysis years for providing a comprehensive impact analysis of natural resources, traffic, air quality, and noise conditions (for example).

With respect to the future No Build conditions assumed in this SEIS, in the absence of the proposed project, it is assumed that DSNY would move forward with construction of its approved final cover design at Landfill Sections 6/7. In addition, DSNY would also have all environmental monitoring facilities in place and would continue to implement its Fresh Kills Landfill environmental maintenance and monitoring program through the 2016 and 2036 analysis years (and beyond, as required). Additional No Build assumptions include:

- Build-out of Fresh Kills Park through the 2016 and 2036 analysis years, as described in the *Fresh Kills Park FGEIS* (March 200); and
- Build-out of Fresh Kills Park roads west of East Park through the 2016 and 2036 analysis years, as described in the FGEIS, including the connections and ramps associated with the West Shore Expressway and the Confluence Loop Park Road.

The essential purpose of CEQR/SEQR is to provide decision-makers at the City, State, and Federal levels with an examination of the full range of environmental issues and impacts at the earliest time possible to inform their decision-making during the development of a project, in this case the Fresh Kills Park East Park Roads project. The project concept should therefore be

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sufficiently defined so these decision-makers are capable of performing a meaningful examination.

DPR issued the Fresh Kill Park FGEIS in March 2009 which comprehensively examined the impacts of the Fresh Kills Park project in its entirety, including the proposed East Park and its park road/circulation system. That FGEIS serves as a background condition to this document. This SEIS has been prepared to provide additional data on the East Park Roads proposal, with designs and impact analyses to inform decisions that need to be made with respect to the proposed East Park Roads.

The proposed East Park Roads project involves the construction of approximately two miles of new public roads and is a long-term project with several decades of build-out, involving multiple actions and approvals. Segments of the Yukon Avenue and Forest Hill Road Connections to Richmond Avenue must cross Landfill Section 6/7, which is currently in the process of final closure construction (the northern phases of closure construction). However, there are significant fiscal and environmental benefits to modifying the southern phases of the landfill closure program to accommodate the potential park roads, rather than retrofitting the closed landfill to accommodate the proposed roads at a future date. (These benefits are described in this SEIS in Chapter 22, "Alternatives.")

This SEIS has been prepared to examine the impacts of this proposal (including modification of the landfill closure design to incorporate a proposed road embankment) and its related secondary (or subsequent) actions of constructing the proposed East Park roads. It has been prepared for the purposes of informing decision-makers as to the potential environmental impacts of modifying the final cover plan and the operation of the East Park Roads, to the extent that longer-term (post 2016) park road alignment and design decisions are still under consideration by the Lead Agency at this time. This SEIS comprehensively examines the full range of impacts related to this action, including a completed road network, some segments of which may not commence construction for 10-20 years. Thus, this analysis discloses the reasonable and comprehensive environmental impacts of the proposed project, while recognizing that final decisions on the long-term designs are yet to be reached. For that reason, a range of currently known options has been fully analyzed.

For the short-term actions and decisions (e.g., a modified landfill cover design and the proposed two-lane Yukon Avenue Connection), environmental impacts have been minimized, given that there are no significant differences in the environmental impacts of preparing a road embankment across Landfill Section 6/7 for either a four-lane (60-foot-wide) park road or a two-lane (40-foot-wide) park road. In addition, the Yukon Avenue Connection uses an existing filled and disturbed road bed to connect to Richmond Avenue. For long-term phases, such as the Forest Hill Road and Richmond Hill Road connections via either a landfill crossing or the two-lane East Park Loop Road proposal, this SEIS provides full disclosure of the range of impacts for these options (and also presents alternative road alignments and widths), recognizing that decisions on these road segments are many years, if not a decade away. However, defining for SEIS analysis purposes a road option that is 60 feet wide discloses the maximum environmental impacts and also allows for flexibility and informed design decisions that would need to be reached at a later date based on future more advanced road designs coupled with permit review and other discretionary approvals that are necessary for project implementation. These future decisions will be made by weighing the anticipated environmental impacts against the project purpose and need, the range of potential alternatives and the available mitigation.

## EAST PARK ROADS DESIGN ASSUMPTIONS

### *OVERVIEW*

The proposed East Park Roads would extend across the 482-acre Fresh Kills East Park. East Park is proposed primarily to provide a large, landscaped open space. Since it fronts on Richmond Avenue, it would also serve as the point of vehicular access to Fresh Kills Park from the east.

As described in the Fresh Kills Park FGEIS, East Park is a mix of “Active Recreation-Field Sports” on the upper elevations of Landfill Section 6/7 and “Habitat with People” in the lower elevations. This includes a hilltop field and recreational fields, with landscaped successional meadow (130 acres) and mixed woodland (187 acres) communities. The stormwater basins at the base (east of) the landfill are proposed for “Habitat with People,” providing footpaths with a 12-mile multi-purpose path around the base of the landfill.

Ecological enhancements and facilities (e.g., outdoor classroom and education center) for public access are proposed for the DSNY stormwater basins east of Landfill Section (Basins B1 and B2) and the associated wetlands. Total acreage of the wetland restoration/enhancement is estimated at 13 acres. About 28 acres of the existing wetlands (in the area south of basins B1 and B2) would also be restored as tidal marsh.

### *PUBLIC TRANSIT PLAN*

It is expected that with the three proposed connections to Richmond Avenue, New York City Transit (NYCT) could expand bus service into the park from Richmond Avenue via the Yukon Avenue, Forest Hill Road or Richmond Hill Road connections. The proposed park roads would therefore need to satisfy the design requirements of NYCT for bus operations (e.g., bus stops, lane widths, turnarounds).

### *PLAN TO AVOID IMPACTS TO LANDFILL INFRASTRUCTURE AND TO PROTECT PUBLIC HEALTH*

A key objective for the Fresh Kills Park and East Park roads project is to implement the project in a way that does not conflict with protecting public health and safety. To that end, it is important to avoid and minimize impacts to landfill infrastructure and to properly design and implement any modifications that may be necessary to construct the proposed park roads. As described above, segments of the proposed East Park roads traverse Landfill Section 6/7 and the associated landfill infrastructure, including stormwater management basins and monitoring wells. DPR and DSNY would therefore collaborate in the park road design with DEC input as part of the design review and approval process. The extensive monitoring network and data collection systems with respect to landfill gas, groundwater, and surface water that are in place at Fresh Kills Landfill and will continue to be used to obtain data to verify that the engineering systems continue to protect the health of park users, visitors, and City personnel.

### *SOIL MANAGEMENT PLAN*

Development of the East Park roads is expected to require substantial volumes of soil and gravel in order to construct both the road embankment and the associated landscape corridors. Soil decisions for the proposed East Park Roads project would be made on a case-by-case basis with regard to the types of soil that may be imported as fill material to the site. (Material to be used

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for the final cover of Landfill Section 6/7 would also be guided by the “Final Cover Design Report, Addendum 1.”) Such an approach is also recommended by the New York City Department of Health and Mental Hygiene (NYCDOHMH).<sup>1</sup> In making these soil decisions, DEC will generally require the use of the lower of Part 375-6.8(b) residential and groundwater protection soil cleanup objectives, using the ecological soil cleanup objective when there are potential impacts to ecological resources. The TAGM 4046 will also be considered, as Part 375 has no soil cleanup objective for a contaminant. All deviations from these conditions would require the written approval of DEC.

### **EAST PARK ROADS PROJECT PHASING: 2011, 2016, AND 2036**

#### *PROPOSED ROAD EMBANKMENT (2011)*

By 2011, it is assumed that the grading for the proposed 60-foot-wide road embankment would be installed on Landfill Section 6/7 as part of the final closure construction and in accordance with Landfill Section 6/7 Final Cover Design Report, Addendum 1 (September 2009). Interim uses in the embankment corridors could include a meadow cover and gravel service roads for DSNY maintenance access. It is assumed that the service roads would be 15 feet wide and that the balance of the 45-foot width would be finished with a meadow grass cover in accordance with the final cover design requirements.

#### *YUKON AVENUE CONNECTION (2016)*

By 2016 the Fresh Kills Park project would develop the Yukon Avenue Connection in addition to the 2016 park road system to the west. The proposed project would extend Yukon Avenue west into the park as a two-lane park road from its existing intersection with Richmond Avenue. From this intersection, the park road would extend across East Park to connect with the Confluence Loop Park Road near the Richmond Creek Bridge. This proposed park road would cross Landfill Section 6/7 and the DSNY service roads. The overall length of the Yukon Avenue Connection is about 2,600 linear feet. Under existing conditions, the intersection of Yukon Avenue and Richmond Avenue is a T-intersection, with a southbound approach consisting of an exclusive left-turn lane and four through lanes, a northbound approach consisting of four through lanes (with the curbside lane operating as two moving lanes with a through lane and right-turn lane), and a westbound approach consisting of one left-turn and one shared left- and right-turn lane. In 2016, with the proposed project, this intersection would be reconfigured to accommodate the park road entrance/exit at Yukon Avenue and Richmond Avenue.

#### *EAST PARK ROAD SYSTEM (2036)*

##### *Introduction*

By 2036, it is assumed that at least one of the East Park roads options would be completed along with the full Fresh Kills Park road system to the west. At this time, a number of options are under consideration for the completion of the East Park road system. These options include:

- Four-lane (60-foot-wide) road connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road. These four-lane roads would extend into the site and across Landfill

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<sup>1</sup> Additional details on the Fresh Kills Park Soil Management Plan are provided in the *Fresh Kills Park FGEIS* (March 2009).

- Section 6/7 to reach the Confluence Loop Park Road and, in turn, access to the West Shore Expressway.
- Two-lane (40-foot-wide) road connections, at Richmond Hill Road, Yukon Avenue, and Forest Hill Road, within the same alignment described above. However, under this option the park roads are only two travel lanes, but widen at the Richmond Avenue intersections to provide turning lanes similar to the four lane road design.
  - Yukon Avenue only as a four-lane (60-foot-wide) road and carrying all the 2036 projected traffic.
  - A two-lane, one-way East Park Loop Road around the base of Landfill Section 6/7, providing access to the Confluence Loop Park Road as well as linking two-lane road connections at Forest Hill Road, Richmond Hill Road, and with a four-lane-wide road at Yukon Avenue. There would also be the three intersection connections at Richmond Avenue.

Background conditions common to each of these park road options is that East Park is completed by 2036, as described in the *Fresh Kills Park FGEIS*.

A more detailed description of each of the options is provided below.

#### *EAST PARK ROAD SYSTEM—FOUR-LANE ROAD OPTION (2036)*

##### *Forest Hill Road Connection (Four-Lane Road)*

This proposed project option would extend Forest Hill Road west into the park from its existing intersection with Richmond Avenue. From Richmond Avenue, this park road would extend west across East Park to connect with the Confluence Loop Park Road in the vicinity of the Richmond Creek Bridge. This segment of the proposed park road would traverse wetlands, Landfill Section 6/7, and cross DSNY service roads. It is anticipated that a viaduct and/or culvert structure would carry the proposed park road over the wetlands. For the purposes of this SEIS, this connection is referred to as the Forest Hill Road Connection.

Under existing conditions, the intersection of Forest Hill Road and Richmond Avenue is a T-intersection, with a southbound approach consisting of an exclusive left-turn lane and four through lanes, a northbound approach consisting of four through lanes, (with the curbside lane operating as two moving lanes with a through lane and a right-turn lane), and a westbound approach consisting of one left-turn and one shared left- and right-turn lane. With the proposed project, this intersection would be reconfigured to accommodate the park entrance/exit at Forest Hill Road and Richmond Avenue.

##### *Richmond Hill Road Connection (Four-Lane Road)*

Under this proposed project option, the Richmond Hill Road Connection would extend west into the park from the intersection of Richmond Avenue/Richmond Hill Road and would then turn south to connect at its southern terminus with the Yukon Avenue Connection. There already exists a short extension of Richmond Hill Road west of Richmond Avenue in the form of a 200-foot stub that currently operates as the driveway into a Duane Reade parking lot. The proposed project would modify this road segment to fit the proposed park road design.

This segment of park road would pass through existing DSNY stormwater basins and freshwater wetlands situated east of Landfill Section 6/7 and part of the landfill drainage system. The alignment crosses the basins twice, once as it shifts to the east and runs along the existing berm

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along Richmond Avenue, and again at Basin B1 where it turns west to merge with the Yukon Avenue Connection. At the basin crossings, it is anticipated that the proposed park road would have an embankment traversed by culverts designed to maintain hydraulic continuity and habitat connectivity. The segment of the road adjacent to the berm along Richmond Avenue would occupy the embankment of an existing DSNY dead-end service road that provides access to landfill-monitoring facilities. As a four-lane road, the park road would require filling of certain wetlands and basins along its length, as well as modifications of the DSNY sediment basin drainage system.

Under existing conditions, the intersection of Richmond Hill Road and Richmond Avenue is a four-legged intersection, with a southbound approach consisting of an exclusive left-turn lane, three through lanes, and one shared through-right lane, a northbound approach consisting of an exclusive left-turn lane and four through lanes (with the curbside lane operating as two moving lanes with a through lane and a right-turn lane). With the proposed project, this intersection would be reconfigured to accommodate the park entrance/exit to Richmond Hill Road at Richmond Avenue.

### *EAST PARK ROAD SYSTEM—TWO-LANE ROAD OPTION (2036)*

#### *Introduction*

The purpose of this option is to provide a narrower footprint, two-lane road (i.e., approximately 40 feet wide as compared with the 60-foot-wide four-lane road option). The principal areas of comparison between these options are the physical geometric differences between a two-lane and four-lane park road design, and the resulting potential for landfill conflicts, environmental impacts, and park design conflicts.

With respect to the Forest Hill Road and Richmond Hill Road Connections, the road coverage associated with this two-lane option would differ from that under the four-lane option in terms of magnitude and extent. For example, the width of the two-lane alternative provides an advantage for the Richmond Hill Road segment by reducing impacts to wetlands. Here, while the base of the road embankment would be approximately 80 percent as wide as the four-lane at the basin crossings, along the berm the narrower two-lane width would result in 50 percent less width into the Basin B1 and the associated wetlands.

Like the four-lane option, there would be a need to avoid, minimize, or mitigate impacts from the proposed roads with respect to the landfill infrastructure (off-mound) and wetlands. It is expected that project avoidance and mitigation measures (see the discussion below) could eliminate project impacts. This option would also achieve the project's goals and objective with respect to improving local traffic circulation, providing local connectivity, and minimizing the impacts of the proposed park on local streets.

Both the proposed four-lane road and this two-lane park road design provide a connection with a short and direct route to the Confluence Loop Park Road.

#### *Forest Hill Road Connection (Two-Lane Road)*

Under this option, the two-lane park road for the Forest Hill Road connection follows a similar horizontal alignment and profile as for the four-lane proposal. It would also have a similar intersection design. Since it would be a narrower road like the Richmond Hill Road segment (see the discussion below), this option would have less of an impact on wetlands along this alignment.

*Richmond Hill Road Connection (Two-Lane Road)*

Like the four-lane proposal, the two-lane park road option follows a similar alignment in the Richmond Hill Road Connection. The two-lane park road option exceeds the park road design criteria, except at the horizontal curve approaching the Richmond Avenue intersection, where a curve of a 300-foot radius is provided. Here, justification for retention of the non-standard horizontal curve is the same as for the four-lane proposal. Intersection design at Richmond Avenue is the same as the four-lane option.

The two lane alignment differs in the northern segment of the road from the four-lane proposal in that it reduces wetland impacts to the stream outlet from Basin A. It would also have less overall filling impact on Basin B1 and the associated wetlands/retention pond to the north as a result of its narrower width.

*YUKON AVENUE CONNECTION—FOUR-LANE ROAD OPTION (2036)*

This option is essentially a four-lane, two-way road across Landfill Section 6/7 along the Yukon Avenue Connection (widening the two-lane road proposed in 2016). With this option, neither of the connecting roads to Richmond Hill Road or Forest Hill Road are provided. This option could be implemented with minimal wetland impacts. Intersection design with Richmond Avenue would be similar to the intersection with the two-lane (2016) design, as the turning lanes would be provided for both the 2016 and 2036 intersection improvements.

*EAST PARK LOOP ROAD WITH RICHMOND AVENUE CONNECTIONS (2036)*

*Introduction<sup>1</sup>*

This option (referred to as the “SIBPO Alternative” in the *Fresh Kills Park FGEIS*), essentially calls for a two-lane loop road around the base of Landfill Section 6/7 and utilizes the alignment of the existing DSNY service roads. In addition, this option includes a four-lane Yukon Avenue Connection across Landfill Section 6/7 providing direct access to Richmond Avenue. The East Park Loop Road would have connections at three intersections along Richmond Avenue at Richmond Hill Road, Yukon Avenue and Forest Hill Road (from north to south).

This option has been put forth for the purposes of determining if such an alignment could potentially have less of an impact on the landfill systems and on-site wetlands, and therefore could possibly be implemented sooner and for less cost than other options.

This option would have similar environmental impacts to the above options, although in some cases the impacts may be of a lesser magnitude. There are also specific differences with respect to stormwater management, road geometry, landfill conflicts, impacts on tidal wetlands, and park conflicts which are summarized below.

*Road Design Objectives*

The roads proposed under this option do not entirely meet the functional classification system described by AASHTO Policy on Geometric Design of Highways and Streets (2004). For the

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<sup>1</sup> The description below is based on the report “Fresh Kills Landfill Staten Island Borough President’s Office Evaluation of Roadway Alternative in East Park (Draft Report),” URS for the New York City Department of Transportation and the New York City Department of Design and Construction, February 2009.

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purpose of determining required supplementary design criteria, the system evaluated was classified as an “Urban Collector Road.”

### *Design Speed*

Under this option, at locations where the minimum radius for 35 mph could not be accommodated, a lower design speed would be necessary with the appropriate signage (26 of the 71 curves proposed in this alternative are substandard for the proposed design speed in order to more closely follow the alignment of the existing haul roads).

### *Landfill Constraints*

There are certain road segments where minimal impacts to Landfill Section 6/7 infrastructure—including the existing and proposed gabion walls and potential leachate pumping station conflicts—would occur. Therefore, minor realignments along with other design modifications would be needed to avoid such impacts.

### *Horizontal Stopping Sight Distance*

Stopping sight distance is affected by various factors, including cut slopes and object heights. In the evaluation of this option, the location and slope of Landfill Section 6/7 was considered first, including the introduction of a three-foot-wide drainage buffer strip of the two-foot shoulder with a proposed slope of 1 vertical to 3 horizontal. The road segments where the slope represents an obstruction is when the curve is to the left (i.e., towards the landfill mound).

As a result of this analysis, any gabion walls located on a horizontal curve to the left would impact the horizontal stopping sight distance. The smallest gabion wall height is two feet, six inches tall. AASHTO’s requirement when an object would obstruct sight is two feet, therefore all gabion walls above two feet obstruct the driver’s line of sight. Also the gabion wall locations (except for one) do not meet the required horizontal sightline offset.

### *Radius of Horizontal Curve*

The minimum required horizontal curve radius is determined based on a road’s functional classification, design speed, and the superelevation rate. Based on the AASHTO Policy on Geometric Design of Highways and Streets, the minimum required horizontal curve for a two percent superelevation rate (away from the landfill mound) at a 35 mph design speed is 408 feet when the curve is to the right and 510 feet when the curve is to the left (adverse cross slope). Based on these factors, there are a number of locations where the horizontal curves do not comply with the minimum radius required.

### *Vertical Geometry*

The maximum allowable grade is also determined by its functional classification, the design speed, and the terrain. The maximum allowable grade is seven percent. The minimum desirable grade is 0.5 percent, but is ultimately controlled by the design of the drainage system.

This park road option does not exceed the maximum allowable grade; however, it also does not meet the minimum desirable grade for drainage in many locations. However, this drainage consideration could be addressed by providing a cross-slope (pitch) of two percent away from the mound along the entire roadway. The existing service road cross slope is generally two percent away from the mound, and roadway widening would be a continuation of the same cross slope. The widening will require a further examination of potential conflicts with the landfill and wetlands along Main and Richmond Creeks.

*Proposed Pavement*

To avoid impacts to the existing Landfill Section 6/7 liner, which is located approximately three feet below existing grade under the existing DSNY service roads, a proposed pavement section for this option was developed assuming the existing (service road) pavement structure remains in place. With respect to pavement:

- A flexible pavement system over the service roads, rather than rigid (concrete) or composite (asphalt overlay over unreinforced concrete base) could avoid any potential differential settlement over landfill service roads. However, service roads require widening to accommodate the two-lane width, and there are differential settlement concerns between existing and widened pavement.
- A field investigation confirmed that some landfill vents fall within the limits of pavement of this alternative roadway.

**B. PROBABLE IMPACTS OF THE PROPOSED PROJECT**

As stated above, this SEIS has been prepared to provide additional technical analyses related to the proposed East Park road elements of the Fresh Kills Park project. Therefore, many analyses presented in the *Fresh Kills Park FGEIS* (March 2009) have already examined the potential impacts of the East Park Roads project with respect to the following technical areas:

- Land Use, Zoning, and Public Policy
- Socioeconomic Conditions
- Community Facilities
- Open Space
- Shadows
- Historic Resources
- Neighborhood Character
- Hazardous Materials
- Waterfront Revitalization Program
- Solid Waste and Sanitation Services
- Energy
- Transit and Pedestrians
- Growth-Inducing Aspects
- Environmental Justice
- Irreversible and Irretrievable Commitment of Resources

For these analyses, it is concluded, like the FGEIS, that the proposed project would not have any significant adverse impacts.

A summary of the impacts associated with remaining technical analyses follows.

