

A. INTRODUCTION

This chapter examines a number of alternatives to the proposed Fresh Kills East Park roads. In accordance with the Final Scope of Work issued in May 2009, this analysis considers the following alternatives:

- The No Action Alternative, which assumes no park roads in East Park;
- Alternative Phasing—Four-Lane Road (Reconstructed Final Cover With No 2011 Road Embankment Construction);
- Alternative Phasing—Four-Lane Road (Reconstructed Final Cover With Two-Lane 2011 Road Embankment Construction);
- Alternative Alignment: Richmond Hill Road Connection (west of Landfill Section 6/7);
- Alternative Alignment: East Park Loop Road Modified Proposal;
- East Park Loop Road Alternative—One-Lane Road; and
- Limited Action Alternative.

In developing these alternatives, it was the objective of DPR to provide in this chapter a full range of alternatives for the proposed project that particularly addressed certain key technical areas, including natural resources (with a focus on wetlands and habitats), potential landfill impacts, (which could have indirect impacts on water resources and public health, for example), traffic and circulation, air quality, and noise. In accordance with New York City Environmental Quality Review (CEQR)/State Environmental Quality Review (SEQR), these impacts are compared with the proposed project and its environmental impacts, as well as the alternatives' ability to meet the project sponsors goals and objectives. To that end, the alternatives evaluated in this chapter included multiple alternatives with respect to road impacts and alignments, and the evaluation and comparison of impacts with the proposed project.

This alternatives analysis first examines the No Action Alternative. This alternative is required under CEQR/SEQR for all environmental impact statements. Under this alternative, it is assumed that the proposed East Park Roads project does not move forward, but that the Fresh Kills Park project does move forward as presented in the FGEIS (March 2009).

The second and third alternatives assume that the final cover is installed under the approved plan and the DPR would need to then retrofit that completed cover to construct roads at a later date.

The fourth alternative, the Alternative Road Alignment (west of Landfill Section 6/7) assumes that the Richmond Hill Road Connection (a 2036 project) is constructed along the west side of Landfill Section 6/7 along a number of potential alignments.

The fifth alternative involves some minor adjustments to the East Park Loop Road option which could potentially reduce impacts to landfill infrastructure. The sixth alternative assumes that the East Park Loop Road can be reduced in width to one lane.

Lastly, this analysis assumes a Limited Action Alternative. That alternative essentially assumes no roads or active recreational facilities in East Park.

B. NO ACTION ALTERNATIVE

DESCRIPTION

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.

OVERVIEW OF IMPACTS

As described in greater detail below, 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 impacts can be mitigated. What the No Action Alternative would not achieve are 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 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 wetland 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 Forest Hill Road Connection. A more detailed analysis of this alternative follows.

LAND USE, ZONING AND PUBLIC POLICY

Under the No Action Alternative, it is assumed that East Park is built in 2016, but not the proposed roads. Closure construction is assumed to be completed by 2011 under the approved plan. This would include the installation and of final cover on the landfill mounds and continuation of all environmental protection and monitoring systems.

There are a number of projects that are expected to take place in the study area under the No Action Alternative. These projects include roadway improvements, commercial, residential and hotel construction, and industrial projects. It is also assumed that the Fresh Kills Park project moves forward under this alternative.

Under this alternative, the benefits to local land use that are expected to result from the proposed action—including new road access across Fresh Kills providing access to the West Shore Expressway and the proposed park—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 Office of the Staten Island Borough President to provide road access across Fresh Kills and would not meet the important park circulation goals. As a result, this alternative would have neighborhood character impacts that would not occur with the proposed project.

SOCIOECONOMIC CONDITIONS

As stated above, under this alternative no road connections from Richmond Avenue to the West Shore Expressway would be developed. Through the 2016 and 2036 analysis years, the study area would see increases in both residential population and employees without the project. Neither the proposed action nor the No Action Alternative would displace populations, employees, or businesses. However, the project's goals of providing new vehicular access that would support existing and future residential neighborhoods and commercial uses near the project site would not be realized under this No Action Alternative. Thus, there would not be the socioeconomic benefits that are realized with the proposed project.