## NATURAL RESOURCES

### OVERVIEW

Certain off-mound segments of the proposed East Park roads have the potential to result in significant adverse impacts to natural resources. For example, construction and operation of the proposed park roads to provide a new east-west connection between Richmond Avenue and the West Shore Expressway would result in significant adverse impacts to wetlands and aquatic habitats as a result of filling and/or shading from the proposed structures or culverts. Operation of the proposed park roads also has the potential to result in indirect impacts to wildlife from road operation, including noise and light pollution, impairment of life-cycle requirements, habitat fragmentation and wildlife avoidance response, and wildlife/vehicle collisions. To minimize and avoid these impacts, measures would be integrated into park road design (e.g., the Yukon Avenue culvert design) and management techniques would be utilized to minimize the potential for adverse impacts to aquatic and terrestrial biota (e.g., monitoring, providing safe wildlife passages, and roadside landscaping and maintenance).

### Proposed Road Embankment (2011)

Implementation of the modified landfill cover would not result in significant adverse impacts to natural resources. The Landfill Section 6/7 Final Cover Design Report, Addendum 1 incorporates appropriate engineering design performance standards and approaches that are consistent with New York Part 360 landfill final closure design requirements and previous final closure designs implemented at Fresh Kills Landfill and other locations. Construction of these two proposed road embankments as part of the landfill closure construction would not result in any direct or indirect impacts to natural resources. In order to avoid runoff impacts to downstream water quality, the interim gravel roads would be limited in width to 15 feet and the balance of the 60-foot-wide embankment would be the landfill meadow cover. This would provide a more stabilized land cover and therefore reduce erosion and downstream sediment loadings.

This proposed landfill cover design is also not expected to result in impacts with respect to any of the following natural resources conditions:

- Terrestrial Resources (the site would be disturbed in the future under the approved final cover plan);
- Floodplains (there are no flood hazard areas on Landfill Section 6/7)
- Threatened or Endangered Species (there are no threatened or endangered species on the landfill section); and
- Significant Coastal Fish and Wildlife Habitat.

Landfill leachate is generated by percolation of precipitation through the landfill surface and into the waste. The percolation volume is minimized through the application of best management operating practices, and the engineered cover systems. Typical best management practices include: (i) performing waste handling operations within a limited area that can be easily managed; (ii) diverting stormwater run-on away from open waste areas; (iii) maintaining positive drainage on surfaces to prevent ponding of water; and (iv) application of temporary cover materials over waste overnight and during other periods of inactivity.

Considering that a significant reduction in leachate percolation would occur with 2011 construction of the final cover system, it is concluded that the project construction activities, in particular the proposed road embankment, performed using appropriate landfill operating standards, would not increase the volume of leachate associated with closure construction. Once the closure construction is completed, the proposed cover would be as effective as the approved cover system. Thus, the proposed final cover would not have any impacts on groundwater or surface water during either construction or operation. An examination of leachate volumes during the construction period has also disclosed that the proposal would not significantly increase leachate volumes during the construction of the proposed final cover design.

The proposed final cover plan requires additional material for grading and contouring the landfill cover to provide the proposed road corridor embankment. This includes an estimated 64,124 cubic yards of fill materials for the Yukon Avenue Connection and 65,391 cubic yards of fill for the Forest Hill Road connection. These additional fill materials would not have any natural resources impacts, as they would be deposited and graded on the already disturbed landfill. The addition of this fill would require the sedimentation and erosion protection measures under a SPDES permit for the duration of the final cover grading project; however, since these measures are in place and already permitted, and serve to minimize and avoid environmental impacts, continuation of these measures for the added construction period would not be expected to result in any indirect impacts to local water quality, wetlands, or habitats.

With respect to stormwater and water quality conditions, an assessment of the water and sediment quality for the proposed modified cover was conducted to determine the annual loading changes when compared with the “future without the proposed project” conditions discussed above.

The annual water quality and sediment loadings were calculated at the inflow to Richmond and Main Creeks, based on these flows from the storm water management basins under the proposed project for the 2011 condition. Annual loadings for the 2-year, 24-hour design storms, equivalent to 3.30 inches, were calculated. The water quality loading estimates for the 2011 final closure condition with the minimum interim road width (see the discussion above) disclosed that there would not be any impacts with the proposed final landfill cover phase of the proposed project.

#### *YUKON AVENUE CONNECTION—TWO-LANE ROAD (2016)*

This option would not have any impacts on

- Geology soils and groundwater;
- Floodplains;
- Terrestrial resources;
- Threatened and endangered species; or
- Significant coastal fish and wildlife habitats.

This option would have only a minimal potential indirect impact on aquatic resources/wetlands as a result of road runoff and habitat fragmentation in the vicinity of Basins B1 and B2. No direct impacts on wetlands or aquatic habitats would occur (e.g., filling). To avoid impacts due to habitat fragmentation, a new culvert crossing beneath the road would replace the existing culvert connecting Basins B1 and B2. The proposed culvert crossing would be designed with dimensions adequate to provide for a wildlife connection targeted towards amphibian and reptiles as well as natural substrate in the bottom of the culvert. In addition, to avoid impacts due to road runoff, Best Management Practices would be used in the stormwater basins for the

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purposes of providing runoff management and wetlands enhancement. With these measures in place, it is expected that natural resources impacts under this 2016 project phase could be avoided or mitigated.

### FOREST HILL ROAD AND RICHMOND HILL ROAD CONNECTIONS—FOUR-LANE PARK ROAD (2036)

The four lane (60-foot-wide) park road would not have any impacts with respect to:

- Geology soils and groundwater;
- Floodplains; or
- Terrestrial resources.

Under the four-lane park road option, there are changes in hydrology due to road runoff and changes in the DSNY stormwater management basins; however, the volume of runoff generated under this option could be managed on site and there would not be any adverse stormwater management or water quality impacts under this option. There would also be filling of wetlands under this option and the need for a comprehensive mitigation plan. Total impacted wetlands in this option are 2.54 acres (including 0.36 acres of shading impacts) with the Forest Hill Road Connection and 3.09 acres of filling impacts with the Richmond Hill Road Connection. Lastly, it is expected that there would be impacts related to habitat fragmentation with the proposed segments crossing over the wetlands and aquatic habitats in order to provide the Forest Hill Road Connection, the Yukon Avenue Connection, and Richmond Hill Road Connections, which traverse stormwater basins and the associated wetlands and aquatic habitats east of Landfill 6/7, and the associated wetlands). Impacts avoidance and mitigation techniques proposed above for the Yukon Avenue Connection would also need to be applied to the Forest Hill Road and Richmond Hill Road Connections. In addition, water quality protection and aquatic resources/wetlands protection would need to be implemented as part of the project design in order to avoid impacts of conflicts with any Significant Coastal Fish and Wildlife Habitats, particularly with respect to the Forest Hill Road Connection which drains to Richmond Creek to the south and the northern segment of the Richmond Hill Road Connection which drains to the north and feeds the Main Creek and the William T. Davis Wildlife Refuge.

### FOREST HILL ROAD AND RICHMOND HILL ROAD CONNECTIONS—TWO-LANE PARK ROAD (2036)

The two lane (40-foot-wide) park road under this option would not have any impacts with respect to:

- Geology soils and groundwater;
- Floodplains; or
- Terrestrial resources.

Under the two-lane park road option, there are changes in hydrology due to road runoff and changes in the DSNY stormwater management basins; however, the volume of runoff generated under this option would be less than under the four-lane option, given that there would be less impervious road surface area. In addition, given the reduced volume of stormwater, it is expected that under this option, stormwater management and water quality issues could be addressed without any adverse impacts. As with the four lane road, although a two lane road is narrower, there would be need for filling and possibly shading wetlands under this option and there is a need for a comprehensive mitigation plan. Total area of impacted wetlands and aquatic

habitats in this option are 2.16 acres (with 0.24 acres of shading) along the Forest Hill Road Connection and 2.49 acres of filling with the Richmond Hill Road Connection. However, the filling of wetlands would be less than under the four-lane road option, given that the park road width at 40 feet is less than the 60 feet with the four-lane road option. Finally, although the road is narrower under this option, it is expected that there would be similar impacts related to habitat fragmentation with the proposed two-lane road, since there would be new structures and increased vehicular traffic across habitats. Water quality protection and aquatic resources/wetlands protections would need to be implemented as part of the project design in order to avoid impacts of conflicts with any Significant Coastal Fish and Wildlife Habitats, particularly with respect to the Forest Hill Road Connection, which drains to Richmond Creek to the south and the northern segment of the Richmond Hill Road Connection, which drains to the north and feeds the Main Creek and the William T. Davis Wildlife Refuge.

#### *YUKON AVENUE CONNECTION—FOUR -LANE ROAD (2036)*

This four lane (60-foot-wide) road option would not have any impacts on:

- Geology soils and groundwater;
- Floodplains;
- Terrestrial resources;
- Threatened and endangered species; or
- Significant coastal fish and wildlife habitats.

As with the 2016 project phase summarized above, this four lane option would have only a minimal potential indirect impact on aquatic resources/wetlands as a result of road runoff and habitat fragmentation. A limited direct impact on wetlands and aquatic habitats (0.01 acres) could likely be avoided through a more detailed road design for the segment between Basins B1 and B2. In addition, like the 2016 phase summarized above, to avoid impacts to habitat fragmentation the culvert crossing beneath the road and connecting Basins B1 and B2 would be designed to replace the existing culvert with a culvert with oversized hydraulic dimensions and a natural bottom substrate thereby providing for a wildlife connection focused on amphibian and reptiles. In addition, to avoid impacts due to runoff, Best Management Practices would be proposed in the stormwater basins for the purposes of providing runoff management and wetlands enhancement. With these measures in place, it is expected that natural resources impacts under this 2016 project phase could be avoided or mitigated.

#### *EAST PARK LOOP ROAD WITH RICHMOND AVENUE CONNECTIONS (2036)*

##### *Wetlands and Aquatic Habitats*

###### *Freshwater Wetlands*

In this option, impacts to the freshwater wetlands occur at both the Richmond Hill Road and Forest Hill Road Connections. Under this option, about 1.92 acres of freshwater wetlands are impacted by the proposed connections. These impacts are based on preliminary designs and could potentially be minimized through more detailed road design. In addition, the proposed project includes a comprehensive wetland mitigation plan that could provide mitigation for these potential tidal wetland impacts.

###### *Tidal Wetlands*

In this option, impacts to the tidal wetlands occur primarily as a result of the East Park Loop Road option. These impacts include filling and grading impacts to the wetland-adjacent areas in

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multiple locations fronting along Main Creek and Richmond Creek. These impacts are based on preliminary designs and could potentially be minimized through more detailed road design. In addition, the proposed project includes a comprehensive wetland mitigation for these potential freshwater wetland impacts.

### *Floodplains*

This option may increase the amount of roadway within the 100-year floodplain, but it would not have a significant adverse impact on floodplains.

### *Water Quality*

This option includes provisions for collecting stormwater through drainage swales and use of existing sediment basins for treating the runoff through Low Impact Design and Best Management Practices. This option also proposes to collect stormwater from the perimeter roadways and direct it to the nearest water body or sediment basin. In order to avoid indirect water quality impacts to tidal wetlands or the water quality of Main or Richmond Creeks, a stormwater collection and treatment system utilizing Best Management Practices would need to be implemented for the western segments of the East Park Loop Road (those segments fronting along Main and Richmond Creeks), where there are no nearby sediment basins in which to direct runoff.

### *Hydrology*

Road pavement increases the imperviousness of a site, thereby increasing the quantity of runoff. Since a large portion of the park roads proposed in this option would be constructed in the same location as existing DSNY service roads, this option would have a smaller increase in total impervious area in East Park (and stormwater runoff quantities), compared with the Forest Hill Road/Richmond Hill Road connections discussed above.

### *Habitat Impacts*

Most of the segments of roads proposed under this option would be constructed in the same location as the existing landfill service roads, thereby limiting clearing impacts. While the new roads under this option would be wider than the existing service roads, disturbances would mostly be limited to previously disturbed areas. However, the location of these roads is adjacent to and encroaches on major wetlands on the north, west, and south edges of East Park, in particular the frontage along Main and Richmond Creeks in addition to the three Richmond Avenue Connections. In addition, the increased traffic that would be carried along these corridors, could cause indirect habitat impacts. Additionally, placement of traffic and road structures along water bodies and wetlands under this option could potentially impact aquatic habitat at the perimeter of the site. Thus, like the two-lane and four-lane road options, natural resources mitigation and impact avoidance measures would be necessary under this option, and would need to be developed as part of a more detailed park road design.

## **HAZARDOUS MATERIALS**

The FGEIS analysis (March 2009) concluded that nearly all of the project site has the potential to have been impacted by hazardous materials as defined under CEQR. Therefore, for site-specific capital project areas where off-mound soil and/or groundwater disturbance is proposed (e.g., excavation), significant adverse impacts could occur due to hazardous materials. The proposed project would be built in multiple phases over a number of decades. Therefore,

recommendations for individual project-specific subsurface investigation and, if necessary, remediation, are proposed to avoid this impact. With this individual project site investigation and testing program in place, any impacts due to hazardous materials would therefore be avoided during project implementation. In addition, in accordance with local, state, and federal laws, the demolition or reuse of any buildings would need to comply with environmental regulations relative to the handling and disposal of asbestos and lead paint.

## INFRASTRUCTURE

### INTRODUCTION

The East Park roads would not have a significant impact on water supply or wastewater treatment. Therefore, the focus of this SEIS is the potential for impacts on landfill infrastructure. A summary of this analysis is provided below.

### LANDFILL INFRASTRUCTURE IMPACT AVOIDANCE MEASURES

#### Introduction

DPR recognizes that the Fresh Kills Park project is a multi-year, multi-phase project with an obligation to avoid and minimize impacts to landfill infrastructure. Such an approach would protect the functionality of these systems, as well as minimize regulatory review and costs. DPR is committed to minimizing impacts of the project and to that end has developed an extensive assessment of conceptual impact avoidance and mitigation measures. These are presented below in detail as “Impact Avoidance Measures and Mitigation.” In addition, the following measures are presented as conceptual measures that can be taken to avoid impacts to landfill systems and thereby avoid conflicts with post-closure care and maintenance or impacts to public health and the environment. These measures are aimed at avoiding impacts as a result of the public access that would be created at East Park with the 2016 and 2036 road phases. Therefore, the measures presented below would not apply to the 2011 condition where only modified final cover design is implemented, but no additional public access is provided. In addition, the measures presented below would be subject to further refinement, design review by DSNY, and approval by DEC as part of more detailed designs of the proposed park roads.

#### Leachate Management System (2016 and 2036)

- Install locks at leachate collection well vaults, leachate collection well valve chambers, and associated electronic control panels. These measures are intended to protect the public against entry into confined spaces, where potentially unsafe atmospheric conditions may occur, and to protect the public from potential electrical hazards.
- Install security fences, locked gates (as necessary) and appropriate warning signs around leachate collection well vaults, valve chambers, and associated electronic control panels. These measures are intended to act as a deterrent against public interference with leachate management system features. The fencing and locks will be designed not to conflict with ongoing post-closure care maintenance and operation program procedures.
- Install locking manhole covers at manholes located along the leachate transmission forcemain route.
- Install perimeter security fencing around the Landfill Section 6/7 leachate transmission forcemain pump stations (for example). The design of fencing around these leachate

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management system features will require that it does not conflict with ongoing post-closure care maintenance and operation program procedures.

- Prevent malicious activities or vandalism to leachate management system infrastructure.
- Authorize park groundskeepers and security personnel to deter malicious acts or vandalism. This personnel would receive training regarding identification of landfill infrastructure and would be provided with emergency contact information for responsible landfill personnel.

### *Landfill Gas Management (2016 and 2036)*

- Develop project designs with DSNY and DPR coordination to avoid conflicts with the landfill gas management system features. Measures include selection of road alignments that avoid flare locations, or use of living fences (i.e., thorn bushes), or landscaping that would discourage activity on or along the landfill gas interceptor venting trench. The design would take into consideration any added post-closure care maintenance and monitoring activities that occur at the various landfill gas management system features.
- Install permeable gas venting layers (i.e., gravel layers) across interceptor venting trenches where park development features would cover the interceptor venting trenches.
- Post signage to inform the public regarding hazards associated with landfill gas.
- Maintain seals on landfill gas vents to prevent escape of landfill gas into the atmosphere. Unsealing of the gas vents would not be allowed without modification to the existing Title V and Part 360 landfill gas permits, which would involve review and approval by DEC.
- Install security fencing and locking gates around landfill gas flare pads.
- Install locking manhole covers on manholes associated with the landfill gas transmission main.
- Deploy DPR staff and security personnel with the authority to deter malicious acts of vandalism of landfill gas management system features. The personnel would receive training to identify landfill infrastructure and would be provided with emergency contact information for responsible landfill personnel.

### *Stormwater Management Systems (2016 and 2036)*

Park road elements would alter runoff patterns and increase impervious surface cover. Like the current and future land cover at Fresh Kills, the vegetative cover that is proposed with the project would both control erosion and allow for substantial evapotranspiration. The greatest change in the proposed hydrology at the site would be the introduction of impervious surfaces with the proposed park roads.

To avoid stormwater impacts from increases in impervious surfaces and to protect receiving waters, individual stormwater Best Management Practices (BMPs) would be used to enhance proposed park features and provide water quality treatment and quantity management, particularly for the road runoff. The general objectives of the proposed stormwater management system are to:

- Continue to collect and handle all on-site runoff without off-site or downstream impacts.
- Maximize pervious surfaces and minimize the introduction of new impervious surfaces, reusing existing structured surfaces where feasible;
- Provide natural systems for stormwater management to the extent possible, but consistent with landfill design regulations (e.g., created runoff swales, pocket wetlands, vegetated

- treatment swales, planter boxes) and minimize the use of hard infrastructure (e.g., inlets and pipes), particularly for handling runoff from roads and parking areas;
- Minimize impacts to natural stormwater management features at the site, such as freshwater and tidal wetlands to minimize any potential impacts to local water quality; and
  - Utilize the existing DSNY stormwater basins, to the extent feasible, without adversely impacting the DSNY stormwater management system.

The stormwater management projects proposed as part of the park would be designed to complement and enhance the aesthetic and ecological aspects of the proposed park, meet the above-described stormwater management objectives, and improve upon the current hydrologic and water quality management provided by the existing stormwater infrastructure. To achieve these goals, the approach would utilize a mix of traditional conveyance and storage measures (including the existing downchutes and large-scale detention basins) and smaller controls selectively located throughout each sub drainage area. By utilizing stormwater controls, runoff flows would also be routed through multiple levels of treatment prior to discharge off the site, thereby protecting local water quality. In addition, any modification or reuse of stormwater basins for park-generated stormwater runoff would be subject to the reviews of DSNY and the approval of DEC. Measures related to protecting stormwater management systems include the following:

- Develop landscape features to discourage park users from entering drainage channels.
- Post signage that informs park users that the stormwater management basins are not publicly accessible and that entry into stormwater culverts is prohibited.
- Provide DPR personnel with the authority to deter malicious acts or vandalism of final cover and stormwater management features.

#### PROPOSED ROAD EMBANKMENT (2011)

##### *Landfill Infrastructure*

The proposed modification to final cover design is consistent with Part 360 design requirements and meets all performance standards associated with final closure. Construction modifies the landfill final closure grades along the proposed road corridor. Thus, the 2011 construction would create two 60-foot-wide corridors across Landfill Section 6/7 that provide sufficient separation between the bed of the proposed roads (for the Yukon Avenue and Forest Hill Road Connections), such that no further relocation of the landfill infrastructure would be necessary to accommodate construction of the 2016 or 2036 project roads.

To accommodate this grading, and to ensure that there would be no impacts to landfill infrastructure, measures, (summarized below), would preserve the integrity of the final cover grading, the landfill gas system, stormwater management and landfill services roads, recognizing that this proposed cover design does require relocation of some landfill gas extraction wells and headers, and relocation of stormwater channels and culverts. A summary discussion follows.

##### *Landfill Gas Infrastructure Modifications*

Three general sections of the landfill gas extraction system are required to be relocated or modified to accommodate the modified closure plan. These areas include: (i) the east side Yukon Avenue corridor; (ii) the west side of the Yukon Avenue corridor; and (iii) the central portion of the Forest Hill corridor.

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### *Post-Closure Care—Service Road Modifications*

The Final Closure Report includes the establishment of multiple gravel service roads across the landfill surface that connect to the existing paved service road that currently encircles landfill Section 6/7.

The Landfill Section 6/7 Final Cover Design Report, Addendum 1 would encroach upon the proposed access roads located at the east end of the corridor. To mitigate this encroachment, the service road would need to be relocated to the north and outside of the Yukon Avenue corridor. Prior to the 2016 project road construction, the Yukon corridor is expected to be a new and usable gravel access road for DSNY use.

The Forest Hill Road corridor bisects the proposed service road that is to provide access to the southernmost tip of the Landfill Section 6/7. To mitigate this encroachment the Landfill Section 6/7 Final Cover Design Report, Addendum 1 includes a new DSNY access road to this location. The Forest Hill Road corridor also bisects a landfill service road that enters the landfill from the south-central area of the site. The bisection of the service road by the Forest Hill Road corridor would not alienate any portion of the landfill or landfill infrastructure; therefore, no mitigation is required for this encroachment. Prior to the actual road construction, the Forest Hill Road corridor would, in fact, provide a new and usable gravel access road for DSNY use.

### *Grading*

Grading under the Landfill Section 6/7 Final Cover Design Report, Addendum 1 comprises two separate surfaces: an embankment plan, which is the grade where the geomembrane barrier (i.e., bottom of the cap section) is established; and a final grade plan, which is the finished surface elevation. The embankment plan incorporates a minimum 4 percent grade and maximum 33 percent grade as required by New York Part 360 landfill regulation design criteria. In the areas of the Yukon Avenue and Forest Hill Road corridor that are coincident with the future analysis year project roadway alignments, the cover system would consist of the following components from bottom to top. The proposed modifications to the final cover include:

- 40 mil thick LDPE Geomembrane hydraulic barrier;
- 300-mil thick double sided drainage net layer;
- 48-inch thick layer of barrier protection soil (i.e., sand);
- Woven geotextile separator layer; and
- 6-inch thick layer of crushed stone (driving surface).

The 48-inch-thick layer of barrier protection material is two-times the thickness of barrier protection material as required by the current (and approved) Landfill Section 6/7 Final Cover Design Report. The increased thickness would ensure that the minimum, NYSDOT-recommended separation distance of 4 feet between pavement structures and waste is maintained.

In other areas outside of the road embankments that require grading, the proposed cover design would conform to the currently approved Landfill Section 6/7 Final Cover Design Report.

### *Stormwater System*

Minor modifications to the approved final cover stormwater management system would be necessary under this Landfill Section 6/7 Final Cover Design Report, Addendum 1. These include modified cover types, drainage pipe outlets, channel modifications, relocation of swales, construction of new swales and culverts, and conveyance to the existing stormwater drainage

basins. Details of these modifications are provided in the Landfill Section 6/7 Final Cover Design Report, Addendum 1 (Geosyntec for DSNY, September 2009). That report also includes an analysis and discussion of the hydrologic conditions under this cover plan with the proposed embankments.

The proposed stormwater management plan for the Fresh Kills Landfill Section 6/7 cover maintains the primary functions of the existing stormwater drainage system which include: minimizing infiltration into the final cover; collecting all landfill-generated stormwater runoff; and removing pollutants and sediment prior to discharge into adjacent waterways. As part of the proposed design, the Forest Hill Road Connection and Yukon Avenue Connection embankments would direct several of the existing drainage areas to existing stormwater control basins. After completion (2011), it is assumed that the Forest Hill Road and Yukon Avenue Connections would be landfill service roads (about 15 feet wide) built on suitable fill material.

No modifications to the existing stormwater control basins are necessary to accommodate the 2011 modified closure plan. The existing basins would therefore continue to manage the quantity and quality of stormwater discharged into existing adjacent waterways.

#### *Firewater and Overhead Electric Lines*

There are water supply/revised grading conflicts with the existing 8-inch diameter firewater main and overhead electric supply that service the site. To mitigate the firewater main conflict, a portion of the existing firewater main would be relocated to a lower elevation below the modified final cover membrane elevation. To mitigate the overhead electric supply conflict, the electric line would be relocated to the north and east.

#### *YUKON AVENUE CONNECTION (2016)*

##### *Landfill Infrastructure*

As described above, the modifications to landfill infrastructure and cover to accommodate the proposed Yukon Avenue Connection across Landfill Section 6/7 would be addressed under the proposed cover plan. Thus, no further modification is needed to install the proposed roads for the road segment across the landfill, which would be developed atop the previously prepared embankment.

For the segment of road between the base of the landfill and Richmond Avenue, work would encroach upon the existing service road that provides access to environmental monitoring points located to the north of the alignment. However, no monitoring points are located within the proposed alignment; therefore, no further modifications to the landfill infrastructure would be required.

In the area of the leachate management system slurry cutoff wall, a reinforced concrete slab would need to be installed to distribute the traffic loads and prevent excessive deformation of the top of the cutoff wall. It is expected that the proposed project could be constructed without any impacts to the slurry wall. The final design of the cutoff wall protective system would be prepared as part of a subsequent submittal associated with the park road design and construction. That submittal would be subject to DSNY and DEC approval.

##### *Stormwater Management*

As part of the road construction, the existing sediment basins (B1, B2) that receive runoff from the proposed Yukon Avenue Connection would be modified to perform a water quality

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improvement function. According to the *New York State Stormwater Management Design Manual* (Design Manual), dated April 2008, the existing storm water sediment basins would need to meet the DEC design criteria, handle the proposed road runoff, and provide the adequate water quality treatment. Given the current size of the basins and the potential for water quality treatment features as part of the park road design, it is expected that the basins have sufficient storage capacity such that they could be modified to handle and treat the added runoff from the future park roads. Thus, with the proposed designs no adverse impacts are expected with respect to the functions of the stormwater basins as components of the landfill infrastructure nor are significant adverse impacts expected on local water quality.

Final design of the stormwater management system would be prepared as part of a subsequent submittal associated with the park road design. That submittal would be subject to DSNY review and DEC approval.

### *Post Closure Care/Service Roads*

The proposed project would include the necessary turn lanes and gated access points from public roads onto landfill service roads. The gates and turn lanes would allow DSNY personnel access to the site to perform post-closure care, maintenance, and monitoring.

The landfill service roads provide access to various components of the landfill environmental protection systems, which are located throughout Fresh Kills Landfill. Although each of the individual landfill environmental protection systems may only be accessed on a regularly scheduled periodic interval, the combination of all the activities associated with multiple systems results in a requirement for nearly continuous access throughout the site. Consequently, it is essential to establish dedicated landfill service roads that are separate from the Fresh Kills Park East Park roads system, specifically the public vehicular roads. It is recognized, however, that multi-use paths within the park circulation system are compatible with landfill service roads. For instance, service vehicles would travel at low speeds on shared paths, partial blockage of multi-use paths for landfill operational requirements could be done while still accommodating foot or bicycle traffic.

It is expected that DSNY would be the City agency responsible for compliance with the post-closure care monitoring and maintenance until such time as compliance may be transferred to DPR or another entity with the approval of DEC.

### *EAST PARK ROAD SYSTEM (2036)*

#### Overview

As stated above, the long term build out for the East Park road system includes a number of options. Impacts of these long term options are summarized below. It is recognized that all the measures presented below, with respect to avoiding impacts to leachate collection and landfill gas collection systems, stormwater management basins, landfill service roads, and post-closure care monitoring and maintenance, would be subject to future, more detailed park road designs with a review by DSNY and approval by DEC. Thus, the analysis below is presented as a preliminary assessment.

#### *Forest Hill and Richmond Hill Road Connections—Four-Lane Road Option (2036)*

##### *Forest Hill Road*

*Landfill Infrastructure.* As described above, the modifications to landfill infrastructure in order to accommodate the proposed Forest Hill Road Connection across Landfill Section 6/7 are

addressed under the Landfill Section 6/7 Final Cover Design Report, Addendum 1. Thus, no further modification of the landfill cover is needed to install the proposed park public vehicular roads on top of the previously prepared embankment. In addition, no additional measures would be necessary relative to the fire and electrical service modifications discussed above for 2011.

For the segment of the Forest Hill Road between the base of the landfill and Richmond Avenue (the off-landfill segment) the proposed alignment would encroach upon the landfill gas vent trench as well as landfill gas monitoring point GX-40. To mitigate these encroachments, a gravel venting layer would be placed above the landfill gas vent trench to ensure a permeable conduit to the surface. Placement of fill soil or pavement over a limited section of the gas vent trench is consistent with as-built conditions along the vent trench. Therefore, the fill placement, along with the permeable layer would not compromise the vent trench's ability to function. In addition, site-specific design measures could be taken to avoid the landfill monitoring gas well, which is near but not within the proposed alignment.

*Stormwater.* As part of the road construction, the existing sediment basins (R, C1, and C2) which receive runoff from the Forest Hill Road alignment would need to be modified to perform a stormwater runoff treatment function in the same manner as described for the 2016 condition.

*Richmond Hill Road Connection*

*Landfill Infrastructure.* As it negotiates the narrow passage between the DSNY District 2 Garage and the landfill, the proposed Richmond Hill Road Connection would potentially impact the outlet stream from Basin A.

In addition, the proposed embankments across Basin B1 would divide the basin. Preliminary analyses indicate that the remaining landfill stormwater basin would be sufficient to meet its functional purpose. Culverts will be added, with sufficient dimensions, to maintain hydraulic continuity and balance water levels.

For the segment of the Richmond Hill Road Connection between the base of the landfill and Richmond Avenue the alignment would pass near groundwater monitoring wells 154D, 174S, and 153D. The alignment would also pass gas migration monitoring wells G-44, G-17, G-18, G-46, and G-19. Each of these systems would need to be protected during construction, but not relocated.

*Stormwater.* As stated above, the details of the proposed stormwater management system would be developed as each park capital project and segment of road design is further developed. However, runoff from the proposed park roads is expected to be controlled on-site using the existing stormwater management basins and would not adversely impact surrounding neighborhoods, open spaces or water quality. In addition, to avoid stormwater impacts from increases in impervious surfaces, individual stormwater BMPs would be used to enhance proposed park features, and provide water quality treatment, particularly for the road elements.

As part of the road construction, the existing sediment basins (R, C1, and C2) which receive runoff from the Forest Hill Road alignment would need to be modified to perform a water quality treatment functions in the same manner as described for the 2016 basin modifications. With the proposed designs no adverse impacts are expected with respect to the functions of the stormwater basins as components of the landfill infrastructure nor are significant adverse impacts expected on local water quality. Future stormwater management designs for the park roads are also subject to DSNY review and DEC approval.

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### *Forest Hill and Richmond Hill Road Connections—Two-Lane Road Option (2036)*

Like the four-lane road option, the two-lane park road option would be a road constructed over the modified Section Landfill 6/7 final cover and the road segments east of Landfill Section 6/7. Therefore, the proposed two-lane-road must also account for these landfill infrastructure conditions and potential conflicts in the same manner as the four-lane option.

Because of the narrower road width in the two-lane park road option, it is expected to apply a smaller load to the landfill than the four-lane option. Like the four-lane option, this alignment passes over eight lateral landfill gas collection pipes and one landfill gas extraction well and crosses the southern landfill gas collection header ring (at two locations). It will utilize protective steel casings or plates to protect gas pipes and would require the relocation of three rather than four gas wells along Forest Hill Road Connection on Landfill Section 6/7.

As with the four-lane option, swales and ditches would be introduced to intercept runoff that would otherwise flow onto the road. Swales would be placed along much of the north edge of the road to intercept mound runoff on the uphill side. A culvert would also be added under the roadway on the west side to convey flows westward toward Basin C2. The length of this culvert under this option is less than that required for the four-lane option.

Likewise, with the appropriate construction-period protection measures, there would not be any impacts on the production of leachate nor would there be hazards for landfill slope stability. With both the proposed four-lane and two-lane park roads, there would be changes in hydrology due to road runoff and changes in the DSNY stormwater management basins; however, the volume of runoff generated under this option would be less than under the four-lane option given that there would be less impervious surface area. In addition, given the reduced volume of stormwater, it is expected that under this option, like the four-lane proposal, stormwater management issues could be addressed without any adverse impacts. There are no significant differences between the two-lane and four-lane options in terms of impacts or conflicts with the environmental monitoring system.

Additional details with respect to landfill infrastructure impacts are presented below by road segment.

#### *Forest Hill Road Connection*

##### *Landfill Infrastructure*

As described above, the modifications to landfill infrastructure to accommodate the proposed Forest Hill Road Connection across Landfill Section 6/7 would already be addressed as part of the Landfill Section 6/7 Final Cover Design Report, Addendum 1. Thus, no further modification is needed for the 2036 condition where the proposed road segment across the landfill would be developed on top of the previously prepared embankment. In addition, no additional measures would be necessary relative to the fire and electrical service modifications for 2011 (discussed above).

Impacts on landfill infrastructure would be somewhat less with this option since the road itself would be narrower. This would result in less road coverage and also opens the option to allowing minor changes in road alignment that can further avoid or reduce any impacts on landfill infrastructure.

As described above for the four-lane road option, for the segment of the Forest Hill Road Connection between the base of the landfill and Richmond Avenue the alignment would encroach upon a landfill gas vent trench. Landfill gas migration monitoring point GX-40 is

located in the vicinity of the alignment. Therefore, to avoid impacts GX-40 would be flagged and protected from disturbance during construction. To mitigate these encroachments, a gravel venting layer would also be placed above the landfill gas vent trench to ensure a permeable conduit to the surface. Placement of fill soil or pavement over a limited section of the gas vent trench is consistent with as-built conditions along the vent trench. Therefore, the fill placement, along with the permeable layer would not compromise the vent trench's function.

Both the four- and two-lane road options cross the leachate management system; however, the four-lane option would affect a wider length of cutoff wall and leachate collection trench. The two-lane park road option would require less extensive protective measures due to its narrower footprint. Impacts on the landfill gas management system are on the whole relatively minor, but are slightly smaller for the two-lane option.

#### *Stormwater*

As part of the park road construction, the existing stormwater management basins (R, C1, and C2) which receive runoff from the Forest Hill Road alignment would be modified to perform a water quality treatment function in the same manner as described above for the 2016 condition. With the proposed designs no adverse impacts are expected with respect to the functions of the stormwater basins as components of the landfill infrastructure nor are significant adverse impacts expected on local water quality. Future stormwater management designs for the park roads are also subject to DSNY review and DEC approval.

#### *Richmond Hill Road Connection*

##### *Landfill Infrastructure*

As it negotiates the narrow passage between the DSNY District 2 Garage and the landfill, the proposed park segment of the Richmond Hill Road Connection would impact the outlet stream from Basin A to the detention area to the south. This impact would require that a closed drainage system adjacent to Basin A be extended to a location south of the existing DSNY garage. The proposed road would also overlap the landfill cut-off wall at two separate points, for which protective slabs are proposed to shield the cut-off wall from the effects of roadway loads.

This crossing requires a culvert to maintain hydraulic function between the basins. Similarly, culverts would be proposed beneath the roadway to maintain the hydraulic connection at the north end of Basin B1. In between, the alignment takes up the space of an existing gravel access road leading to groundwater and landfill gas monitoring wells. Protected pullouts would be provided at each monitoring well. The landfill gas interceptor venting system would also be affected along this segment of roadway.

For the segment of the Richmond Hill Road Connection between the base of the landfill and Richmond Avenue, as with the four-lane-road option, the two-lane-road option would pass near groundwater monitoring wells 154D, 174S, and 153D. The alignment would also pass near gas migration monitoring wells G-44, G-17, G-18, G-46, and G-19. Each of these features would be protected during construction, but not disturbed.

In addition, the proposed embankments across Basin B1 would divide the basin. However, preliminary hydrology analyses indicate that there would be sufficient storage capacity remaining in the landfill stormwater basin to meet its functional purpose. Culverts would also be added to maintain hydraulic continuity and balance water levels.

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### *Stormwater*

As part of the roads construction, the existing sediment basins (R, C1, and C2) which receive runoff from the Forest Hill Road alignment would be modified to perform a water quality treatment function in the same manner as described for the 2016 basin modifications. With the proposed designs no adverse impacts are expected with respect to the functions of the stormwater basins as components of the landfill infrastructure nor are significant adverse impacts expected on local water quality.

As described above, the details of the proposed stormwater management system would be developed as each park capital project and segment of road design is further developed. These future stormwater management designs for the park roads would be subject to DSNY review and DEC approval. To avoid stormwater impacts from increases in impervious surface to the receiving waters, these designs would incorporate individual stormwater BMPs to enhance existing wetlands and stormwater basins and to provide water quality treatment and runoff control. With these measures in place, the proposed project could manage all increases in site-generated runoff while contributing positively to the local wetlands.

### *YUKON AVENUE CONNECTION —FOUR-LANE ROAD (2036)*

As with the two-lane proposal described above (2016), the Yukon Avenue Connection under the four-lane option passes over the landfill. In both the four-lane option and the two-lane option, the Landfill Section 6/7 Final Cover Design Report, Addendum 1 would account for the road embankment conditions for a 60-foot-wide road. Among the affected elements along the Yukon saddle alignment are two landfill gas collection laterals, crossing of landfill gas collection headers, covering of a leachate stone trench and a water line. Culverts would also be introduced to maintain drainage conveyance patterns.

In both the four-lane and the two-lane park road options, the Yukon Avenue Connection traverses the filled land and DSNY road situated between Basins B1 and B2.

As described above, the details of the proposed stormwater management system would be developed as each park capital project and segment of road design is further developed. These future stormwater management designs for the park roads would be subject to DSNY review and DEC approval. To avoid stormwater impacts from increases in impervious surface to the receiving waters, these designs would incorporate individual stormwater BMPs to enhance existing wetlands and stormwater basins and to provide water quality treatment and runoff control. However, with these measures in place, it is expected that this proposed road option could handle all increases in site-generated runoff while not adversely impacting landfill stormwater management systems without impact to local water quality.

### *EAST PARK LOOP PARK ROAD WITH CONNECTIONS TO RICHMOND AVENUE (2036)*

#### *Introduction*

Under this option, with the appropriate construction period protection measures, there would be no impacts on the production of leachate, nor would there be hazards for landfill slope stability. However, it is recognized that with this option there may be need to modify landfill infrastructure at the base of Landfill Section 6/7, including the leachate collection and pumping systems. With this option there are changes in hydrology due to road runoff and changes in the DSNY stormwater management basins; however, unlike the above options, it is expected that the Loop East Park Loop Road option would be expected to use the DSNY basins, as well as the

Main Creek and Richmond Creek wetlands for runoff control given the alignment around the entire base of the landfill. Unlike the above options, this option would avoid the filling and associated hydrology impacts on Basins B1 and A as occurs with the Richmond Hill Road segment described above.

Where the above-described options and this option differ is primarily in the areas of road design and engineering, conflicts with landfill systems, natural resources, and park design. These differences are summarized below.

#### *Pump Stations and Landfill Cover*

As part of the leachate conveyance system, there are 14 existing pump stations located on the outboard side of the existing service road (around Landfill Section 6/7), 13 of which are located in the proximity of this alignment. Due to the lack of adequate space for the proposed roadway section, this roadway alignment alternative does not allow for a shoulder in the proximity of the existing pump stations. The following are potential impacts the roadway proposals may have on the pump stations:

- Roofs of pump stations located adjacent to the traveled-way could carry loading in excess of H-20 from an errant vehicle.
- Maintenance procedures would have to be altered in order for maintenance workers to safely perform their duties at any station located within the traveled-way.
- Gas vents and electrical cabinets could be struck by an errant vehicle, endangering operation of the pump station.

Final closure of the northern portion of Landfill Section 6/7 (approximately defined as those areas to the north of Yukon Avenue) is complete. As a result, impact avoidance on the road segments under this option could require excavation and backfilling a portion of the installed final cover. These activities could threaten the integrity of the landfill liner, and therefore are not recommended in the northern segment of the road design. These impacts and the need for avoidance or mitigation would be subject to further design review and approval by DSNY and approval by DEC as part of the park road design.

#### *Gas Management System*

##### *Active Landfill Gas Collection System*

Extraction wells and gas header pipes are unaffected by this option, as they are all located in the interior of the mound and outside of the roadway grading limits.

However, eight condensate tanks for the north portion of the East Park Loop Road would be impacted by this option because they are currently located underneath the existing and proposed roadway. At these locations, equipment, loading, and excavation constraints would be implemented to avoid any damage to the existing gas collection system. In addition, six drip leg vaults would lie within the proposed roadway.

##### *Passive Landfill Gas Venting System*

In Landfill Section 6/7, a geocomposite gas venting layer with passive vents along the landfill section perimeter is proposed for the southern portion of Landfill Section 6/7. Several of the passive gas vents in this area fall within the southern portion of the landfill section and within the grading limits of this alternative alignment.

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On the northern section of Landfill Section 6/7, several gas vents fall within the roadway grading limits. In this case, minor realignment along with other design solutions would need to be addressed to avoid these impacts.

### *Grading and Stormwater Management*

The landfill stormwater management system consists of a series of swales, gabion downchutes, culverts, inlet pipes and control basins. The design intent of this option is to direct the runoff from the last tier/terrace of Landfill Section 6/7 across the roadway pavement by providing a two percent roadway cross-slope away from the landfill section. This design conflicts with standard design practice and has the potential to contribute to hydroplaning and icing conditions on a public road, because this option would continue to allow some of the surface runoff from the landfill to flow across the road surface. However, there are techniques to avoid this impact. Since the drainage area contributing to runoff that crosses the roadway varies across the site, it is recommended that further studies be performed during the more detailed design stage to avoid this impact.

Final cover in the southern portion of Landfill Section 6/7 (i.e., areas south of Yukon Avenue) has not yet been completed. This may allow for the modification of stormwater management plans to accommodate this option that would reduce the quantity of stormwater runoff flowing across the proposed road.

Future stormwater management designs for the park roads are also subject to DSNY review and DEC approval.

### *DSNY Maintenance*

It is important to note that under this option, maintenance of the Fresh Kills leachate pumping system would require periodic closure of a travel lane on the East Park Loop Road. The leachate pumps are all located along the outer lane of the East Park Loop Road. This would require periodic closure from two lanes to one. There are no leachate pumps located along the link between the Main Creek and Richmond Creek Bridges. There are also no pumps along the extension of Yukon Avenue Connection.

## **TRAFFIC AND PARKING**

### *PROPOSED ROAD CONNECTIONS AND TRAFFIC DIVERSIONS*

The proposed park would create a pattern of park roads, improvements to the northbound and southbound service roads of the West Shore Expressway, and new ramp connections to the main line of the West Shore Expressway, that, in addition to providing park access, would provide a direct connection between Richmond Avenue on the east and the West Shore Expressway (northbound and southbound lanes) on the west. Since there is currently no such direct connection, the new park roads would result not only in park-destined traffic, but traffic diversions on the new access roads to the West Shore Expressway. It is expected that with the new park roads, traffic traveling north- and southbound along Richmond Avenue would use these roads to access the West Shore Expressway. The reverse travel pattern is also assumed. This diverted traffic would be in addition to the park-destined traffic.

It is recognized that the focus of this part of the analysis is the intersections in the area that could potentially be adversely impacted by the redistribution of traffic with the proposed park roads. This analysis did not examine the intersections in the area that could potentially benefit from the

proposed park roads. These benefits are summarized above under “Project Description: Purpose and Need.”

*PROPOSED ROAD EMBANKMENT (2011)*

This analysis condition does not generate any new traffic pattern or diversions.

*YUKON AVENUE CONNECTION (2016)*

*Road Description and Study Area*

As discussed above, the Yukon Avenue Connection calls for a two-lane, two-way public road that would cross Landfill Section 6/7 with a connection to Yukon Avenue. The new intersection of Yukon Avenue at Richmond Avenue created as part of the proposed connection would therefore capture all of the diverted traffic across Fresh Kills Park in 2016 as well as a certain number of park-destined trips. Since the use of the proposed East Park road would not affect traffic patterns at other intersections already analyzed in the FGEIS, the traffic impact analysis was limited to the five intersections east of East Park.