COMMUNITY FACILITIES

Under the No Action Alternative, the proposed roads would not be constructed. Thus the benefits of providing an emergency through-road connection between Richmond Avenue and the West Shore Expressway would be foregone. These benefits are provided with the proposed project.

OPEN SPACE

Under the No Action Alternative, the 2,163-acre Fresh Kills Park would be constructed; however there would not be the added vehicular access provided by the proposed East Park Roads, which, under the proposed project, provide access to the Confluence Loop Park Road and the West Shore Expressway. Therefore, under the No Action Alternative, although open space acreage would be greater and there would not be impacts on open space as there are with the proposed project, the Fresh Kills Park project would be less accessible to park users, vehicles, and public transit.

SHADOWS

In both No Action Alternative and the proposed project, there would not be any shadow impacts with respect to the proposed roads.

HISTORIC RESOURCES

Under the No Action Alternative, it is assumed that the project site would remain part of the East Park and no park road development would occur. Therefore, no potential impacts to archaeological resources would occur. With the proposed project, it is recommended that individual construction projects be reviewed by an archaeologist to determine if the project could impact locations that were identified in the Phase 1A archaeological documentary study (see FGEIS) as possessing moderate, moderate to high, or high sensitivity for pre-contact or historic-period archaeological resources.

In both No Action Alternative and with the proposed project, there would not be any impacts on historic resources with respect to the proposed roads.

URBAN DESIGN AND VISUAL RESOURCES

Under the No Action Alternative, it is assumed that the visual enhancements associated with the construction of the proposed park would occur but the proposed roads would not be created. In contrast, the proposed project would create new block forms and streetscapes fronting on Richmond Avenue. However, given that Richmond Avenue is a heavily traveled throughfare, this is not expected to be a significant impact of the proposed project with respect to visual character.

NEIGHBORHOOD CHARACTER

The No Action Alternative would not provide the benefits to the neighborhood associated with the proposed project, namely the improved vehicular circulation and removal of Fresh Kills as an impediment to neighborhood circulation.

NATURAL RESOURCES

Neither the No Action Alternative nor the proposed project would result in significant adverse impacts on water quality. The clearing of natural resources within the project site corridor would not be expected to result in any significant natural resources impacts, with the exception of wetlands that would be mitigated. Therefore, under this alternative, the filling of wetlands totaling about 5.6 acres under one option would not occur. However, there would also not be the opportunity for substantial wetland mitigation that could be implemented by the proposed project as a result of these wetland impacts. It is expected that mitigation could more than compensate for the impacts of the proposed project, all options considered.

There would also not be the need for the habitat fragmentation impact avoidance measures of the proposed project with respect, in particular, to the Yukon Avenue, Forest Hill Road, and Richmond Hill Road Connections.

HAZARDOUS MATERIALS

In the No Action Alternative, it is assumed that landfill closure would be completed in accordance with approved DSNY closure plans with oversight by the New York State Department of Environmental Conservation (DEC). It is expected that closure construction at Landfill Sections 6/7 will be completed by 2011. Without the proposed project, the East Park project is expected to move ahead, but no road development is expected on the project site through the 2016 and 2036 analysis years. The potential remediation of contamination along the proposed road corridors would therefore take place only if contamination were encountered during soil disturbance as part of park development. Thus, in the No Action Alternative there would be no need for remediation of hazardous materials as is expected with the future proposed project (off mound).

WATERFRONT REVITALIZATION PROGRAM

Both the No Action Alternative and the proposed project would comply with the City's WRP, although, in the absence of the proposed roads, there would be less opportunity for the general public to reach the waterfront.

INFRASTRUCTURE

Under the No Action Alternative, it is assumed that the final closure construction of Landfill Section 6/7 would be completed by 2011, with continued monitoring and maintenance as required

by the Consent Order and the site permits. DSNY would continue to operate and manage the Fresh Kills Landfill environmental control systems, along with implementation of the monitoring and maintenance programs. The leachate collection and containment system and landfill gas management system would continue to operate after landfill closure as required by DEC.