*Traffic Diversions*

As discussed above, the Yukon Avenue Connection assumes one park connection to Richmond Avenue for vehicular traffic at the intersection of Yukon Avenue and Richmond Avenue. To generate traffic volumes for the 2016 project condition, traffic diversion patterns developed for the *Fresh Kills Park FGEIS* were modified to account for the single connection at this location in 2016.

*Park Trip Generation and Assignments*

The 2016 park development program as presented in the FGEIS is unchanged for this SEIS. Therefore, the total number of project-generated vehicular trips for the 2016 analysis year is unchanged. Park trip assignments along Richmond Avenue are then all channeled to the Yukon Avenue/Richmond Avenue intersection.

*Traffic Impacts*

In 2016 with the Yukon Avenue Connection in place, four (4) out of the five (5) analyzed intersections would experience significant adverse traffic impacts with the proposed project.

Overall, traffic conditions at the Yukon Avenue/Richmond Avenue park entrance would be congested and/or impacted during all five analyzed peak hours in 2016; traffic operating conditions at the intersection of Forest Hill Road and Richmond Avenue would be similar to the No Build conditions; the Richmond Hill Road and Forest Hill Road intersection would have impacts in a number of approaches for all analyzed peak hours. At the Yukon and Richmond Avenue intersection, the newly proposed northbound left-turn movement would operate under congested (mid-LOS D or worse) conditions during all five analyzed peak hours; the proposed eastbound left-turn movement would operate under congested conditions during all peak hours except for the weekday AM peak hour. The southbound shared through and right-turn movement would be impacted during the weekday PM peak hour. Richmond Hill Road and Richmond Avenue intersection would also have impacts in all five analyzed peak hours.

Mitigation for these potential impacts is summarized below under “Impact Avoidance Measures and Mitigation.”

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### *COMPLETED EAST PARK ROAD SYSTEM (2036)*

#### *Park Road Description and Study Area*

By 2036, the project could have two additional road connections to Richmond Avenue components, one at Forest Hill Road and the other at Richmond Hill Road. Under one option there is only one connection, at Yukon Avenue. Under the Yukon Avenue only option, the intersection design is similar to 2016, but the road is widened to four lanes. As with the 2016 condition, since the use of East Park roads would not affect traffic patterns at other intersections already analyzed in the FGEIS, the traffic impact analysis was limited to the five intersections east of East Park.

#### *Traffic Diversions*

With up to three connections at Richmond Avenue, traffic diversion patterns developed for the FGEIS 2036 analysis year were modified to account for the additional connection at the Yukon Avenue/Richmond Avenue intersection.

#### *Park Trip Generation and Assignments*

For the 2036 analysis year the park trip generation is the same as analyzed in the FGEIS. However, with the additional connection at the intersection of Yukon Avenue and Richmond Avenue, the assignments are different in that both the in-and outbound project generated vehicular trip assignments were modified. Specifically, the proposed project inbound vehicular trip assignments along Richmond Avenue were modified by assigning approximately 17, 16, and 26 percent of project-generated (park-and diversion-related) vehicular trips to the intersections of Richmond Hill Road, Yukon Avenue and Forest Hill Road at Richmond Avenue, respectively. For the 2036 option with just the Yukon Avenue Connection, all park-destined Richmond Avenue traffic would use this connection.

#### *Traffic Impacts*

##### *Forest Hill Road and Richmond Hill Road Connections*

Based on the above, the park road options that have three connections along Richmond Avenue would have the following impacts. For 2036 future traffic conditions, all five (5) analyzed intersections would be impacted. At the intersection of Yukon Avenue and Richmond Avenue, the westbound approach would be impacted during the weekend midday peak hour. The proposed northbound left-turn movement would operate under congested conditions during all peak hours under this alternative. Also, the southbound shared through and right-turn movement would be impacted during the weekday PM and weekend midday peak hours. At the intersection of Forest Hill Road and Richmond Avenue, the southbound shared through and right-turn movement would also be impacted. At the intersection of Yukon Avenue and Forest Hill Road, the northbound approach would also be impacted.

Mitigation for these potential impacts is presented in summarized below under “Impact Avoidance Measures and Mitigation.”

##### *Yukon Avenue Connection*

With this option, neither the Richmond Hill Road nor Forest Hill Road connections to Richmond Avenue are provided. Thus, the only 2036 connection to Richmond Avenue for vehicular access to the through-connection to the West Shore Expressway is via the Yukon Avenue Connection.

Under this option, the intersection of Richmond Hill Road at Forest Hill Road would be impacted during all analyzed peak hours. For the intersection of Richmond Hill Road at Richmond Avenue, four out of the five peak hours would be impacted. For the intersection of Forest Hill Road at Richmond Avenue, one peak hour is impacted. The newly created intersection of Yukon Avenue at Richmond Avenue under this option would also be impacted.

Mitigation for these potential impacts is presented in summarized below under “Impact Avoidance Measures and Mitigation.”

#### *Parking*

Under all the Build options, as described in the *Fresh Kills Park FGEIS*, there would be no changes with respect to future parking conditions. Thus, neither this alternative nor the proposed project would have a parking impact.

### **TRANSIT AND PEDESTRIANS**

Currently, the proposed Fresh Kills Park site is not directly served by Metropolitan Transportation Authority/New York City Transit (MTA/NYCT) existing bus routes; however, there are several existing bus routes that serve its periphery, with weekday regional service provided via the West Shore Expressway and local park and rides. In the future with the proposed park, and the proposed East Park roads, it is expected that MTA/NYCT could either expand bus service and routes to accommodate the park-generated transit demand (especially during the weekend summer months) or would amend the existing bus routes to include new stops within the park and along its exterior boundaries. It is anticipated by park planners that expanding the availability of bus transit in the future conditions could potentially reduce the number of project-generated auto trips by shifting the patrons to mass transit. This could, over time, reduce vehicle trips and improve transit use at the local (boroughwide), citywide, and regional levels. Reduced traffic would also reduce demands on parking and enhance the overall park experience while potentially increasing park use through transit arrivals. Therefore, DPR would continue to coordinate with MTA/NYCT for the purposes of providing transit service to the park.

### **AIR QUALITY**

#### *MOBILE SOURCES ANALYSIS*

##### *Proposed Road Embankment (2011)*

Since no changes in vehicular travel would occur under the 2011 modified closure, it is assumed that no significant changes in background air quality would occur through that analysis year. The proposed project would not result in any odor impacts to future park users as a result of the modified closure program. It is also not expected that the Landfill Section 6/7 Final Cover Design Report, Addendum 1 would not result in any significant adverse impacts with respect to landfill gas emissions.

##### *Yukon Avenue Connection (2016)*

With the proposed Yukon Avenue Connection, carbon monoxide (CO) concentrations would not result in any violations of the 8-hour CO standard. In addition, the incremental increases in 8-hour average CO concentrations would be very small and, consequently, would not result in a violation

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of the CEQR *de minimis* CO criteria. Therefore, the proposed project would not result in any significant adverse CO air quality impacts.

### East Park Road System (2036)

In 2036, CO concentrations with the proposed project would not result in any violations of the 8-hour CO standard. In addition, the incremental increases in 8-hour average CO concentrations would be very small and, consequently, would not result in a violation of the CEQR *de minimis* CO criteria. Therefore, the proposed project would not result in any significant adverse CO air quality impacts.

### *MESOSCALE ANALYSIS*

The proposed project would create new connections to the West Shore Expressway, including the extension of service roads. The results of the analysis of vehicle miles traveled indicated a slight increase in emissions (less than 5 percent) for each of the analyzed pollutants as compared to the No Build condition. According to the NYSDOT *EPM*, projects with a VMT difference of 10 percent or more are considered to have a potential significant impact on regional emissions. These results are below the 10 percent threshold. In addition, the mesoscale analysis is conservative since it does not take into account vehicle emissions due to idling and the proposed new connections to the West Shore Expressway are expected to reduce local traffic congestion which will, in turn, reduce idling. Nevertheless, the slight increase in emissions from the proposed project is not considered to be regionally significant.

### **NOISE**

#### PROPOSED ROAD EMBANKMENT (2011)

There would be no added traffic or operational noise impacts from the proposed road embankment (the road would not be operational for public traffic).

#### YUKON AVENUE CONNECTION (2016 AND 2036)

Future noise levels with the proposed action were calculated for the 2016 analysis year under for the full Fresh Kills Park program including all park and traffic elements.

Based on that analysis, the increase in  $L_{eq(1)}$  noise levels would be less than 1.0 dBA at receptor sites from 1 through 13. At receptor sites 3, 7, 9, 10, 11, and 12, a decrease in noise levels was predicted to occur for analysis conditions due to the decrease of 2016 traffic volume at Arthur Kill Road, Richmond Hill Road, Victory Boulevard, and Travis Avenue. The traffic under the proposed project would be expected to decrease at these locations due to the reverse travel pattern caused by the new park roads. At those locations where the proposed project would result in an increase in noise levels, the changes would not be perceptible, would be insignificant, and they would be below the CEQR threshold for a significant adverse impact. In terms of CEQR Noise Exposure Guidelines, noise levels at receptors from 1 through 12 would remain in the “marginally unacceptable” category, and noise levels at receptor 13 would remain in the “acceptable” category.

#### FOREST HILL ROAD AND RICHMOND HILL ROAD CONNECTIONS (2036)

Based on the 2036 noise analysis for the FGEIS, the increase in  $L_{eq(1)}$  noise levels would be less than 1.0 dBA at receptor sites from 1 through 13. At receptor sites 3, 7, 9, 10, 11, and 12, a

decrease in noise levels was predicted to occur for Build conditions due to the decrease in traffic volumes at Arthur Kill Road, Richmond Hill Road, Victory Boulevard, and Travis Avenue. The Build traffic would be expected to decrease at these locations due to the reverse travel pattern caused by the new park roads. At those locations where the proposed project would result in an increase in noise levels, the changes would not be perceptible, would be insignificant, and they would be below the CEQR threshold for a significant adverse impact. In terms of CEQR Noise Exposure Guidelines, noise levels at receptors from 1 through 12 would remain in the “marginally unacceptable” category, and noise levels at receptor 13 would remain in the “acceptable” category.

#### *ACCEPTABILITY OF AMBIENT NOISE LEVELS IN THE PROPOSED PARK*

Noise levels within East Park, at certain locations, would be above the 55 dBA  $L_{10(1)}$ . This exceeds the noise level for outdoor areas requiring serenity and quiet contained in the *CEQR Technical Manual* noise exposure guidelines. Maximum  $L_{10(1)}$  noise levels would be the high 80s dBA at locations near the outdoor amphitheater (when events are taking place in the amphitheatre), maximum  $L_{10(1)}$  noise levels would be the high 70s dBA at locations near the West Shore Expressway, and average  $L_{10(1)}$  noise levels would be the mid 60s dBA at the center area of proposed park. These predicted noise levels would result from the noise generated by traffic on the nearby West Shore Expressway and new park roadways, as well as activities in the new park. There are no practical and feasible mitigation measures that could be implemented to reduce noise levels to below the 55 dBA  $L_{10(1)}$  guideline. However, the noise levels in the new park would be comparable to noise levels in portions of other parks that are also located adjacent to trafficked roadways, including South Shore Golf Course Park, Arden Heights Woods Park, LaTourette Park, and Willowbrook Park. Although the 55 dBA  $L_{10(1)}$  guideline is a worthwhile goal for outdoor areas requiring serenity and quiet, this relatively low noise level is typically not achieved in parks and open space areas in New York City. Consequently, noise levels in the Fresh Kills Park, while exceeding the 55 dBA  $L_{10(1)}$  CEQR guideline value, would not result in a significant adverse noise impact.

### **CONSTRUCTION**

#### *DESCRIPTION OF CONSTRUCTION ACTIVITIES*

##### *Activities Common to Approved and Proposed Closure Plans*

Construction activities associated with the modified closure plan will include the same general construction activities that are required to complete approved final closure design, plus two new utility modifications. In general the landfill closure construction activities that are necessary under both the proposed and existing plans include:

- Cutting and waste relocation to achieve the embankment elevations;
- Filling to achieve the embankment elevations;
- Installation of geosynthetic landfill final cover system;
- Installation of landfill gas system components;
- Construction of stormwater management swales and culverts;
- Installation of vegetation; and
- Construction of DSNY landfill service roads.

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### *Activities Specific to the Proposed Road Embankment (2011)*

Although cut, fill, and waste relocation is currently required to accomplish Landfill Section 6/7 closure construction under the approved final closure plan, the mass grading necessary to achieve the objectives of this modified closure plan would require additional excavation and on-site waste relocation to prepare the embankment surface. In order to maintain the integrity of all landfill infrastructure, allow for ongoing monitoring and maintenance operations, and provide an embankment upon which a future road could potentially be placed, the proposed final cover closure plan includes the following construction activities:

- Placing surcharge along the Forest Hill Road Connection corridor to consolidate and reduce future differential settlement;
- Increasing the barrier protection layer component of the final cover system from two feet to four feet thick along the proposed road corridors;
- Modifying the location of several stormwater conveyance swales and culverts;
- Modifying the location of some landfill service road alignments;
- Modifying segments of the landfill gas management system; and
- Relocating a portion of the existing fire water main and overhead power lines.

Details of the specifics of these measures are provided in the Landfill Section 6/7 Final Cover Design Report, Addendum 1.

### *ANALYSIS OF CONSTRUCTION PERIOD IMPACTS*

#### *Land Use, Neighborhood Character and Open Space*

Fresh Kill Park, East Park, and their associated road corridors are bounded by industrial uses to the west, other park properties to the north, east, and south, commercial uses to the east, and residential neighborhoods such as Travis to the north and Arden Heights to the south. The majority of Fresh Kills is not bordered by residential uses. As it relates to East Park and the project site, sensitive receptors in the vicinity of the project site include parks uses (e.g., LaTourette Park), public uses in the local commercial areas (e.g., the Staten Island Mall), and natural habitats along Main and Richmond Creeks. There are no sensitive residential receptors or community facilities in the immediate area of the proposed project that would be adversely affected.

In order to minimize impacts on sensitive receptors, construction activities (e.g., staging, storage, operations) would be concentrated in the central portion of Fresh Kills Park. These areas allow for centralized access and re-use of areas previously disturbed that are located away from local communities and existing open spaces and natural areas. Construction staging would not need any off-site locations and construction activities would not be expected to impact nearby neighborhoods or parks.

Certain types of construction activities at the periphery of the park (e.g., the road connections at Richmond Avenue) would be potentially noisy for local residents and current parks users at places such as LaTourette Park and some short-term construction activities would also be audible and visible from the local community and park. There are likely to be temporary and localized construction impacts due to construction noise, operation of heavy equipment, construction workers traveling to and from the site, and trucks delivering materials to and removing construction waste from the site. However, the intensity of the off-site impact

decreases with the distance from the site and construction access and traffic corridors would primarily use the West Shore Expressway and internal project site roads to avoid impacts to neighborhoods.

In addition, as discussed below, pursuant to the New York City Noise Control Code, as amended December 2005 and effective July 1, 2007, the adoption and implementation of noise mitigation plans would be required for project construction. Construction activities typically occur between the periods of 7 AM to 6 PM on weekdays, and not on weekends. During construction of the proposed project, no off-site queuing of trucks is expected, and all construction staging would take place primarily within the project site.

Worker vehicles would also use local roads only to access the project area, while construction trucks would use local truck routes and the designated truck entrances to reach the site.

In sum, the local neighborhoods would be sufficiently buffered from construction activity. For these reasons, it is concluded that no potential significant adverse construction period impacts on land use or community character would occur with the proposed project.

#### *Historic Resources*

##### *Archaeology*

Construction excavation may potentially impact subsurface archaeological resources that have been identified at particular locations as part of the Phase 1A Archaeology Study of the site (see Appendix B of the Fresh Kills Park FGEIS). Mitigation for these potential impacts is summarized below. These mitigation measures are to be instituted prior to construction, but can also be incorporated into the construction bid documents, as long as the work is undertaken before construction proceeds.

##### *Architectural Resources*

There are no architectural resources in the vicinity of the proposed modified cover or roads; thus, the proposed project would not impact any architectural resources during construction.

#### *Natural Resources*

##### *Natural Resources Protections: Land-Disturbing Activities*

Construction would result in the following land disturbance activities:

- Land clearing—removal of existing vegetation or other existing cover material;
- Temporary stockpiling of fill;
- Grading and construction of surface drainage systems; and
- Installation of infrastructure.

These activities have the potential to impact terrestrial and aquatic resources through:

- Discharge of stormwater to tidal and freshwater wetlands present within the project site;
- Deposition of fugitive dust resulting from grading activities into terrestrial and aquatic landscapes;
- Physical damage to vegetation outside a project area (i.e., to the above-ground portion of the plants and the below-ground portion of the tree protection zone for trees identified for retention);
- Direct (i.e., physical removal of plant community or grading of soil, loss of individual wildlife due to collision with or as a result of operation of construction equipment) and

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indirect (avoidance of habitats due to noise, vehicle traffic, or other human disturbance) loss of landscape; and

- Potential impacts to natural resources as a result of these activities would be minimized through the implementation of measures and guidelines discussed in the following sections.

### *Measures to Reduce Potential Wildlife Impacts During Construction*

Wildlife use of a particular area would be expected to return upon completion of construction and enhancement activities. Moreover, in the long term, the restored and enhanced landscapes proposed for Fresh Kills Park would be expected to benefit wildlife through the introduction of vegetative cover of higher quality and diversity than currently present within much of the project site.

Strategies to limit wildlife impacts as a result of the above construction activities would depend on the duration and extent of the disturbance. Physical barriers at construction and staging areas, such as drift fencing, would be used to restrict movement of ground-dwelling wildlife (i.e., small mammals, reptiles and amphibians). Direct impacts to wildlife would also be reduced by limiting the speed of construction vehicles, and avoiding nighttime construction operations. Additionally, the phasing of the park road development over a multi-year period would limit the extent of land disturbance and area of in-water construction activities at a given time, increasing the potential that suitable habitats may be available in other areas of Fresh Kills Park.

### *Habitat Protection Plan*

In addition to the above, a natural resources protection plan would be prepared for each capital construction project. This plan would identify landscapes, trees, sensitive plant communities such as wetlands, and any other communities that have been identified for protection under the proposed project and establishes the necessary protection zones around these resources so as to minimize the potential for adverse direct or indirect impacts.

Clearing of staging areas for roadway construction would also be conducted in a manner consistent with minimizing impacts to large trees (e.g., trees greater than 12 inches in diameter at breast height) that are outside areas proposed for construction disturbance.

### *Geology, Soils, and Groundwater*

#### *Proposed Road Embankment (2011)*

Development of the proposed park road embankment across Landfill Section 6/7 is not expected to result in significant impacts with respect to geology, soils and groundwater. These project elements would be built over the man-made Landfill Section 6/7 and would not affect any natural geologic, soils, groundwater conditions.

Landfill leachate is generated by percolation of precipitation through the landfill surface and into the waste material. The percolation volume is minimized through application of best management operating practices for the engineered cover systems. Consequently, excavation and relocation of existing waste to accomplish mass grading along the Yukon Avenue and Forest Hill Road Connection corridors, performed using appropriate best management operating practices, would not increase the volume of leachate required to be managed above the volume managed by the system prior to closure construction.

An examination of leachate volumes during the construction period has also disclosed that the proposal would not significantly increase leachate volumes during the construction of the proposed final cover design.

*Proposed Park Roads (2016 and 2036)*

Development of the proposed park roads is not expected to result in significant impacts with respect to geology, soils, or groundwater. The embankment across the landfill for the project would be developed as part of the modified cover plan. These road segments would be built at or above grade and therefore would not significantly affect local geology, soils, or groundwater.

In addition, cutting and filling would be necessary for the proposed road segments off Landfill Section 6/7. This would primarily involve filling in the off-landfill road segments (e.g., the Forest Hill Road and Richmond Hill Road Connections) in order to create the desired road grades. Protection measures would be provided during construction to prevent sedimentation and erosion impacts during construction grading. Also, since much of the site is engineered, the additional grading would not substantially alter a natural topography. In addition, where grading can be limited through the use of viaduct and other culverts, these road design techniques would be used in order to minimize filling.

Construction monitoring would be implemented to ensure that the construction of the park road elements would protect the existing environmental protection and monitoring systems at Fresh Kills (i.e., landfill gas and groundwater monitoring systems, stormwater basins). This construction monitoring would also ensure that the integrity of the landfill cover remains and that all systems are functioning during road construction, thereby minimizing the potential for adverse impacts to the environment. All park road designs would also be subject to review by DSNY and review and approval by DEC.

*Floodplains*

Neither the development of the modified closure plan or the park roads would impact floodplains. The area of the modified closure is above the floodplain and the road alignments are generally outside the 100-year floodplain with limited exceptions (e.g., the connection at Richmond Hill Road).

*Wetlands and Aquatic Resource Area Impacts*

Overview. Implementation of erosion and sediment control measures described above for each park road element would minimize the potential for significant adverse impacts to both water quality and aquatic resources during construction.

In addition, it is expected that all activities in wetlands (both tidal and freshwater) would require permits for activities in wetlands. This would include permits for tidal wetlands and protection of water, as well as permits from USACE for activities in waterways and wetlands. For all analysis years, construction erosion and sedimentation measures, established in accordance with the Stormwater Pollution Prevention Plan (SWPPP), will be used to control impacts to stormwater runoff during construction. A description of construction period impacts follows.

Proposed Road Embankment (2011). Embankment construction activities across Landfill Section 6/7 would not have any direct impacts on wetlands or indirect impacts on water quality.

Yukon Avenue Connection (2016). Construction of the proposed two-lane Yukon Avenue Connection would not result in any direct adverse construction impacts to wetlands or indirect impacts on water quality. There would be temporary impacts due to construction activities along the basins as well as the installation of the new culvert.

*Completed East Park Road System (2036)*

Completion of the East Park road options would have impacts on wetlands and aquatic resources habitats. Construction of the Forest Hill Road/Richmond Avenue intersection connector, as

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either a two- or four-lane road, would also potentially impact tidal wetlands or adjacent areas within both the Forest Hill Road Connection or the East Park Loop Road options. The option with the least wetland impacts is the Yukon Avenue Connection widened to four lanes. Under this scenario, a limited area of about 0.01 acres in Basin B2 would be impacted. Given the very limited area that is affected, it is expected that this impact could also be avoided through more advanced road design. Mitigation for these impacts to wetland and aquatic resources is summarized below.

### *Forest Hill Road Connection—Four-Lane Road*

The Forest Hill Road Connection under this option crosses over a portion of the freshwater/estuarine wetland system on the east side of Section 6/7. This road segment would impact about 2.54 acres of wetlands through grading and shading. It is anticipated that the crossing of this wetland would be accomplished with a viaduct or arch culvert structure. As currently contemplated, a viaduct structure would be approximately 260 feet long and about 60 feet wide in its crossing of the wetland. Arch culverts would be required at other stream crossings where grade differences prohibit the installation of a viaduct. These emergent wetlands are dominated by *Phragmites* and are not as productive as wetlands dominated by native species. Construction of the viaduct has the potential to result in impacts to wetlands within the viaduct alignment due to activities of construction vehicles and the direct impact of structures within the wetlands. Construction techniques to minimize damage to wetlands would be implemented as part of the construction management plan and in coordination with DEC and USACE requirements, which would be expected during the permitting process (structures in this segment of construction would require wetland permits). For all of these wetland areas, the loss of wetland acreage would be mitigated by the creation of wetland acreage elsewhere in Fresh Kills Park.

### *Richmond Hill Road Connection—Four-Lane Road*

The road segment under this option would directly disturb about 3.09 acres of freshwater wetlands. In addition to this direct construction impact, there would be the potential for additional impact due to construction activities within the wetlands and DSNY basins.

### *Forest Hill Road Connection—Two-Lane Road*

The road segment under this option would directly disturb about 2.16 acres of wetlands through grading and shading. In addition to this direct construction impact, there would be the potential for additional impact due to construction activities within the wetlands themselves.

### *Richmond Hill Road Connection—Two-Lane Road*

The road segment under this option would directly disturb about 2.49 acres of wetlands. In addition to this direct construction impact, there would be the potential for additional impact due to construction activities within the wetlands and DSNY basins.

### *Yukon Avenue Connection—Four-Lane Road*

The road segment under this option would directly disturb a minimal area of about 0.01 acres of wetlands in the DSNY Basin B2. In addition to this direct construction impact, there would be the potential for additional impact due to construction activities in the vicinity of Basins B1 and B2. It is assumed that the culvert has been replaced in the 2016 project phase.

### *East Park Loop Road and Richmond Avenue Connections*

This park road option could potentially directly impact about 1.92 acres of wetlands. In addition to this direct construction impact, there would be the potential for additional impact due to construction activities within the vicinity of both freshwater and tidal wetlands, including

reconstruction activities in the adjacent areas and upland of the tidal wetlands along Main and Richmond Creeks.

*Aquatic Resources Habitats*

The project site contains wetlands including ponds, stormwater basins and emergent wetlands, all of which provide aquatic resources habitats. It is a critical component of the project construction practices to avoid impacts to these natural and engineered systems, not only for the purposes of avoiding impacts to natural resources and water quality, but also for the purposes of avoiding siltation impacts to the existing DSNY stormwater basins. In order to avoid these impacts, the proposed project includes a “Conceptual Site-Wide Erosion and Sediment Control Plan” that will be implemented for the 2016 and 2036 build years. This plan establishes the guidelines by which each phase of project construction, through implementation of the proposed techniques, would avoid impacts to natural features and in-place stormwater management systems. Implementation of these techniques would be ensured not only by DPR, but through the SPDES Permit requirement which is expected to include:

- No increase in turbidity that would cause a substantial visible contrast to natural conditions;
- No increase in suspended colloidal and settleable solids that would cause “deposition or impair waters for their designated best use”; and
- No residue from oil and floating substances.

Each proposed stormwater management plan would be designed to meet the requirements of a SPDES Individual Permit as well as Article 17 of the New York State Environmental Conservation Law and the Federal Clean Water Act. The plan has also been designed to meet the standards of the *New York State Stormwater Design Manual* (DEC, 2003) and the New York State Standards and Specifications for Erosion and Sediment Control (DEC, 2005). DEC would need to review and approve SPDES permits for stormwater discharges associated with road construction activities.

A conceptual site-wide Erosion and Sediment Control Plan was developed to present conceptual erosion and sediment controls that may be used during construction (2016 and 2036).

Certain elements of park construction would require activities in the water. This construction activity is expected to include:

- Construction of stormwater outfalls and aprons.
- Placement of fill material, culverts, and other structural elements within the existing surface waters or wetlands as required for the construction of the proposed park roads, culverts, and viaducts.
- Removal of sediment and grading of shoreline required as part of the proposed wetland enhancement/mitigation activities.

These activities have the potential to impact aquatic resources and wetlands through:

- Temporary increases in suspended sediment and resuspension and redeposition of sediment contaminants during sediment disturbing activities, such as piling installation, bulkhead repair/replacement, and removal of sediment and grading as a result of wetlands enhancement efforts.
- Direct loss of wetlands within the footprint of viaduct and culverts, due to fill material or other structural elements associated with the proposed park roads.

Given the high degree of mixing in the Fresh Kills waterways, any temporary increase in suspended sediment from in-water construction activities is expected to be localized and to dissipate within a short distance of the project activity. In the majority of cases, these activities are also quite limited in duration (1-2 weeks) and impacts would cease upon completion of the in-water (sediment disturbing) activity. Therefore, although temporary short-term disturbances to aquatic habitats and suspended materials in the water column may occur, in-water construction activities would not be expected to result in significant adverse impacts on water quality or aquatic biota during construction. Similarly, any contaminants released to the water column as a result of sediment disturbance would not be expected to result in significant short-term or long-term impacts on water quality in Main or Richmond Creeks.

Life stages of estuarine-dependent and anadromous fish species, bivalves, and other macroinvertebrates are fairly tolerant of elevated suspended sediment concentrations and have developed behavioral and physiological mechanisms for dealing with variable concentrations of suspended sediment (Birtwell et al. 1987, Dunford 1975, Levy and Northcote 1982 and Gregory 1990 in Nightingale and Simenstad 2001a, LaSalle et al. 1991). Fish are mobile and generally avoid unsuitable conditions in the vicinity (e.g., increases in suspended sediment and noise [Clarke and Wilber 2000]). While localized increase in suspended sediment may cause fish to temporarily avoid the area around where piles or other in-water structures are being installed, the affected area would be expected to be small. Similar suitable landscapes would be available for use by fish to avoid the area of in-water construction. Fish also have the ability to expel materials that may clog their gills when they return to cleaner, less sediment-laden waters. Most shellfish are adapted to naturally turbid estuarine conditions and can tolerate short-term exposures by closing valves or reducing pumping activity. More mobile benthic invertebrates that occur in estuaries have been found to be tolerant of elevated suspended sediment concentrations. In studies of the tolerance of crustaceans to suspended sediments that lasted up to two weeks, nearly all mortality was caused by extremely high suspended sediment concentrations (greater than 10,000 mg/L) (Clarke and Wilber 2000) which would not occur from the in-water work associated with the proposed project.

Potential impacts to natural resources as a result of construction activities could be minimized through implementation of the following:

- Measures to minimize increases in turbidity and suspended sediment in the water column, and to capture floating debris during sediment removal and grading activities, and installation of in-water structures. Examples of measures to be considered include silt curtains and coffer dams. Measures would be selected on the basis of on-site conditions and consultation with DEC and USACE.
- Implementation of measures to stabilize the wetlands enhancement areas as necessary during planting, such as the use of biodegradable/geosynthetic erosion control mats or revegetation mats.
- If necessary, implementation of measures that may restrict or limit the construction activities in water or sensitive landscapes during certain seasons.

In addition, it is recognized that all construction activities within open waters or other wetlands are subject to the review and approval of DEC and USACE and federal natural resource agencies through the permitting process that would further identify and implement these and other protection measures necessary to protect water quality and sensitive landscapes.

### *Significant Coastal Fish and Wildlife Habitat*

Construction of the proposed modified closure plan and park roads would not be expected to conflict with the Fresh Kills Significant Coastal Fish and Wildlife Habitat. During construction, with the proposed construction protection measures in place, the tidal creeks of this designated landscape would continue to provide spawning and nursery opportunities for anadromous, estuarine, and resident fish, and would continue to be used by wading birds, waterfowl, shorebirds, raptors, and passerines. In addition, all proposed in-water activities would be subject to permitting by the DEC and USACE for the purposes of protecting wetlands and water quality and would require the input of the DOS with respect to coastal policies and protection of significant coastal fish and wildlife landscape. Each capital park project would be reviewed on an individual basis as part of its permit review. For these reasons, it is concluded that the proposed project would not conflict with this designation during construction.

During construction, the tidal creek systems of Main and Richmond Creeks would continue to provide spawning and nursery landscape for anadromous, estuarine, and resident fish, and would continue to be used by wading birds, waterfowl, shorebirds, raptors, and passerines. In addition, no indirect impacts to water quality and the Significant Coastal Fish and Wildlife Habitat are anticipated during construction.

### *Terrestrial Resources*

#### *Proposed Road Embankment (2011)*

The modified cover closure construction would essentially occur on top of the landfill in areas already disturbed by an interim cover and proposed to be disturbed under the approved cover plan in the No Build condition. Thus, it is concluded that construction of the modified cover plan would not have any impacts on terrestrial resources.

#### *Yukon Avenue Connection (2016)*

Construction of the Yukon Avenue Connection across Landfill Section 6/7 would occur on a developed embankment. It would not have any direct impacts on terrestrial resources.

For the segment between the base of the landfill and Richmond Avenue, there would be limited direct impacts (i.e., clearing and physical removal of plant communities or grading of soil within the roadway alignments, loss of individual wildlife due to collision with or as a result of operation of construction equipment) and the potential for indirect impacts (avoidance of habitats due to noise, vehicle traffic, or other human disturbance) to wildlife. The proposed project has been designed to minimize direct clearing impacts to the extent possible by utilizing existing disturbed corridors, such as the Yukon Avenue Connection, thereby limiting impacts to terrestrial resources. Thus, clearing of resources in this road segment would be minimized and not significant.

While certain wildlife individuals may avoid undisturbed landscapes in the vicinity of road construction due to noise, vehicle traffic or increased human activity, this is also not expected to be a significant impact in this area.

#### *Completed East Park Roads (2036)*

Construction of the Forest Hill Road Connection across Landfill Section 6/7 would be on top of the interim DSNY service road and adjacent meadow cover maintained as part of the modified final closure. This segment of road would therefore not have any direct impacts on terrestrial resources.

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The segment of the Forest Hill Road Connection between the base of the landfill and east to Richmond Avenue would occur within an area of wetlands (see the discussion above) and terrestrial habitats, including the Richmond Avenue berm and wetlands. This berm includes a linear wooded area along Richmond Avenue that contains planted white pine, Douglas fir, and Norway spruce. This section of the proposed Forest Hill Road Connection would span an area of mixed upland and wetlands that contain a mix of habitats including native and non-native scrub-shrub and *Phragmites*. The proposed park road segment would be directed through woodlands along the berm and in the southern end of the 0.5 acre forested area, resulting in removal of few large trees (i.e., greater than 12 inches diameter at breast height) in this vicinity. The small loss of landscaped habitat associated with the roadway construction would not result in significant adverse impacts to wildlife resources.

Construction of the Richmond Hill Road Connection also has the potential to result in direct impacts (i.e., clearing and physical removal of plant communities and soil grading) as well as potential loss of individual wildlife due to collision with or as a result of operation of construction equipment as well as indirect impacts (i.e., avoidance of habitat due to noise, vehicle traffic, or other human disturbance). However, construction of the Richmond Hill Road Connection would result in minimal impacts on terrestrial resources in the section along the Richmond Avenue berm. This small loss of habitat associated with the road construction would not result in significant adverse impacts to wildlife resources.

Completion of the East Park Loop Road would also not be expected to have any impacts on terrestrial resources since it largely would largely follow an alignment of built DSNY service road surfaces. Thus, it would not impact any terrestrial resources.

### *Threatened or Endangered Species*

Construction of the modified closure plan, the Yukon Avenue Connection, or any of the East Park roads options would not result in significant adverse impacts to colonial water bird nesting activity on Isle of Meadows, or inhibit the re-establishment of such activity in the future. Barn owls have nested on bridges in the vicinity of Richmond Creek in recent years. None of the analysis scenarios would impact these species. Thus, it is concluded that construction of the East Park Roads would not have any impacts on threatened or endangered species.

### *Hazardous Materials*

Development of the proposed East Park roads would involve excavation and disturbance of the existing on-site soils as part of construction activities. This could result in temporary increases in exposure pathways for workers and nearby residents. To avoid this impact, preventative measures would be undertaken to protect the safety of the workers and local residents as well as the larger environment for areas where construction activity has the potential to encounter areas of contamination. To this end, the environmental issues with respect to hazardous materials conditions as identified at the project site during the current and previous environmental studies (see also the *Fresh Kills Park FGEIS*) would be remediated prior to the road construction with respect to the off-mound segments of road construction.

To that end, prior to construction, site investigations for hazardous materials would be performed (as necessary) and a site-specific Construction Health and Safety Plan would be prepared. It would include health and safety procedures to minimize exposure to workers and the public, including possible dust monitoring and/or VOC monitoring, if applicable, and provisions for the identification and management of known and unexpected buried tanks or contaminated

materials that might be encountered during the soil disturbance activities associated with construction. Such a plan would ensure that the construction workers, the surrounding community, and the environment are not adversely affected by environmental conditions exposed by or encountered during the construction activities. In addition, existing fill remaining on-site would be either covered with two feet of certified clean fill (e.g., road landscaped edges) or covered by structures such as road pavement. With these proposed measures in place, the health and safety of construction workers and the visiting public would be protected from adverse environmental conditions during construction.

*Infrastructure: Proposed Road Embankment Construction*

*Nuisance and Vector Management*

It is recognized that grading activities, which are necessary to achieve the proposed cover design subgrade elevations, will encounter waste. The associated excavations and on-site waste relocation activities have the potential to create odor nuisances and attract vectors. However, these issues also exist as part of the work necessary to construct the final cover as described in the Final Cover Design Report (Malcolm Pirnie for DSNY, 2001). Consequently, specifications to establish acceptable construction procedures and mitigation techniques are also provided in that report, specifically, in Section 02224, Solid Waste Relocation.

The presence of putrescible materials in the waste makes it potentially attractive to animal life, particularly to vermin, insects, and predatory and scavenging birds. The management of the waste excavation and spoil locations recognizes these possible effects and controls these vectors through proper sanitary landfilling procedures. Specifically, the speed of deposit, compaction, and covering of the wastes minimizes or eliminates the effects. Compacted waste does not provide the habitat desired by vermin such as rats and mice, and well-covered lifts of waste prevent disturbances of the surface by birds and animals by eliminating their access to a potential food source. The suppression of insects is also achieved by the prompt application of cover soils, which buries them and their breeding areas.

Odors from the decaying materials in the landfill will continue to be controlled by the landfill gas collection system, which collects the decomposition gases as they are generated within the landfill mound. The collected gases are principally processed at the Fresh Kills Landfill Gas Purification Facility, where odorants and contaminants are removed from the landfill gas and the gas is separated into methane and carbon dioxide—two odorless gases. This system will continue to operate during construction in accordance with the facility’s permits, which regulate landfill gas emissions.

While the landfill gas collection system will prevent gaseous emissions from the landfill, odors may still result from the volatilization of odiferous compounds from the excavation, and transport and placement of the excavated garbage. The off-site impact of these odors would be mitigated by the following:

- Placing the excavated material toward the interior of the site to avoid potential off-site receptors;
- Limiting the excavation and spoiling areas to match daily construction progress;
- Covering both the excavation and spoiling areas with a daily cover to suppress odors; and
- Applying an odor suppressant as necessary to further abate off-site impacts.

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The following subsections describe additional measures that have already been established by the DSNY as a part of site operation activities or landfill final cover construction that are used to manage nuisance conditions.

*Incident Weather.* Incident weather, such as heavy rains, snow, ice conditions, high winds, or extreme temperatures may impact on the construction operations. Additional procedures that may be implemented in these conditions are as follows.

- Heavy rains. Following heavy rain events, drainage channels, culverts, and erosion and sediment control features are inspected for sediment and debris that may block water flow. Blockages are removed as necessary, and the integrity of the systems restored.
- Heavy snow. Snow accumulation is cleared from the work area, as needed, for work to progress in accordance with the Construction Quality Control Plan.
- Ice conditions. If adverse weather creates dangerous icing conditions, work is stopped.
- High winds. During periods of high winds, the extent of the waste relocation excavation area is minimized to reduce the possibility of blowing litter. After periods of high winds, the site will be inspected for blown litter and the observed blown litter collected.

*Litter and Debris Control.* During waste relocation activities, the following litter and debris controls are employed.

- Blown litter and debris are collected on a daily basis. Collected litter originating from the excavation work is landfilled with other relocated waste.
- Debris Control. Debris that falls off waste transportation vehicles is collected and landfilled with other relocated waste.
- Scavenging. No waste scavenging is allowed.

*Dust Control.* Dust control activities that have been employed to ensure safe on-site working conditions have proven effective at avoiding off-site impacts. These measures include the following:

- Existing aggregate or stabilized DSNY service roads are used for transporting relocated waste and construction materials to the greatest extent possible; additional temporary roads of aggregate and/or asphalt millings are constructed for areas of extensive and extended construction traffic to limit the generation of dust and facilitate access.
- Dust is suppressed primarily through the application of water to roads, and other surfaces from which dust could be generated. A truck equipped with a portable water storage tank (water wagon) is used periodically to dampen these surfaces, as conditions warrant.
- As necessary, a power broom is used to remove accumulated soil from paved roadways in order to minimize dust generation.

*Vector Control.* Vectors such as birds, rodents, and insects can be attracted to putrescible wastes exposed during the relocation activities. Vector control during construction activities associated with the alternate design will be performed in accordance with the Landfill Section 6/7 Final Cover Design Report (Malcolm Pirnie, 2001), Vector Control Plan. Some of the primary vector control methods are described below:

- Daily cover is placed over all waste each workday. Typically, the cover over the spoiled waste consists of a minimum of six inches of soil. A sufficient stockpile of cover soils is available near the excavation and disposal areas to meet the day's activities. In order to

expedite completion of the excavation work, tarps, or other approved alternate daily cover materials, may be employed as daily cover at the excavation locations.

- Good housekeeping measures are implemented during waste relocation activities to eliminate conditions that could attract vectors, and the measures modified as conditions may require.
- The working area for both excavation and landfilling are minimized to what can be reasonably worked in the day to limit the area of exposed waste.
- Should rodents and insects develop to become a vector problem during waste relocation activities, control measures specific to the identified problem will be implemented to avoid infestation, including the application of pesticides in accordance with New York City and New York State Departments of Health requirements.

Additional procedures will be employed during the mass excavation and relocation of waste. These procedures include the following:

- Inspection personnel will monitor the excavation and disposal areas for scavenging birds and other potential vectors, and maintain a record of daily observations. This information will be reviewed to determine if there is an increasing pattern of vector activity in the work areas. If the potential vector population continues to grow, the inspections will be expanded to the perimeter of Landfill Section 6/7 to scope the extent of additional control measures.
- Should scavenging and/or predatory birds present an interference with the work or a vector threat to surrounding neighborhoods, the work areas will be further restricted, and additional measures will be developed and implemented in consultation with a wildlife biologist to address the problem.

Odor Control. Landfill gas emissions will continue to be controlled by the landfill gas collection system. While cover soil is expected to sufficiently suppress odors from the excavated and landfilled garbage, chemical odor suppressants, as described in the approved Final Cover Design Report (Malcolm Pirnie, 2001), Technical Specification Section 02224, will be used as necessary to further prevent odors from creating an off-site nuisance. Odor control materials will be used in accordance with manufacturer recommended procedures.

Noise Control. In accordance with Part 360-1.14(p), noise levels resulting from equipment or operations will not exceed 67 decibels (A) beyond the property line during construction between 7:00 AM and 6:00 PM. Noise levels will also comply with local laws.

*Yukon Avenue Connection Road Construction (2016)*

With the 2011 final cover construction completed, the proposed Yukon Avenue Connection would not require any additional modifications to landfill infrastructure for the segment of road crossing the landfill. For the segment of road between the base of the landfill and Richmond Avenue work would encroach upon the existing service road that provides access to environmental monitoring points located to the north of the alignment. No monitoring points are located within the proposed alignment and therefore no further modifications to the landfill infrastructure would be required.

*Completed East Park Road System Construction (2036)*

With the 2011 final cover construction completed, the proposed Forest Hill Road Connection would not require any additional modifications to landfill infrastructure for the segment of road crossing the landfill.

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For the segment of the Forest Hill Road Connection between the base of the landfill and Richmond Avenue the alignment would encroach upon the landfill gas vent trench. To mitigate these encroachments, a gravel venting layer would be placed above the landfill gas vent trench to ensure a permeable conduit to the surface. Placement of fill soil or pavement over a limited section of the gas vent trench is consistent with as-built conditions along the vent trench. Therefore, the fill placement on top of the permeable layer would not compromise the vent trench's ability to function.

For the segment of the Richmond Hill Road Connection between the base of the landfill and Richmond Avenue the alignment would pass near groundwater monitoring wells 154D, 174S, and 153D. The alignment would also pass by gas migration monitoring wells G-44, G-17, G-18, G-46, and G-19. Each of these landfill monitoring systems would be protected during construction.

### *Solid Waste*

It is not expected that significant demolition debris would be generated by the proposed road construction. Solid waste from construction would primarily be packaging and some residual debris with materials brought onto the site. All construction waste would be handled by private carters who would haul and dispose of the materials in full accordance with the applicable regulatory requirements. In addition, there would be the recycling of cut trees and vegetation for use as park mulch. The City has an active program to reduce solid waste generated by construction sites.