Under the No Action Alternative, there would not be the need to modify the landfill infrastructure as described in the Landfill Section 6/7 Final Cover Design Report, Addendum 1. However, with the measures proposed by the project, these modifications can be achieved without any significant adverse impacts. Thus, neither this alternative nor the proposed project would have impacts on landfill infrastructure.

Under the No Action Alternative, there would not be the increased stormwater runoff or the need to modify DSNY stormwater basins. However, with the measures proposed by the project, these modifications could be achieved without any significant adverse impacts on stormwater management, infrastructure, or water quality. Thus, neither this alternative nor the proposed project would have impacts on stormwater management infrastructure.

With both the No Action Alternative and the proposed project, there would not be any significant adverse impacts on air emissions, odor emissions, leachate generation, or landfill slope stability. (Additional details on air emissions and leachate generation with the proposed project is provided in Attachment E, "Supplemental DEC Data." Slope stability is addressed in the Landfill Section 6/7 Final Cover Design Report, Addendum 1.)

SOLID WASTE AND SANITATION SERVICES

Neither the No Action Alternative nor the proposed project would have impacts on solid waste or sanitation services. Neither the proposed project nor this alternative would have an impact with respect to the City's Solid Waste Management Plan.

ENERGY

Neither the No Action Alternative nor the proposed project would have impacts on energy.

TRAFFIC AND PARKING

Under the 2016 FGEIS No Build Conditions (which assumes general background growth and future developments without Fresh Kills Park and the proposed park roads), four (4) out of the five (5) intersections analyzed for the SEIS would experience congestion during one or more analyzed weekday and weekend peak hours. Similarly, under the 2036 FGEIS No Build Conditions, all five (5) of the intersections analyzed for the SEIS would also experience congestion during one or more analyzed weekday and weekend peak hours.

As described in the above sections, the SEIS No Action Alternative future conditions assume Fresh Kills Park is built without the proposed East Park roads. As a result, in addition to the future general background growth and developments as assumed under the FGEIS, the No Action future conditions under this alternative would also include the project-generated trips by Fresh Kills Park. Therefore, the five (5) analyzed intersections under the 2016 and 2036 SEIS No Action Alternative future conditions would experience further congestion.

In addition, under this alternative, local traffic conditions would not be relieved. Also, the only means of access to the Confluence area of the park would be via the West Shore Expressway which would exacerbate traffic conditions along this corridor as well as along the streets at the

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periphery of the park, including Richmond Avenue, Arthur Kill Road, Travis Avenue and Victory Boulevard. In the absence of the proposed East Park roads, hundreds of peak hour vehicle trips would have to use these roads in order to access the park from the West Shore Expressway. Thus, this alternative would not achieve the purpose and goals of the project with respect removing the Fresh Kills property as an obstacle to connectivity, improving local traffic circulation and minimizing the impact of the proposed park on local traffic circulation.

Neither the proposed project nor this alternative would impact parking.

TRANSIT AND PEDESTRIANS

The proposed project would not adversely impact transit and pedestrian conditions. Rather, it would provide the opportunity for bus transit service into and across the Fresh Kills Park. Under this alternative these benefits would be foregone.

AIR QUALITY

With respect to mobile sources, no violations of the National Ambient Air Quality Standards (NAAQS) are predicted to occur under either the No Action Alternative or the proposed project.

NOISE

Under the proposed project, no project impacts would occur at local sensitive receptors. Thus, conditions under this No Action Alternative would be similar to the proposed project.

CONSTRUCTION

Since the No Action Alternative would entail only the development of the park and not park roads, this alternative would not generate as much construction activity as the proposed project. Construction-related impacts on archaeological resources would not occur, though with the proposed project, measures are in place to mitigate that impact.

The No Action Alternative would not have the construction-related noise and traffic of the proposed project. However, neither this alternative nor the proposed project would result in significant adverse impacts on air quality, noise, traffic, or transit during construction. The No Action Alternative would also not have the project impacts with respect to wetlands, in particular the wetland impacts under the Forest Hill Road and Richmond Hill Road Connections or the need for the related protection measures during construction.

While a greater intensity of construction would occur with the proposed project as compared to the No Action Alternative, this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to eliminate the potential for any impacts from hazardous materials. It would also occur concurrently with the closure construction of Landfill Section 6/7 now underway, which is a benefit not realized by other alternatives.