### *Energy*

Energy impacts due to construction are primarily a result of the energy required to manufacture, deliver, and install the materials at the construction site. Approximately 70 percent of the energy during construction is attributable to the manufacture of the basic construction materials and components. The remaining energy demand is divided among direct fuel purchases, wholesale and retail trade, business and professional services, transportation of materials, and operation of construction machinery and equipment. Almost all (approximately 99.5 percent) of the energy is consumed before the material reaches the construction site. Construction of the proposed project over the course of 30 years is not expected to have a significant impact on energy demands for the City or region.

### *Traffic and Parking*

#### *Introduction*

This section of the construction impacts analysis evaluates whether construction-related traffic from the proposed project would significantly impact local traffic and parking conditions. Construction of the proposed park roads would generate traffic in the study area, including construction workers commuting by car, and construction trucks making deliveries to and from the project site, and the delivery and removal of soil with the greatest volumes of delivery occurring with the enhancement importation of base soils and road building materials.

Project-generated construction trips would occur due to construction trucks delivering soils and equipment, delivery of materials, and construction workers commuting to the job site. The truck activities are expected to be distributed evenly throughout the day, while the construction worker trips would likely be concentrated in two peak time periods—the early morning arrival period between 6:00 and 7:00 AM and the early afternoon departure period between 3:00 and 4:00 PM. During the work day, some discretionary travel may also take place (e.g., lunch), but the number of trips is likely to be substantially lower than the peak hour levels. The principal means of access to

the site are expected to be the West Shore Expressway (regional), including the mainline and service roads which would be used to then access the project's internal service roadways.

*Projected Travel Patterns of Construction-Related Traffic*

Construction workers are expected to access the site primarily from the West Shore Expressway although some may reach the site by local roads. However, it is noted that for the 2016 program, other than the park projects at the site periphery, the site would not be accessible to vehicles from the local roads (i.e., there would not be any access from Richmond Avenue).

Given the site's access and egress opportunities to the regional highway network, most construction-related traffic would not be expected to use local streets. Arriving and departing autos would primarily reach and exit the site via the West Shore Expressway connections to the project site and then use landfill service roads within the site. For any off-site locations where service conditions might be affected by project-generated construction traffic, the impact would be temporary and short-term. Details of site access would be coordinated between DPR and the contractors with the assistance of NYSDOT and NYCDOT.

*Worker and Truck Trips*

Construction activities would generate a modest amount of traffic during the peak hours during both the construction of the proposed park elements and the proposed roads. In addition, construction workers generally arrive before the peak morning commuter peak traffic period and depart before the peak afternoon commuter peak traffic period, with limited weekend work. Therefore, these vehicle trips generally do not affect the local traffic network. In addition to the worker commutes, there would also be trucking activity associated with the delivery and removal of soils (particularly the delivery of soils), and there would also be the delivery and removal of materials during the demolition of buildings, the construction of buildings, and the construction of the proposed viaducts. As also described above, given the size of the project site, it is expected that the delivery of all soils and materials that are expected to be necessary for the proposed project could reach the site via the West Shore Expressway and once on site could reach the work location for that particular phase of construction via the internal roadways, thus minimizing impacts on the surrounding neighborhood.

These truck movements would be spread throughout the day and would vary depending upon the period of construction. However, as described above, it is expected that 70 to 100 trucks per day, or about 10 per hour, would be providing deliveries to the site during the more intense periods of construction, particularly with respect to the importation of soil. Truck deliveries would be dispersed over the day with few occurring in the peak hours.

Regarding worker vehicles, conservatively assuming that all workers would travel to the site via automobile as single occupants, the daily trip generation would be about 50 to 100 vehicles during the more intensive periods of construction. With the proposed direct access to the West Shore Expressway that would provide access to central parking facilities, these trips would require limited use of local roads during peak periods. It is therefore expected that construction vehicle traffic from the proposed park would not significantly impact local roads. As stated above, most of the trips associated with construction would not coincide with the traditional commuter peak travel hours. Construction workers typically arrive between 6:00 and 7:00 AM and leave between 3:00 and 4:00 PM. This minimizes the likelihood of any significant increase in peak period traffic congestion due to construction.

*Traffic Maintenance During Construction*

With the proposed construction program, access to the project site would be gate-controlled and some streets may be temporarily closed or have lane closures at the periphery of the site for the construction of new intersections (e.g., the re-construction at the intersections along Richmond Avenue), as well as the installation of utility connections (e.g., water, sewer, gas, electric) at the periphery of the site. During these limited periods of construction impact, major roads, such as Richmond Avenue, would have at least one lane open to traffic at all times. The temporary and limited closure of travel lanes is an unavoidable temporary impact on the local traffic network.

In addition, nighttime construction may be considered at high traffic locations along Richmond Avenue in order to minimize disruption to traffic. This would be a consideration at final design and proposed (if appropriate) as part of the construction approval process with NYCDOT and NYSDOT.

*Parking*

The surrounding area contains primarily open spaces and low-density residential uses that generate little on-street parking demand traffic throughout the day. However, it is expected that parking would be provided on the project site in order to avoid any impacts on local on-street parking conditions. Thus, during the proposed construction period, parking demand in the vicinity of the project site would be similar to existing levels. As discussed above, with limited exceptions such as the construction of the small neighborhood parks, all construction worker vehicle parking is expected to be accommodated in the central staging areas.

*Air Quality*

*Introduction*

Construction activities have the potential to impact local air quality as a consequence of emissions from stationary on-site equipment, emissions from construction vehicles on site and traveling to and from the site, as well as emissions from worker vehicles. For example, most construction engines are diesel powered, and produce relatively high levels of particulate matter. As a result, air quality impacts could occur on the surrounding area due to on-site sources as well as traffic that could also increase mobile source-related emissions. In addition, construction activities also emit fugitive dust.

The construction of the proposed project would be subject to Local Law 77 of 2003. Thus the potential for particulate emissions would be controlled by required emission controls and ultra-low sulfur diesel (ULSD). In addition, it is acknowledged that as a longer-term construction project there will continue to be advances in air pollution control for construction equipment, as well as turnover and replacement with newer vehicles and equipment that would further reduce emissions from construction vehicles.

City regulations would require all project contractors to reduce particulate matter emissions to the extent practicable by employing relatively new equipment including diesel oxidation catalysts (DOCs). As stated above, the construction activities would all 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.<sup>1</sup>

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<sup>1</sup> 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 ULSD, and utilize the best available technology (BAT) for reducing the emission of pollutants, primarily particulate matter and

*Fugitive Emission Sources*

Fugitive emissions can result from land clearing operations, such as excavation, hauling, dumping, spreading, grading, compaction or wind erosion and traffic over unpaved areas. The EPA suggests a general overall emission rate of about 1.2 tons of particulate matter per month per acre for construction sites with significant land clearing operations and no fugitive dust control measures. However, this is a national estimate and actual emissions vary widely depending on many factors. In addition, the proposed project would include techniques to reduce fugitive emissions during construction.

The proposed project would require soil importation and filling, excavation, site grading, and repaving. With the exception of truck traffic, no construction activities would occur adjacent to residential areas. At the project site, there are substantial buffers between the project site and local sensitive receptors (even the commercial receptors are separated by a wide heavily traveled road, Richmond Avenue), and recognizing that fugitive dust generated by construction activities consists of relatively large-size particles that settle on the ground within a short distance from the construction activity, fugitive dust emission impacts on the surrounding community should not be significant.

Moreover, because fugitive dust is a common impact of construction, it is also regulated under New York City's code. During construction, all appropriate fugitive dust control measures—including watering exposed areas and using dust covers for trucks—must be used to satisfy Section 1402.2-9.11 of the New York City Air Pollution Code.

Increases in concentrations of particulate matter are difficult to quantify accurately because of the difficulty in determining total emissions and the wide range of size of the particles emitted. However, since much of the fugitive dust generated by construction activities consists of relatively large-size particles, that dust would settle to the ground within a short distance of the construction site and would not adversely affect residential areas or community facilities which are some distance from the road construction site. In addition, dust-control procedures, including stabilization of exposed areas, the frequent watering of affected areas, and the use of dust covers for trucks, would be required as part of the construction contract documents so that only minimal increases in ambient concentrations of particulate matter would occur.

Because contaminated materials exist in some project areas, more extensive dust control measures and perhaps monitoring would be employed when contaminants in soils are identified. When construction occurs in these areas, it is expected that a health and safety plan would be developed specifically designed to reduce the risk to the public and construction workers at particular sites where contaminated materials may be present and may also include a monitoring plan, where necessary.

*Mobile Source Emissions*

Gaseous hydrocarbon and NO<sub>x</sub> emissions from construction equipment, private vehicles of construction workers, and delivery vehicles at the construction sites would not be expected to impact local air quality. The small localized increases in hydrocarbon and NO<sub>x</sub> emissions during the construction process caused by these sources would be insignificant when compared with total regional levels of these pollutants. Thus, these increases are expected to have a negligible effect on regionwide concentrations of photochemical oxidants.

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secondarily nitrogen oxides. NYCDEP is charged with defining and periodically updating the definition of BAT.

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### *Odors and Methane*

Methods to control odors during construction are described above. Appendix E to this SEIS, “Supplemental DEC Data,” also includes information on gas emissions during construction. As shown by that data, the proposed project would not result in any significant adverse air emissions during the construction period for the final cover.

East Park Road System (2016 and 2036). With the embankment in place, no additional disturbance of the landfill cover would be necessary. Thus it is not expected that construction of the road final grade and finishes would result in any significant odor or methane impacts. Consequently, landfill gas and waste odors will be managed by the continuous operation of the landfill gas extraction and collection system.

### *Noise*

Impacts on community noise levels during construction can result due to noise from construction equipment operation and from construction vehicles and delivery vehicles traveling to and from the site. Construction activity generates noise from the construction equipment, construction vehicles, worker traffic, and deliveries of soils and materials to and from the construction site. Noise and vibration levels at a given location would depend on the number and types of construction equipment being operated, the acoustical utilization factor of the equipment (i.e., the percentage of time a piece of equipment is operating), the distance from the construction site, and any shielding effects (shielding due to structures, elevated topography, or natural barriers). Noise levels caused by construction activities would vary widely, depending on the phase of construction and the location of the construction relative to receptor locations. Typically, the most significant noise associated with construction is jackhammers and pile driving. (These activities would not occur within the road segments over the landfill, but for the off-landfill road segments, such as the Forest Hill Road Connection and pavement work at the intersections with Richmond Avenue, for example. It is expected that these details would be provided as part of a more advanced road design that would be subject to a separate environmental review). Noise impacts would be the result of individual project construction phases and sequences and the location of each phase of construction relative to the project site boundaries; the particular construction tasks with in each phase, including the types and number of construction equipment specific to each task, recognizing that the construction of the road would progress geographically. For example, the use of jackhammers is expected to be very limited, perhaps for the breaking of pavement to provide utility connections at select locations.

In addition, pile driving (or drilling) would occur, but also at select locations for the construction of the viaducts and possibly culvert crossings for the Yukon Avenue, Forest Hill Road and Richmond Hill Road Connections; however, these activities are well removed from the local neighborhoods. Pile activity nearer local neighborhoods would be limited to lighter activity and shorter duration, such as the construction of a small dock in North Park.

Noise levels associated with the construction of the proposed project would be subject to the noise emission source controls of the recently revised New York City Noise Control Code. This code specifies maximum sound pressure levels at receiving properties (designated by octave band levels). The *CEQR Technical Manual* also provides guidance for examining the incremental noise impacts, and comparisons with NYCDEP’s external Noise Exposure Guidelines. Finally, the City of New York’s Zoning Resolution sets octave band limits for the lot line of a property. Construction equipment is also regulated by the Noise Control Act of 1972.

The New York City Noise Control Code, as amended December 2005 and effective July 1, 2007, requires the adoption and implementation of a noise mitigation plan for each construction site, limits construction (absent special circumstances as described below) to weekdays between the hours of 7 AM and 6 PM, and sets noise limits for certain specific pieces of construction equipment. Construction activities occurring after hours (weekdays between 6 PM and 7 AM and on weekends) may be authorized in the following circumstances: (i) emergency conditions; (ii) public safety; (iii) construction projects by or on behalf of city agencies; (iv) construction activities with minimal noise impacts; and (v) where there is a claim of undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts and/or financial considerations. It is not anticipated that extended hours (6:00 PM through 7:00 AM) would be needed for construction of the proposed project on a regular basis.

Noise from construction activities and some construction equipment is regulated by not only the New York City Noise Control Code but also by the EPA. The EPA requirements mandate that certain classifications of construction equipment meet specified noise emissions standards. These federal requirements mandate that: (i) certain classifications of construction equipment and motor vehicles meet specified noise emission standards; and (ii) construction material be handled and transported in a manner that does not create unnecessary noise.

#### *Construction Noise Impact Assessment*

Construction activities for the proposed project would be expected to result in increased noise levels as a result of: (i) the operation of construction equipment on-site; and (ii) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the surrounding roadways.

As discussed above, the City has recently updated its Noise Control Code (effective July 1, 2007). Thus, the construction associated with the proposed project would be subject to the requirements of the new City Noise Control Code. Outlined below is a list of source control noise reduction measures that may be proposed to meet those noise reduction requirements.

While the level of construction noise associated with the type of construction activity depends on the numbers and type of equipment employed at any time, noise levels associated with construction may occasionally be noticeable to nearby residents, particularly during the times when jackhammers and/or other pavement-breaking equipment are used. Significant ambient noise level increases along streets where construction activities are taking place can reach up to 98 A-weighted decibels (dBA) under worst-case conditions (pavement breaking at 50 feet). However, given the type of construction that is expected with the proposed project, limited use of higher noise generating equipment is expected since most activities would occur in areas not previously covered by paved surfaces. In most cases these types of impacts would be related to the installation of utility connections, or street connections at Richmond Avenue or Arthur Kill Road, for example.

Temporary noise increases from more significant noise generating equipment can be intrusive to nearby residents at distances of up to about 400 feet from the activity. However, there are no cost-effective measures that can be implemented to effectively eliminate temporary noise increases of this type which occur throughout the city as part of the construction process. In addition, construction of the road, for example, would largely take place at the interior of the site and would not require any substantial use of jackhammers or pavement breaking equipment.

Noise levels also increase/decrease exponentially over distance. Thus, they decline by an estimated 2–4 dB with each doubling of distance from the source. Thus, sound pressure levels after peaking at the front of the construction site would drop by 2–4 dB at a distance of 100 feet.

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Once the construction has moved to 200 feet away, the sound pressure levels would decrease by 4–8 dB. While this level would continue to affect the ambient noise levels of the generally quiet neighborhoods, the decreasing noise levels and distance from the receptors would limit impacts. Therefore, although elevated noise levels are considered a nuisance and would be intrusive at times to local residents, these impacts would be short-term and are not considered a significant adverse impact. In addition, most park road construction would occur within the interior of the Fresh Kills site itself. The exception would be the connections to Richmond Avenue. However, these connections would be to Richmond Avenue along a heavily traveled vehicular corridor and fronting a commercial area. Thus, no noise impacts would be expected for any sensitive land uses along this corridor. Where construction noise would be most evident is in the northern segment of the East Park Loop Road in the road segment that is nearest the William T. Davis Wildlife Refuge. Here, additional measures may be necessary in order to avoid any impacts to the nearby park and wildlife resources. These impact avoidance measures could be examined as part of a more advanced design and environmental analysis for this phase of the proposed project.

As described above, all construction equipment and vehicles must also meet the City, State, and Federal regulatory requirements regarding noise emissions, and construction activities would be limited to weekdays between the hours of 7:00 AM and 6:00 PM.

In terms of potential source controls (e.g., reducing noise levels at the source or during most sensitive time periods), the following types of measures could be implemented as part of a noise control plan:

- NYCDEP, in its review of the noise control plan, would require all contractors and subcontractors to properly maintain their equipment.
- DPR could require all contractors and subcontractors to properly maintain their equipment and have quality mufflers installed;
- Noisy equipment, such as generators, cranes, concrete pumps, concrete trucks, and dump trucks, should be located away from and shielded (as necessary) from local neighborhoods which are the only existing sensitive receptor immediately adjacent to the construction site and used to the least extent possible; and
- Noise curtains and equipment enclosures could be utilized to provide shielding to sensitive receptor locations as necessary.

Based on the above, it is concluded that construction period noise emissions would be limited to the extent practicable and performed in accordance with all local, State and Federal laws and practices. The proposed project would also make use of the project site to avoid impacts on the surrounding neighborhoods and sensitive receptors. Thus, it is concluded that although short-term noise impacts would be selected for certain capital projects, the overall construction noise impact of the proposed project should not be significant.

### *Vibration*

Vibrations generated by construction activities, generally within one thousand feet of existing buildings, may be perceptible or potentially damaging to structures. No blasting would be performed as part of the proposed project; however, pile driving, or drilling, may be necessary for certain segments of road, such as the viaduct for the Richmond Hill Road Connection. These pile construction activities would be off-mound. Vibration levels from pile drilling or driving and the potential for impacts on a receptor are a function of the source strength (which in turn is dependent upon the construction equipment and construction methods utilized), the distance

between the equipment and the receptor, the characteristics of the transmitting medium, and the type of construction at the receptor. Construction equipment operation causes ground vibrations which spread through the ground and decrease in strength with distance. Vehicle traffic, even in locations close to major roadways, typically does not result in perceptible vibration levels, unless there are irregular road surfaces. With the exception of the case of fragile, historically significant structures or buildings, generally construction activities do not reach the levels that can cause architectural or structural damage, but they can achieve levels that may be perceptible and annoying in buildings very close to a construction site. Since no blasting is proposed the greatest vibration activity is expected to travel a distance at no more than two hundred feet (pile driving). Thus, no vibrations are expected to affect local residences. As necessary, impact avoidance and pre-construction inspection would be made for the protection of landfill infrastructure and, if required, alternative means of installing support piles, including drilling, may be preferred (see also the discussion above under “Landfill Protections During Construction”). These measures would be presented as part of the more advanced designs for the long-term phases of the East Park road design and construction plans.

#### *Public Health During Construction*

Potential construction period public health impacts due to air and noise pollutant emissions can stem from construction equipment and construction vehicles. Of particular concern is the potential for diesel emissions with particulate matter from construction-related activities to impact public health (such as increasing asthma rates). In response to those concerns, as described above, the City has adopted Local Law 77, which would result in significant reductions in air pollution from construction equipment throughout New York City and including the proposed project.

Construction activities associated with the Landfill Section 6/7 Final Cover Design Report, Addendum 1 performed using appropriate best management practices, would not increase the volume of leachate required to be managed above the volume managed prior to closure construction. (Appendix E to this SEIS, “Supplemental DEC Data,” also includes additional information on construction period leachate generation.) Likewise, the construction of the proposed roads would take place on prepared embankment and would therefore not increase the volume of leachate.

With the odor protection measures in-place during the construction of the modified Landfill Section 6/7 cover and embankment and no additional disturbance of the landfill cover for the proposed roads, it is not expected that construction of the proposed project would result in any significant odor or methane impacts.

Odor and methane emissions are closely related because odor causing compounds are emitted with methane from landfill gas. Therefore, odor protection measures in combination with measures designed to maintain collection of methane during the construction of the modified Landfill Section 6/7 cover and embankment will address potential methane emissions. As a result, it is not expected that any significant methane impacts will result from the proposed construction activities.

During the construction phase, as necessary, the contractor would carry out a maintenance program for vector control. Public health issues related to hazardous materials would also be addressed, as discussed above.

For all the above reasons, it is concluded that with proposed impact avoidance and protection measures in place, no public health impacts would occur during the three phases of project construction.

## **PUBLIC HEALTH**

While municipal solid waste landfills are well documented as potential sources of pollution, environmental control and management and techniques, such as those practiced at Fresh Kills, including landfill leachate treatment and gas collection and treatment as well as stormwater management, coupled with regular groundwater and air monitoring significantly reduce environmental impacts, facilitate the timely identification of potential problems associated with the control management systems, and thus minimize the transmission of pollutants to humans along the known exposure pathways. The existing environmental protection infrastructure at Fresh Kills includes an active landfill gas collection system complete with underground piping to collect the gas and direct it to the landfill gas recovery plant or flares, as well as leachate and stormwater control systems and an extensive monitoring and maintenance program.

These in-place protections would continue to operate for at least 30 years, and will be protected and maintained during the park construction phases and as the park becomes accessible to the public. It is expected that it will be necessary to implement additional measures to both protect the landfill infrastructure (e.g., protection and replacement of infrastructure due to the construction of roads and park facilities, restricting public access, and increased monitoring of air and water conditions) and to ensure that as areas of the proposed park become publicly accessible, they do not present a public health risk or safety concern. Therefore, completion of closure construction and the post-closure landfill monitoring and maintenance activities is vital not only to the proposed project, but also to the successful completion of the City's post-closure monitoring and maintenance obligations with respect to Fresh Kills Landfill.

The environmental protection infrastructure associated with the closed landfill section includes leachate and landfill gas collection, final cover, drainage management and monitoring systems. A detailed evaluation of potential public health impacts was performed as part of the *Fresh Kills Park FGEIS* to evaluate potential impacts with respect to air quality, groundwater, surface water, and sediments/soils and the potential contaminant pathways and possible public health effects. The principal conclusions of that analysis are summarized below:

- Air emissions: air emissions from local stationary sources including the landfill itself would not be expected to result in any significant adverse air quality impacts to the public.
- Groundwater: while contaminated groundwater is known to exist within the boundaries of the project area, the analysis performed as part of the Fresh Kills Park FGEIS found that it does not pose a significant public health risk to park users. This is based on the fact that groundwater is not currently, nor is it envisioned in the future, to be utilized as a supply of potable water. Leachate treatment systems for the closed landfill mounds will continue to be operational with the proposed park. Local groundwater is not expected to pose a risk to park users due to the lack of direct exposure pathways. Mitigation measures include the periodic sampling of monitoring wells associated with the closed landfill, in accordance with applicable permit requirements, as this data can facilitate the identification and correction of potential problems associated with the environmental control infrastructure associated with the landfill.
- Surface water: the proposed roads would entail limited possible uses and potential public health exposures associated with surface water use. As stated above, surface waters in the vicinity of the proposed project are neither designated for use as potable waters nor are they expected to be used in that way for the foreseeable future. In addition, no proposed use

assumes use of the surface water for irrigation. The proposed project would not result in an exposure pathway related to surface water.