PUBLIC HEALTH

In the No Action Alternative, it is assumed that landfill closure construction is completed in accordance with approved DSNY closure plans with oversight by DEC. The leachate collection and containment system and landfill gas management system will continue to operate after landfill closure as required by DEC. Under this alternative, only the development of East Park is

expected on the project site through the 2016 and 2036 analysis years. It is expected that with the proposed project's protection measures in place, no impacts would occur with respect to public health. Thus, neither the proposed project or this alternative would have a significant impact on public health.

IMPACT AVOIDANCE AND MITIGATION

Under the No Action Alternative, there would not be the need for impact avoidance related to the proposed roads or the significant impacts of the proposed project (e.g., traffic, wetlands) that require mitigation.

UNAVOIDABLE ADVERSE IMPACTS

The No Action Alternative would not have any unavoidable adverse traffic impacts. The proposed project would have limited unavoidable adverse traffic impacts.

C. ALTERNATIVE PHASING—FOUR-LANE ROAD (RECONSTRUCTED FINAL COVER WITH NO 2011 ROAD EMBANKMENT CONSTRUCTION)

DESCRIPTION

This section analyzes the environmental impacts of an alternative phasing in which the currently approved closure design proceeds without the proposed 2011 road embankment, and any work required for future East Park Road access and connections therefore would need to be undertaken following final closure of 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, Malcolm Pirnie, January 2001. The City has proposed a 2011 Landfill Section 6/7 closure design that would coordinate the current closure construction with the proposed road embankment, allowing for the future possibility of connections to Richmond Avenue and the West Shore Expressway. This alternate closure is described in the Landfill Section 6/7 Final Cover Design Report, Addendum 1 (Geosyntec for DSNY, September 2009).

The Landfill Section 6/7 Final Cover Design Report, Addendum 1 describes the following required activities to implement an alternative final cover design:

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

As stated above, this alternative phasing assumes closure of Section 6/7 proceeds under the currently approved closure design without taking into consideration the proposed road embankments as presented in the Landfill Section 6/7 Final Cover Design Report, Addendum 1. Therefore, under this alternative, all elements of the completed final closure construction,

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including geosynthetic cap materials, cover soils, landfill gas piping and stormwater management features, within the area of the proposed road corridors would need to be removed or modified in order to implement the proposed road embankments 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 redundant construction activities as compared to implementing the proposed embankments simultaneously with the closure of Landfill Section 6/7. A detailed description of the impacts associated with this alternative is presented below.

OVERVIEW

As described in greater detail below, with this alternative, there would be no delay in the closure of Landfill Section 6/7. However, it is assumed that at some future date, given the need for solutions to local traffic congestion and the need for vehicular access into the proposed park, the landfill cover would need to be reconstructed at a later date to accommodate the proposed road. As with the proposed project, under this alternative there would be the need to avoid, minimize or mitigate impacts from the proposed roads. As with the proposed project, it is expected these measures could avoid or mitigate impacts, although for the landfill crossing segment, these mitigative measures would be more extensive 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, there would be a greater time delay for the remedy under this alternative since implementation would follow closure construction and would require retrofitting, the proposed road embankments into the final cover.

Like the proposed project, this alternative would not be expected to impact odors or landfill air emissions either during construction or operation, although the techniques to implement such measures under this retrofit alternative are expected to be more complicated and expensive. 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 changes in the DSNY stormwater management basins; however it is expected that this alternative, like the proposed project, could address the stormwater management issues without any adverse impacts to landfill system hydrology or water quality. Like the proposed project, this alternative would also require both the filling of wetlands and a comprehensive mitigation plan for the construction of the roads. Lastly, park roads under this alternative would generate similar habitat fragmentation impacts and would necessitate design measures to minimize these impacts, as would the proposed project. A more detailed analysis of this alternative follows.

EVALUATION OF IMPACTS

SURCHARGE FILL PLACEMENT AND REMOVAL

The volume of surcharge soils needed to consolidate waste beneath the proposed road corridors would be similar under this alternative and the proposed project. However, with the proposed project, the coordination of the proposed final cover and incorporating the road embankment with the final landfill closure construction would allow closure cover soils to serve as surcharge fill and then be used as cover soil. This coordinated approach reduces the total importation of

soils to the site and thereby reduces air emissions associated with truck and heavy equipment operation, this alternative would extend the road embankment and road construction period, as it would require remobilizing and performing road embankment work on the already installed final cover. It is expected that this alternative construction sequencing would have a significantly longer construction period than installing the embankment simultaneously with the final closure construction. Moreover, based on an estimated volume of 250,000 cubic yards of surcharge fill, this represents more than 20,000 additional truck trips that would need to be made under this alternative. Assuming surcharge fill is obtained from borrow sources 20 miles from the site, this represents over 160,000 gallons of fuel consumption (at an average 5 mpg) for transportation alone which could be avoided if the alternative final cover design is coordinated with Landfill Section 6/7 final closure construction.

WASTE RELOCATION

The Landfill Section 6/7 Final Cover Design Report, Addendum 1 estimates that approximately 198,883 cubic yards of waste (and intermingled cover soils) would be located in order to implement the proposed final cover. Under the proposed plan, the excavated material would provide a benefit by offsetting (reducing) the amount of soil material that otherwise would be required to be imported to achieve the required subgrade elevations and minimum final cover slopes. While the volume of waste requiring relocation would remain unchanged with this alternative phasing, the effort and consumption of materials required to manage the waste would dramatically increase. This is because once Landfill Section 6/7 is closed, DSNY would have to strip large areas of previously completed final cover in order to relocate waste elsewhere in Section 6/7. Assuming the relocated waste could be placed at an average depth of 8 feet, this would require the removal of over 10 acres of final cover. The additional waste would also change the final contours of Section 6/7, requiring additional effort to relocate landfill gas and stormwater management features. Alternately, if re-landfilling of the waste on-site is not permissible, then the excavated waste will have to be disposed of off-site.

LANDFILL GAS PIPING

Landfill gas header piping must be constructed at a minimum three percent slope when placed over waste to provide proper drainage of landfill gas condensate over time. Under the current closure design, landfill gas header pipes are being installed without taking into consideration the proposed Yukon Avenue or Forest Hill Road Connections over the landfill. Therefore, under this alternative phasing option, landfill gas header piping would need to be relocated in the vicinity of the road corridors, and would also require relocation of several hundred feet of landfill gas header back to a high point in the pipe in order to re-establish the minimum slope required for the entire length of header pipe. Therefore, additional construction effort would be required at a later date in order to relocate the header pipe which under the proposed project is addressed as part of the final cover construction. This would also impact waste materials due to relocation damage, require importation of additional cover soils, and cause additional emissions from heavy equipment as compared to constructing the proposed final cover design (Addendum 1) as part of the final cover construction.

STORMWATER

The current stormwater management under the proposed plan directs stormwater along the road corridors to stormwater basins B1, B2, C1, and R. Modifying this system after final closure would require extensive relocation of the stormwater conveyance structures and associated

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adjustment of final closure grades necessary to allow gravity flow of stormwater to the ponds. As a result, areas outside the immediate vicinity of the roadway corridor would also require the removal and replacement of final cover. This alternative would therefore also result in excavation in waste materials with relocation damage, importation of additional cover soils, and additional emissions from heavy equipment as compared to constructing the proposed design as presented in the Landfill Section 6/7 Final Cover Design Report, Addendum 1 as part of initial final cover construction.

CLOSURE COVER REPAIR

The total area of disturbance from the Landfill Section 6/7 Final Cover Design Report, Addendum 1 has been identified as 25.7 acres. The alternative phasing option would therefore require the removal of closure cover from the 25.7 acre area to implement the proposed development. As described under “Waste Relocation” above, an additional 10 acres of closure cover would also have to be removed and replaced for waste relocation under this alternative, raising the total area of closure cover that would have to be replaced to approximately 35.7 acres. Geosynthetic closure cover materials cannot be reused once they are removed. Therefore, based on the area to be reconstructed, this work would create over 900 tons of waste from geosynthetic materials alone. Assuming approximately half of the soils previously used for closure cover could be recovered for reuse (the rest would be lost due to contamination with wastes) alternative phasing would require approximately 50,000 cubic yards of additional soil importation. Besides road congestion and wear from approximately 4,100 truck trips required to transport the cover soil (assuming the cover soil is obtained from borrow sources 20 miles from the site), this represents over 32,000 gallons of fuel consumption for transportation alone which could be avoided if the alternative final cover design is coordinated with Section 6/7.