- **Sediments:** Sediments are another potential public health risk in that they serve as sinks for many environmentally persistent contaminants including PCBs, pesticides, toxic metals, and other anthropogenic pollutants. Measures to avoid public health impacts from sediments include design and management elements that would limit potential interactions between sediments and users with the proposed project. For example, no major dredging projects are proposed with the road projects.
- **Site testing:** Site testing for off-mound road segments is recommended as capital projects move forward and individual capital projects would develop a testing program based on areas where soil/ground water disturbance may be proposed. Based on site-specific project designs and individual testing protocols, remediation, if necessary, may be proposed to avoid impacts.
- **Soils:** The park development process envisions use of soils that meet the various criteria contained in 6 NYCRR Part 375 standards appropriate to the specific capital park project and program elements for the proposed project. Soils imported to the park and used for grading and near-surface placement also be analyzed to verify that they meet the criteria for the park which could be developed on a case by case basis using Park 375 as a guide (see also the discussion above under “Project Description”).

For the reasons stated above, it is not expected that the proposed project would result in any public health impacts.

## **C. ALTERNATIVES TO THE PROPOSED PROJECT**

This EIS considers the following alternatives:

- The No Action Alternative, which assumes no park roads in East Park;
- Alternative Phasing—Four Lane Road (Reconstructed Final Cover Without 2011 Embankment Construction);
- Alternative Phasing—Four Lane Road (Reconstructed Final Cover With Two Lane 2011 Embankment Construction);
- Alternative Alignment: Richmond Hill Road Connection (West of Landfill Section 6/7);
- Alternative Alignment: East Park Loop Road Modified Proposal;
- An East Park Loop Park Road—One-Lane Road; and
- Limited Action Alternative.

A summary of the impacts under these alternatives follows.

### **NO ACTION ALTERNATIVE**

The No Action Alternative assumes that the proposed East Park roads are not implemented. This alternative essentially reflects conditions discussed as the “Future Without the Proposed Project” in Chapters 2 through 21 through the analysis years 2011, 2016 and 2036. This analysis compares conditions under the No Action Alternative to conditions with the proposed project through 2036.

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With the No Action Alternative, there would be no delay in the closure of Landfill Section 6/7. There would also be no need to avoid, minimize or mitigate impacts; however, with the proposed project these measures can eliminate project impacts. What the No Action Alternative would not achieve are the project's goals and objective with respect to improving local traffic circulation, providing connectivity across Fresh Kills Landfill, and minimizing the impacts of the proposed project on local streets.

Similar to the proposed project, the No Action Alternative would not result in significant adverse impacts on land use, zoning, and public policy; socioeconomic conditions; community facilities; open space; shadows; historic resources; urban design and visual resources; neighborhood character; natural resources; waterfront revitalization program; infrastructure; solid waste and sanitation services; energy; transit and pedestrians; air quality, noise; construction; and public health.

In addition, like the proposed project, this alternative would not have any impacts on odors or air emissions either during construction or operation. Likewise, there would not be any impacts on the production of leachate nor would there be hazards for landfill slope stability. Nor would there be any changes in runoff patterns at the site or the hydrology of the current DSNY systems. With the proposed project there are changes in landfill hydrology; however it is expected that the proposed project could address these stormwater management issues without any adverse impacts to the landfill or upstream or downstream locations and without any water quality impacts. There would also not be any filling of wetlands under this alternative; while these impacts occur with the proposed project they can be addressed through a comprehensive restoration and wetlands mitigation program. Lastly, under this alternative, there would not be any impacts related to habitat fragmentation. With the proposed project these impacts would need to be addressed through road design, particularly with the Yukon Avenue and Forest Hill Road Connections.

Under this alternative, the benefits to local neighborhood character that are expected to result from the proposed action—including new road access across Fresh Kills with access to the West Shore Expressway and the proposed park and diverted traffic from local neighborhoods—would not be realized. This alternative would also not attain the stated project or City goals (e.g., the Staten Island Transportation Task Force) to improve traffic conditions in western Staten Island. This alternative would also not implement the goals and plans of the City and the Office of the Staten Island Borough President to provide public road access across Fresh Kills.

### **ALTERNATIVE PHASING –FOUR-LANE ROAD (RECONSTRUCTED FINAL COVER WITHOUT 2011 ROAD EMBANKMENT)**

This section analyzes the potential environmental impacts of an alternative phasing in which the currently approved closure design proceeds without the proposed road embankments and assumes any work required for future East Park Road access and connections would therefore need to be implemented following completed closure of Landfill Section 6/7.

The approved final cover system for Section 6/7 is described in the report entitled Fresh Kills Landfill, Section 6/7 Final Cover Design Report, dated January 2001 by Malcolm Pirnie, Inc. (Pirnie Report). The City has proposed the Landfill Section 6/7 Final Cover Design Report, Addendum 1 as an alternate closure design that would coordinate the current closure construction with the proposed road embankments across the landfill, allowing for the possibility of connection to park programs and the West Shore Expressway. This proposed cover plan includes the following:

- Surcharge fill placement and removal;
- Waste relocation as necessary to establish base grades within the road corridors;
- Modification to the landfill gas collection wells and header piping in the vicinity of the road corridors;
- Modification to the stormwater management system to allow stormwater to flow across the road corridors to existing basins B2, C1 (north and south) and R; and
- Installation of final cover.

As stated above, the alternative phasing option involves the closure of Landfill Section 6/7 under the currently approved closure design without coordinating the work with the proposed road embankment. Therefore, under this alternative, all previously completed final closure work within the proposed Yukon Avenue and Forest Hill Road Connection alignments, including geosynthetic cap materials, cover soils, landfill gas piping, and stormwater management features, would need to be removed and modified in order to implement proposed road modifications at a later date. As a result, this alternative phasing would increase the consumption of nonrenewable resources (petroleum and construction materials), and create additional waste and air emissions associated with construction activities as compared to constructing the proposed embankment in coordination with the closure construction of Landfill Section 6/7.

With this alternative phasing, there would be no delay in the closure of Landfill Section 6/7. However, it is assumed that at some future date given the local need for solutions to traffic congestion, the obstacle presented by Fresh Kills Park, and the need for vehicular access into the proposed park, the landfill cover then would need to be redesigned and reconstructed. Like the proposed project, under this alternative there would also be a need to avoid, minimize or mitigate impacts from the proposed roads. As with the proposed project, it is expected these measures could eliminate project impacts, although for the landfill crossing segment these mitigative measures would be more costly since they would have to be retrofitted into the already installed cover system. This alternative would achieve the project's goals and objectives with respect to improving local traffic circulation, providing connectivity across Fresh Kills Landfill, and minimizing the impacts of the proposed Fresh Kills Park project on local streets; however, with this alternative there would be a greater delay for implementation given the additional design, construction activities, and cost.

Like the proposed project, with the appropriate protection measures, this alternative would not impact odors or landfill air emissions either during construction or operation, although the techniques to implement such measures under a retrofit are expected to be more complicated and costly since they would not be performed simultaneously with the current landfill closure. Likewise, with the appropriate construction period protection measures, there would not be any impacts on the production of leachate nor would there be hazards for landfill slope stability. With the proposed project, as under this alternative, there would be changes in hydrology due to road runoff and modifications to the Landfill Section 6/7 stormwater management basins; however under this alternative, like the proposed project, the stormwater management issues could be addressed without any adverse impacts to the landfill system hydrology or local water quality.

Based on the analysis in this SEIS, this alternative phasing would result in the generation of at least 900 tons of non-recyclable waste materials, add over 25,000 truck trips on local roads for delivery of equipment and materials, and result in the consumption of over 217,000 gallons of

diesel fuel for transportation and construction. It can therefore be concluded that the alternative phasing option would result in avoidable impacts to air quality and road congestion.

**ALTERNATIVE PHASING—FOUR LANE ROAD (RECONSTRUCTED FINAL COVER WITH TWO LANE 2011 EMBANKMENT)**

This alternative is similar to the one presented above; however, this alternative assumes that the landfill cover is modified at this time for a two-lane road embankment only and would need to be widened to a four-lane road at a later date. This assumes, for example, that once the Yukon Avenue Connection is operating as a two-lane road that demand exceeds capacity and a widening to four lanes is necessary.

The differences between constructing the landfill embankment at this time to accommodate a four-lane park road as compared to a two-lane road are quite limited. For example, the estimated volume of cut necessary to provide the road embankment is only 39,645 cubic yards less for a two-lane road than for a four-lane road embankment. This reduction is primarily due to reducing the limits of grading on the east-facing side of the landfill. The estimated volume of cut necessary to provide the two lane road embankment for the Forest Hill Road Connection would be reduced by an estimated 17,000 cubic yards, which is even less significant than that for the Yukon Avenue Connection.

The number of impacted gas wells would also be reduced from four to three along the Forest Hill Road Connection if the two-lane option were selected, which is also not a significant change. Along the Forest Hill Road Connection, the impacted gas headers and lateral pipes, and stormwater management features, would not change regardless of the option selected. On the Yukon Avenue Connection, the impacted gas wells, gas header line, and stormwater features, firewater line and overhead electric lines would be the same.

Assuming that at a later date the two-lane road would need to be widened to a four lane road, but that the final cover installed at this time cannot accommodate that widening, this alternative phasing would have significant impacts similar to that discussed above for the four-lane road reconstruction alternative. These are significant adverse impacts that can be avoided through the implementation of the road embankment as part of the Landfill Section 6/7 final cover construction. Added material that would need to be moved at a later date under this alternative would result in the generation of about 500 tons of non-recyclable waste materials, about 12,500 truck trips for delivery of equipment and materials, and the consumption of over 217,000 gallons of diesel fuel for transportation and construction at a later date. It would also cause major traffic disruptions on operational roads to the degree that such a retrofitting would be highly impractical at a later date. It is therefore concluded that the alternative phasing option could result in impacts to air quality and road congestion along with neighborhood character impacts for Staten Island residents.

**ALTERNATIVE ALIGNMENT: RICHMOND HILL ROAD CONNECTION (WEST OF LANDFILL SECTION 6/7)**

This alternative examines the potential impacts of a roadway alignment for the Richmond Hill Road Connection that extends around the west side of Landfill Section 6/7 rather than the two-lane and four-lane options that head south along the Richmond Avenue berm from the Richmond Hill Road/Richmond Avenue intersection, crossing the stormwater basins and wetlands, and passing over the landfill via the Yukon Connection. As described in greater detail below, three specific alignments were examined: (1) an off-landfill alignment (outside the solid

waste management unit area boundary); (2) on the existing landfill service road<sup>1</sup>; and (3) along at a higher elevation on Landfill Section 6/7. This alternative road alignment would have similar traffic to the proposed project since it is also assumed the three Yukon Avenue Connections are provided, including traffic conditions at the intersection of Richmond Hill Road at Richmond Avenue. However, there are specific differences with respect to road geometry, landfill conflicts, environmental impacts, and park conflicts that are described below.

Like the proposed project there would also be a need to avoid, minimize or mitigate impacts from the proposed roads, although the need for mitigation would extend to the tidal wetlands northwest of Landfill Section 6/7 under the “off-landfill” alignment (i.e., the wetlands along Main Creek). As with the proposed project, it is expected that these wetland impacts could be mitigated. This alternative would similarly achieve the project’s goals and objectives with respect to improving local traffic circulation, providing connectivity across Fresh Kills Landfill, and minimizing the impacts of the proposed Fresh Kills Park project on local streets.

Like the proposed project this alternative would not be expected to have any impacts on odors or air emissions either during construction or operation. In addition, with the appropriate construction period protection measures, there would not be any impacts on the production of leachate nor would there be hazards for landfill slope stability.

#### **ALTERNATIVE ALIGNMENT: EAST PARK LOOP ROAD MODIFIED PROPOSAL<sup>2</sup>**

Based on a design review of the proposed East Park Loop Road option, a modified alignment was developed that proposes an alternative alignment which reduces the number of nonstandard features for the 35 mph design speed, while still maintaining the design intent of that option, where feasible. This alternative also includes recommendations that minimize and/or mitigate impacts and conflicts with landfill features.

For instance, this modified alternative includes a revised horizontal alignment which accounts for the typical roadway sections and eliminates some of the nonstandard curve radii and horizontal stopping sight distances identified in the analysis of this alternative. The maximum safe operating speed is reduced to less than 35 mph at approaches to intersections at multiple locations. The roadway alignment presented in this modified alternative does not conflict with any drip leg vaults as does the above-described alternative.

This modified alternative recommends a revised vertical alignment which coincides with the revised horizontal alignment. The vertical profile is improved from existing conditions, however there are nonstandard and undesirable features which remain in this alternative. There are 34 locations where longitudinal grades are less than the desirable minimum of 0.50 percent. Existing vertical grade breaks remain at many locations. While these breaks are in accordance with the 4.0 percent maximum per DDC standards, they exceed the AASHTO maximum grade break criteria of 0.62 percent at 59 locations. Vertical curves are provided where possible to

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<sup>1</sup> This landfill service road alignment was presented in the *Fresh Kills Park FGEIS* (March 2009) based on designs presented in the URS report (February 2009) and was analyzed in greater detail in this SEIS as a park road option, the East Park Loop Road.

<sup>2</sup> This alternative was presented in the *Fresh Kills Landfill Evaluation of Roadway Alternative in East Park Draft Report*, prepared by URS Corporation for the New York City Department of Design and Construction (February 2009). It is a modification of the alternative submitted by the SIBPO as part of the DGEIS comments.

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smooth out alignment transitions. There are four vertical curve locations which have nonstandard stopping sight distance or headlight sight distance.

This modified alternative also proposes a number of solutions to eliminate adverse and nonstandard drainage conditions which exist in the East Park Loop Road option. In the northern section of the loop, riprap stormwater collection points or shallow inlets are provided every 50 feet behind gabion walls, with 8 inch outletting drains beneath the roadway. This alternative would have the capacity to completely drain surface runoff at all locations.

In the southern section of East Park Loop Roads, where landfill capping has not been completed, drainage options include installation of a perforated underdrain along the top of the landfill cap with 4-inch HDPE outlets to the roadway pavement at either a gabion wall or riprap ditch spaced every 150 feet. These alternatives, however, would not have the capacity to drain the entire road, and would not direct all runoff away from the road surface. However, another alternative involves installation of a three-foot riprap strip adjacent to the shoulder and allowing it to percolate into a subsurface crushed-stone trench with eight-inch outlet pipes spaced every 100 feet on center. Outlet pipes would discharge on the opposite side of the road. This alternative would provide adequate capacity to completely drain surface runoff in all parts of the southern section for the 10-year design storm, and is recommended for locations with relatively large drainage areas.

There are maintenance concerns regarding the underdrain systems. If underdrain systems were to become clogged, the roadway drainage would be compromised. These systems would have to be designed with maintenance of utmost importance to reduce the potential for icing and hydroplaning.

Otherwise, impacts under this alternative with respect to landfill infrastructure, minimizing, avoiding and mitigating environmental impacts, addressing the traffic need; odors and air emissions; production of leachate; hazards for landfill slope stability; generation of runoff; adverse impacts on wetlands and wildlife; and habitat fragmentation would be similar to the East Park Loop Road option analyzed in this SEIS. Overall, however, this modified design would have less of a potential for impacts on landfill infrastructure.

This alternative would impact slightly more acres of Main Creek wetlands than the East Park Loop Road option. It is noted that the wetlands impacted by this alternative might be considered higher-value resources than those impacted by the proposed project, since these are more naturally occurring wetlands west of Landfill 6/7. This alternative may also increase the amount of road within the 100-year flood plain.

### **EAST PARK LOOP ROAD—ONE-LANE ROAD**

This modified alternative alignment was developed with a revised conceptual design that is identical in alignment to the East Park Loop Road option, the exception being that a single-lane loop road is proposed around Landfill 6/7, rather than the two-lane loop road. This alternative has been included to determine if there are lesser impacts to wetlands and effects on DSNY's maintenance of leachate pump stations.

This alternative alignment retains some of the nonstandard roadway features identified in the East Park Loop Road alignment, with respect to horizontal curvature, superelevation, sight distances, and undesirable vertical profile. Stormwater runoff from Landfill Section 6/7 would also be directed across the road surface with no provisions for subsurface drainage.

Impacts under this alternative with respect to landfill closure delays, minimizing, avoiding and mitigating environmental impacts, addressing the traffic need; odors and air emissions; production of leachate; hazards for landfill slope stability; generation of runoff; adverse impacts on wetlands and wildlife; and habitat fragmentation would be similar to the East Park Loop Road option. However, with the narrower roadway, it would have less of a potential for impacts on landfill infrastructure and wetlands.

While the East Park Loop Road option would require the temporary closure of the right lane of the roadway during DSNY leachate pump station maintenance operations, this alternative would allow maintenance and access in a widened right shoulder of the roadway. Installation of a traffic signalization system for the right lane closure would not be required.

For this alternative, differential settlement between the pavement of the existing service road and the widened portion outside of the service road may be less of a concern, since the joint between existing and new pavement would be located in the right shoulder of the roadway rather than at moving travel lanes.

This alternative would be expected to directly impact somewhat fewer acres of wetlands than the East Park Loop Road option and fewer wetland acres than the four-lane and two-lane road options. It is, however, noted that the wetlands impacted by this alternative might be considered higher-value resources than those impacted by the options, since they are located in more naturally occurring tidal wetlands along Main Creek.

#### **LIMITED ACTION ALTERNATIVE**

This alternative examines the potential impacts of using East Park for a recreational purpose only and without the construction of the proposed East Park roads. It is included in response to the comments received from DEC. In this alternative the proposed road embankment would therefore be used only for two informal trails across the landfill that would connect on the east and west with the proposed multi-purpose loop road around the base of the Landfill Section 6/7. There would also be parking proposed at the western trail heads, near the Confluence Loop Park Road.

As compared with the proposed project, the Limited Action Alternative would require a similar delay in the closure of Landfill Section 6/7 since the landfill closure would be modified, although it would not provide the proposed roads. Therefore, unlike the proposed project, there would be no need to avoid, minimize or mitigate impacts from construction of the roads off the landfill (e.g., wetland and aquatic resources impacts along the Forest Hill Road and Richmond Hill Road Connections). However, with the proposed project these measures can mitigate project impacts. What the Limited Action Alternative would not achieve are the project's goals and objective with respect to improving local traffic circulation, providing connectivity across Fresh Kills Landfill, and minimizing the impacts of the proposed Fresh Kills Park project on local streets. Rather, it would only provide more trail connections across the park.

Like the proposed project this alternative would not have any impacts on odors or air emissions either during construction or operation. Likewise, there would not be any impacts on the production of leachate nor would there be hazards for landfill slope stability. Unlike the proposed project, there would not be any changes in runoff patterns at the site or the hydrology of the current DSNY systems. With the proposed project there are changes in landfill hydrology due to the proposed roads; however it is expected that the proposed project could address these stormwater management issues without any adverse impacts to the landfill or upstream or downstream locations, and without any water quality impacts. There would also not be any

filling of wetlands under this alternative. While these impacts occur with the proposed project, they can be addressed through a comprehensive restoration and wetlands mitigation program. Lastly, under this alternative, there would not be any impacts related to habitat fragmentation from the proposed roads. With the proposed project, these impacts would need to be addressed through more detailed road design, particularly with the Yukon Avenue, Forest Hill Road, and Richmond Hill Road Connections.

#### **D. IMPACT AVOIDANCE MEASURES AND MITIGATION**

In keeping with the objectives of CEQR and SEORA, the proposed project has been designed to minimize impacts on the environment. Thus, in many technical areas the proposed project has built into the project measures that avoid significant impacts. These measures are described in the various chapters of the EIS and are summarized below. Where significant impacts have been identified that go beyond these measures, or where mitigation requires the approval of other agencies, such as the New York City Landmarks Preservation Commission (LPC), tidal wetlands mitigation from DEC or traffic mitigation measures that need to be coordinated with NYCDOT, in accordance with the *CEQR Technical Manual*, these mitigation measures are presented below. Technical areas that require no impact avoidance measures or mitigation include socioeconomic conditions, community facilities, open space, shadows, air quality and noise.

#### **IMPACT AVOIDANCE MEASURES**

- Landfill Protections. Considering that the proposed project in the 2016 and 2036 analysis years would provide the public roads and therefore open the public opportunity to approach landfill infrastructure, including surface features associated with the leachate management system, the landfill gas management system and the stormwater management system, and that public park road development may create new loading conditions on the subsurface landfill infrastructure, a number of preliminary measures are presented in this SEIS as techniques that could avoid impacts to landfill infrastructure and any associated impacts on public health or the environment. It is recognized that many of these mitigation measures result from the public access that would be created within East Park due to the 2016 and 2036 road phases. Therefore, the measures presented below would not apply to the 2011 analysis condition where only the modified final cover design and road embankment is implemented because no additional public access is provided. In addition, the measures presented below would be subject to further refinement and design review by DSNY and approval by DEC as part of a more detailed design of the proposed park roads.
- Natural Resources. There are a number of elements of the project that could be proposed to avoid impacts on natural resources. These include measures to minimize the impacts of nighttime lighting on wildlife activity, as well as measures to minimize habitat fragmentation such as ensuring a well-designed circulation network.
- Infrastructure. The proposed project does not require any impact avoidance measures for water supply as no impacts are anticipated, although the Fresh Kills Park project does include sustainability strategies to reduce water demand. In addition, to avoid stormwater impacts from increases in impervious surfaces and to protect receiving waters, individual stormwater Best Management Practices (BMPs) would be used to enhance proposed park features, and provide water quality treatment and quantity management, particularly for the road runoff. Multi-functional source control BMPs such as bioretention and pocket wetlands

that not only provide water quality treatment of stormwater runoff, but also provide aesthetic and natural resource benefits, would be used.

- Traffic and Parking. The proposed project is a long-term implementation project with multiple phases. It would have future capital projects that would require coordination with NYCDOT including curb cuts to provide access to Richmond Avenue. To avoid future traffic impacts and to ensure proper traffic patterns and intersection designs are implemented, DPR will continue to coordinate with NYCDOT and NYSDOT as capital projects move forward, in design and implementation.

In addition, since the proposed project includes a major road improvement project that would affect circulation patterns in this area of Staten Island, DPR (Fresh Kills Park) would also actively participate in the Staten Island Task Force which has been created to address traffic issues on Staten Island.

Given the long term nature of the development of Fresh Kills Park and the current conceptual level of design for much of the park, additional traffic analysis will be necessary over the course of the project as individual areas of the park and roadway system are advanced. As the project progresses and the park roads are constructed, DPR will continue to monitor the traffic conditions and seek ways of improving traffic flow in and around the Fresh Kills site.

- Transit and Pedestrians. The proposed project is seeking to provide alternative modes of travel to the project site for the purpose of reducing vehicle trips (now assumed to be the predominant mode) and to reduce traffic impacts, and enhance the park experience. In addition, design of the proposed pedestrian/bicycle crossings along the proposed park roads would take into account the safety factors such as the crossing location in order to avoid conflicts with vehicles. These measures would be determined during more advanced road design.
- Construction. Measures to avoid impacts during construction would include:
  - Coordinate with DSNY Closure Activities at Landfill Sections 6/7;
  - Pre-construction contractor education and training that addresses protecting and avoiding impacts to landfill infrastructures for contractors;
  - Flagging or marking of infrastructure;
  - Posting of signs, such as “Buried Utility” or “Overhead Lines;”
  - Review of construction procedures to identify whether alternative, less disruptive construction techniques, are applicable to a given activity;
  - For critical landfill infrastructure, trained personnel would observe the construction activities and potentially affected infrastructure; and
  - Record observations of the construction activities and any monitoring results.
  - Prepare staging plans that place construction activities internal to the project site for the larger projects thereby minimizing impacts on local neighborhoods and roads at the periphery;
  - Site individual capital project staging areas in areas that were previously disturbed or that would be disturbed as part of project development and thereby avoiding impacts to wetlands and natural features;
  - Locate road construction staging areas in the proposed road corridor, clear of wetlands and landfill infrastructure;

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- Use existing truck access routes for construction since these allow for direct access to and from the regional highway while internalizing truck traffic and minimizing the use of neighborhood streets around the project site;
- Protect wetlands and natural resources through flagging and signage to protect areas adjacent to construction activities;
- Undertake landscape enhancement during periods that would not conflict with existing wildlife and avian species use of the site;
- Perform field inspections and provide barriers to protect rare and endangered species and their landscapes or nesting areas during the construction period;
- Use best management strategies to control soil erosion and sedimentation including implementing site specific stormwater pollution prevention plans for each capital project (see the discussion below);
- Incorporate enhancement measures that would minimize disturbance and removal of desirable existing native vegetation where possible;
- Minimize the closing of existing streets by performing nighttime work along major corridors (e.g., to implement modifications at the two intersections with Richmond Avenue, at Richmond Hill and Forest Hill Roads, and the connecting ramps to the West Shore Expressway);
- Control worker access to the site by stipulating entry and exit points within each contract; and
- Provide for all necessary construction worker parking on-site.
- Develop a “Conceptual Site-Wide Erosion and Sediment Control Plan” (for 2016 and 2036) to establish the guidelines by which each phase of project construction, through implementation of the proposed techniques, would avoid impacts to natural features and in-place stormwater management systems. (The 2011 soil erosion and sediment control program is discussed in the Landfill Section 6/7 Final Cover Design Report, Addendum 1.)
- Use strategies to limit wildlife impacts as a result of construction activities such as physical barriers at construction and staging areas, limiting the speed of construction vehicles, and avoiding nighttime construction operations.
- Prepare a natural resources protection plan for each construction project. This plan would have a pre-construction walkthrough to identify sensitive landscapes, trees, sensitive plant communities such as wetlands, and any other communities that have been identified for preservation and protection under the proposed project and would establish the necessary protection zones around these resources to minimize the potential for adverse direct or indirect impacts to these resources.
- Perform construction monitoring to document that construction is consistent with the design and intent including protection of the environmental protection and monitoring systems at the Fresh Kills Landfill (i.e., landfill final cover, landfill gas, and leachate management systems) and to ensure that those systems remain intact and functioning during and after construction activities.
- Implement measures to minimize impacts to natural resources from the construction of road viaducts and culverts.
- Secure all the regulatory approvals from DEC and NYCDEP and take all the steps for environmental control and protection in order to ensure that local waterways are not adversely impacted by dewatering activities.

- For site-specific capital project areas where soil and/or groundwater disturbance is proposed, individual project-specific subsurface investigations and, if necessary, remediation, would be undertaken in accordance with additional site research (e.g., aerial photos, database searches) that may be necessary at the time of construction in order to supplement the conclusions presented in this EIS, along with the necessary individual project site investigations and testing programs.
- Implement a Construction Health and Safety Plan during construction for 2016 and 2036 (a plan is already in place for the 2011 landfill closure).
- Minimize solid waste during construction by recycling cut trees and vegetation for use as park mulch and by implementing the City's program to reduce solid waste generated by construction sites.
- Maximize the use of the regional highway access provided by the West Shore Expressway as well as to use the existing landfill service roads that are internal to the site for the purposes of delivering soils and construction equipment to minimize traffic impacts on the local neighborhood during construction. In addition, all construction worker parking would be provided on site.
- Reduce short-term impacts of the proposed project on air quality through diesel equipment reduction; the use of clean fuel; the use of newer equipment; locating large emissions sources and activities, such as concrete trucks and pumps, away from residential buildings, schools, and playgrounds; implementing measures to prevent fugitive dust from becoming airborne. In addition, idling of trucks or other equipment would not be permitted during periods when the trucks are being unloaded or are not in use.
- Implement noise reduction measures that would ensure compliance with the new Noise Control Code (effective July 1, 2007).
- Implement nuisance, vector management, litter and debris, and dust controls.

## MITIGATION MEASURES

The measures below are presented as mitigation measures as they require additional regulatory approvals or are outside the jurisdiction of DPR to implement. Specific mitigation measures will be developed as individual capital projects progress.

### *EROSION AND SEDIMENTATION (2011 CONSTRUCTION PERIOD)*

With the proposed modified cover plan, there are projected increases in pollutant loading that are a worst case condition in that it assumes the installation of full width road embankment material (i.e., 60 feet wide) across Landfill Section 6/7. It was determined that the proposed project could provide a minimum 15-foot-wide interim gravel road across Landfill Section 6/7 along the proposed Forest Hill Road and Yukon Avenue Connection corridors—rather than the 60-foot-wide corridor assumed in the DSEIS—by minimizing the road and width and providing a planted cover over the balance of the corridor. The results of the water quality analysis for this condition have disclosed that with these measures in place, the proposed project would not impact water quality in the 2011 condition.

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### *ARCHAEOLOGICAL RESOURCES (2036)*

A Phase 1A study prepared for this project concluded that portions of the project site are sensitive for pre-contact and historic period archaeological resources. As project design progresses, it is recommended that individual construction projects be reviewed by an archaeologist to determine if the project could impact any archaeologically sensitive areas identified in the Phase 1A. If it is determined that impacts are possible, further investigation such as Phase 1B archaeological testing would be necessary to identify the presence or absence of archaeological resources.

### *NATURAL RESOURCES (2016 AND 2036)*

#### *Introduction*

The Fresh Kills Park Plan intends to protect and enhance the condition and value of the wetland systems currently present and the proposed future conditions, while offsetting the adverse impacts to wetlands resulting from the construction of park roads and bridges. The proposed East Park roads would have impacts on wetlands only in the later phase with the completion of the East Park road system. (No direct impacts to wetlands would occur in the 2011 or 2016 phases.) This include activities that would impact wetlands as either direct impacts (e.g., filling a portion of the wetlands for the Richmond Hill Road Connection), or indirectly (e.g., shading from the Forest Hill Road connection viaduct, changes in hydrology, habitat fragmentation).

Overall, the Fresh Kills Park project and the East Park elements are proposed to include substantial wetland and upland enhancement projects for the purposes of improving the overall ecological values of the project site. These include extensive wetland improvement projects that call for enhancement of tidal wetlands (i.e., *Spartina* and mixed-marsh enhancement along tidal creeks), freshwater wetland expansion and enhancement (i.e., palustrine scrub shrub and forested wetlands) and possible freshwater wetland creation (i.e., conversion of detention basins to wetland features).

There are numerous wetland mitigation opportunities at Fresh Kills Park. Therefore, as design moves forward, the selected long-term East Park road options can include a number of mitigation strategies that are tailored to the impacts and mitigation opportunities specific to that option. In no case would there be any remaining unavoidable or unmitigated adverse wetland impacts from the proposed roads. Provided below is a discussion of potential mitigation strategies and opportunities.

In addition, the proposed project would include impact avoidance strategies such as those proposed with the Yukon Avenue Connection in order to avoid habitat fragmentation impacts. For the impact avoidance measures at the Yukon Avenue Connection, this includes an oversized culverts with natural substrate bottom that would provide not only a hydrological connection, but an ecological connection for reptiles, amphibians, and avifauna that may use the wetlands east of Landfill Section 6/7.

Additional mitigation measures for impacts to wetland and aquatic resources habitats are summarized below.

*IMPACT AVOIDANCE AND MITIGATION STRATEGIES*

*Introduction*

A number of potential habitat restoration and enhancement alternatives have been developed to demonstrate feasible and implementable mitigation for these impacts. Project impacts are related to shading or fill for park roads that need to cross wetlands. The proposed mitigation strategies, discussed below, seek to replace those wetland functions that would be lost due to the project impacts, and are sited in areas of the proposed project that are located near the impact zones.

*Mitigation Options within East Park*

- **Living Shoreline Creation:** In areas around the East Park DSNY drainage basins, and within other areas where steep slopes that transition to aquatic habitats prevent a sustainable shoreline habitat, the potential exists to create gentler slopes that not only provide erosion control benefits, but also enhance the natural shoreline habitat and buffer areas. As roads are improved to provide better connections through Fresh Kills Park, these shoreline areas can be enhanced to allow for natural processes to evolve through the strategic placement of plants, stone, or sand fill material and other structural and organic materials. Such enhancements may increase overall fill of these areas slightly, but could substantially improve habitat functions substantially. In addition, the replacement of the existing marginal soils with sandier soils will aid in managing invasive species (which prefer more nutrient-enriched soils). This mitigation alternative can be used to mitigate for impacts related to the placement of additional roadside fill around the site in tidal, freshwater wetland and aquatic habitats.
- **Aquatic Habitat Enhancement:** It is assumed that the hydrology of the DSNY basins in East Park will change as Landfill Section 6/7 experiences final closure and the park roads are developed. One likely long-term result is that the basins will be drier and subject to less frequent flooding. Therefore, to enhance the remaining aquatic zones, a number of measures could be taken. For example, as water levels potentially decrease within the basins, excess storage capacity could be converted to wetland and riparian habitat (meadow and scrub-shrub) with natural vegetation through the strategic placement of sandy soils. Interior open water areas could be created and maintained to support waterfowl and wading bird use, and in some instances could be enhanced with the establishment of freshwater submerged or floating leaved aquatic vegetation. This mitigation alternative could be used to mitigate for impacts related to the filling of the basins.
- **Stream Enhancement:** Where stream connections will continue to exist, stream channel improvements can be undertaken to mitigate for those to be impacted by the proposed road system. Stream enhancements could include the management of invasive plant species and provision of additional buffer areas planted with natural vegetation. There is also the potential to integrate stream enhancements with larger-scale regenerative stormwater conveyance projects.
- **Freshwater Wetland Restoration and Enhancement:** In the southeastern area of the Landfill Section 6/7, adjacent to Basin R, some of the flow currently directed to Basin R could be split off to create small freshwater wetland areas and natural buffer zones. The dimensions of the freshwater area would be dependent on the ultimate proposed roadway alignment as well as the results of water budget and hydrology analysis. This freshwater wetland creation could be appropriate as mitigation for some of the freshwater impacts that may occur in other areas along the eastern edge of the site.

- **Native Grassland Meadows and Scrub-Shrub Habitat Creation:** In transition areas between new roads and wetland and aquatic habitats, the mitigation focus would be on the creation of native grassland meadows and scrub-shrub habitat through the use of sandy soils, where structurally practicable. These created habitats can provide an overall ecological context for park users, while protecting sensitive habitat from new and more-heavily used roads. Early investments in good soils, matched to the proposed plant community, can provide long term benefits. Native plant species of local origin, effective erosion and sediment controls, and matching the vegetation with the evolving site conditions will not only make for a more successful park, but will also minimize the post planting care and management.

*Mitigation Options outside of East Park*

- **Tidal Wetland and Forested Habitat Community Reconnection:** A significant opportunity exists to restore or enhance the tidal inlet channel that occurs between the two landfill sections in South Park. This restoration could be used to mitigate the impacts to the forested-wetlands located in the southeast (Forest Hill Road Connection) and northeast (Richmond Hill Road Connection) portions of East Park.
- **Stream Enhancement in South Park:** The existing swale that currently serves to drain areas in the southern part of South Park, both north and south of the existing service road, could be enhanced to create an improved visual experience while also improving overall water quality and stormwater management. This channel is a human-altered system influenced by ditching, road construction and historic landfill operations. The proposed approach to naturalize this swale would be to place natural materials such as rock, tree logs, root wads, and native plantings in strategic locations and allow natural channel design processes and stream geomorphology to slowly assist the channel to adapt to a more natural configuration. Minor manipulations along the stream edges to create small meanders would enhance the system. This stream enhancement could serve to mitigate the stream impacts that are proposed to occur along the east side of East Park.

*TRAFFIC (2016 AND 2036)*

A number of intersections in the study area would experience significant traffic impacts as a result of vehicular traffic generated by the proposed project in the 2016 and 2036 analysis years (no traffic mitigation is necessary for the 2011 analysis year). Descriptions of that mitigation are provided below. DPR also recognizes that ongoing coordination with NYCDOT will be necessary to ensure that all mitigation can be implemented at the time of construction and that the benefits of the proposed East Park roads are maximized while the project impacts are minimized. For these reasons, DPR will continue to coordinate with NYCDOT and NYSDOT in the implementation of all East Park roads design and mitigation.

*2016 Analysis*

Four (4) out of the five (5) analyzed intersections would be impacted under the 2016 Build Conditions, as follows.

- **Richmond Hill Road and Forest Hill Road.** The impacts at the westbound approach and the northbound shared through- and right-turn movement at this intersection during the weekday AM peak hour could be mitigated by developing a new signal phasing and timing plan.

The impacts at the westbound approach, northbound shared through- and right-turn movement and southbound shared through- and right-turn movement during the weekday midday, weekday PM and weekend midday and PM peak hours could not be mitigated by standard traffic engineering measures.

- **Richmond Hill Road and Richmond Avenue.** The impact at the southbound left-turn movement at this intersection during the weekday AM, weekday midday, weekday PM, and weekend PM could be mitigated by shifting 1 second of green time from the northbound/southbound phase to the northbound/southbound protected left-turn phase.

The impacts at the westbound exclusive left-turn and the shared left-turn and through movement and the southbound left-turn movement at this intersection during the weekend midday peak hour could not be mitigated by standard traffic engineering measures.

- **Yukon Avenue and Richmond Avenue.** The impact at the westbound approach during the weekday and weekend midday peak hours could be mitigated by restriping the westbound approach to provide one 12-foot exclusive left-turn lane and one 12-foot shared through- and right-turn lane.

The impact at the southbound shared through- and right-turn movement could be mitigated by restriping the westbound approach to provide one 12-foot exclusive left-turn lane and one 12-foot shared through- and right-turn lane. Daylighting the southbound approach to provide an additional moving lane is also required.

- **Forest Hill Road and Richmond Avenue.** The impact at the northbound right-turn movement during the weekday AM peak hour could be mitigated by shifting 1 second of green time from the westbound phase to the northbound/southbound phase.

With the above mitigation measures in place, the majority of the impacted locations would operate at the same or better service levels than the 2016 No Build conditions.

### 2036 Analysis

Recognizing that there are multiple build condition options, with the three connections proposed along Richmond Avenue, recommended mitigation measures for each roadway option are presented below.

#### *Completed East Park Road System*

Under the 2036 Completed East Park Road Build Conditions, all five (5) analyzed intersections would be impacted under the 2036 Build Conditions, as follows:

- **Richmond Hill Road and Forest Hill Road.** The impacts at the westbound approach, northbound shared through- and right-turn movement and southbound shared through- and right-turn movement during all five analyzed peak hours could not be mitigated by standard traffic engineering measures.
- **Richmond Hill Road and Richmond Avenue.** The impacts at the westbound left-turn, northbound through and southbound shared through- and right-turn movements at this intersection during the weekday midday peak hour could not be mitigated by standard traffic engineering measures.

The impacts at the southbound approach at this intersection during the weekday PM peak hour could not be mitigated by standard traffic engineering measures.

The impacts at the westbound left-turn, northbound through and southbound approach at this intersection during the weekend midday peak hour could not be mitigated by standard traffic engineering measures.

The impacts at the northbound through movement and the southbound shared through- and right-turn movement at this intersection during the weekend PM peak hour could not be mitigated by standard traffic engineering measures.

- **Yukon Avenue and Richmond Avenue.** The impact at the southbound shared through- and right-turn movement at this intersection during the weekday PM peak hour could be mitigated by daylighting the southbound approach to provide an additional moving lane. Restriping the westbound approach to provide one 12-foot left-turn lane and one 12-foot shared through and right-turn lane is also required.

The impacts at the westbound approach and the southbound shared through- and right-turn movement at this intersection during the weekend midday peak hour could be mitigated by daylighting the southbound approach to provide an additional moving lane and by restriping the westbound approach to provide one 12-foot left-turn lane and one 12-foot shared through and right-turn lane. Shifting 2 seconds of green time from the northbound/southbound phase to the eastbound/westbound phase is also required.

- **Forest Hill Road and Richmond Avenue.** The impacts at the westbound left-turn and northbound through and right-turn movements at this intersection during the weekday AM and weekend midday peak hours could not be mitigated by standard traffic engineering measures.

The impacts at the westbound left-turn, northbound through and right-turn and southbound shared through- and right-turn movement at this intersection during the weekday midday, weekday PM, and weekend PM peak hours could not be mitigated by standard traffic engineering measures.

- **Yukon Avenue and Forest Hill Road.** The impact at the northbound approach at this intersection during the five analyzed peak hours could be mitigated by daylighting the northbound approach.

With the above mitigation measures in place, the majority of the impacted locations would operate at the same or better service levels than the 2036 No Build conditions.

*Yukon Avenue Connection Option*

Under the 2036 Yukon Avenue Connection Option Build Conditions, four (4) out of the five (5) analyzed intersections would be impacted, as follows:

- **Richmond Hill Road and Forest Hill Road.** The impacts at the westbound approach, northbound shared through- and right-turn movement and southbound shared through- and right-turn movement during all five analyzed peak hours could not be mitigated by standard traffic engineering measures.
- **Richmond Hill Road and Richmond Avenue.** The impact at the southbound exclusive left-turn movement during the weekday AM peak hour could be mitigated by shifting 1 second of green time from the northbound/southbound phase to the northbound/southbound exclusive left-turn phase.

The impacts at the westbound exclusive left-turn, the westbound shared left-turn and through-movement and the southbound exclusive left-turn movements during the weekday midday peak hour could not be mitigated by standard traffic engineering measures.

The impacts at the westbound exclusive left-turn movement, the westbound shared left-turn and through movement, and the southbound approach during the weekday PM and weekend midday peak hours could not be mitigated by standard traffic engineering measures.

The impacts at the southbound approach during the weekend PM peak hour could not be mitigated by standard traffic engineering measures.

- **Yukon Avenue and Richmond Avenue.** The impacts at the westbound approach and the southbound shared through- and right-turn movement during the weekday midday peak hour could be mitigated by restriping the westbound approach to provide one 12-foot left-turn lane and one 12-foot shared through- and right-turn lane. In addition, daylighting the southbound approach to provide an additional moving lane is also required.

The impacts at the westbound approach and the southbound shared through- and right-turn movement during the weekday PM and weekend midday peak hours could not be mitigated by standard traffic engineering measures.

The impacts at the westbound approach and the southbound shared through- and right-turn movement during the weekend PM peak hour could be mitigated by restriping the westbound approach to provide one 12-foot left-turn lane and one 12-foot shared through- and right-turn lane. In addition, daylighting the southbound approach is also required.

- **Forest Hill Road and Richmond Avenue.** The impact at the northbound right-turn movement during the weekday AM and PM peak hours could be mitigated by shifting 1 second of green time from the westbound phase to the northbound/southbound phase.

The impact at the northbound through movement during the weekend midday peak hour could not be mitigated by standard traffic engineering measures.

With the above mitigation measures in place, the majority of the impacted locations would operate at the same or better service levels than the 2036 No Build conditions.

## E. UNAVOIDABLE SIGNIFICANT IMPACTS

The proposed project would result in significant adverse traffic impacts at a number of study area intersections. As discussed above in Mitigation, traffic mitigation measures would be employed at individual intersections to mitigate the adverse significant traffic impacts. The proposed mitigation measures consist of standard traffic capacity improvement measures such as lane restriping, signal timing modifications and installation of new traffic signals at unsignalized intersections. However, even with these measures in place, some of the study area intersections would not be completely mitigated in the future conditions back to the No Build conditions. It must also be recognized that the proposed East Park Roads would provide a number of vehicular circulation benefits to the community as well. \*