Based on conservative estimates, construction of the proposed 2011 final cover design after closure of Landfill Section 6/7 would require a minimum of 180 working days using 6 pieces of heavy equipment. Based on a typical fuel usage of 3 gallons per hour for each piece of equipment, this represents over 25,000 gallons of fuel consumption for construction equipment which could be avoided if the alternative final cover design is coordinated with Landfill Section 6/7.

SUMMARY OF IMPACTS

Based on this analysis, an alternative phasing that requires retrofitting Landfill Section 6/7 with the proposed road embankments 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 will result in significant impacts to air quality and road construction to Staten Island residents that are avoidable with the proposed project.

D. ALTERNATIVE PHASING—FOUR-LANE ROAD (RECONSTRUCTED FINAL COVER WITH TWO-LANE 2011 ROAD EMBANKMENT)¹

DESCRIPTION

This alternative phasing is similar to the alternative analyzed above; however this alternative assumes that the landfill cover incorporates only a two-lane road embankment and would need to be modified at a later date for a four-lane park road. This assumes, for example, a condition where once the Yukon Avenue Connection is operating, the demand then exceeds capacity, and the final cover would then need to be modified in order to widen the road and provide traffic congestion relief and access to the park. Figures 22-1 and 22-2 present grading modifications under this two-lane road embankment alternative.

The difference in impacts between modifying the landfill final cover construction at this time to accommodate a four-lane road as compared with a two-lane road are quite limited as compared with the more significant impact of needing to retrofit the landfill cover at a later date. For example, the estimated volume of cut necessary to provide the road embankment at Yukon Avenue Connection is only 39,645 cubic yards more to create a four-lane embankment at this time. The difference in volume is primarily due to a reduction in the limits of grading on the east-facing side of the landfill.

The estimated volume of cut necessary to provide the road embankment for Forest Hill Road Connection under this alternative would only be reduced by an estimated 17,000 cubic yards, even less than along the Yukon Avenue Connection. The extent of the grading changes at Forest Hill Road are controlled by the vertical road profile and extend past the road corridor to the south in order to maintain a minimum 4 percent cover system slope. As a result, narrowing of this road corridor has less of an effect than along Yukon Avenue. The number of impacted gas wells would be reduced from four to three if the two-lane option were implemented for the road embankment at this time (this is also a minor difference).

Otherwise, the physical changes with respect to the landfill under either a modification for a four-lane road or a two-lane road are quite similar. Along the Yukon Avenue Corridor, the impacted gas wells, gas header line, and stormwater features, firewater line and overhead electric lines would be the same. Along the Forest Hill Road Connection, the impacted gas headers and lateral pipes, stormwater management features, would not change regardless of the option selected.

However, assuming that the two-lane road would need to be widened to a four-lane road at a later date, this alternative phasing would have similar if not greater impacts than that discussed above for the four-lane road alternative phasing. These significant adverse impacts include added material that would need to be moved at a later date resulting 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 operating roads (only one way in each direction) to the extent that such a retrofitting would be highly impractical at a later date. It is therefore concluded that this alternative phasing option would also result in

¹ This analysis would apply to an alternative that would require modifying the landfill cover in order to widen the road embankment from 40 feet (two lanes) to a 60-foot-wide (four lanes wide) at a later date.

significant impacts to air quality and road congestion that are avoidable with the proposed project, and would also would compromise the project's goals and objectives and adversely impact local circulation and neighborhood character.

E. ALTERNATIVE ALIGNMENT: RICHMOND HILL ROAD CONNECTION (WEST OF LANDFILL SECTION 6/7)¹

INTRODUCTION

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 passing over the Landfill via the "Yukon Saddle," heading north along Richmond Avenue berm and crossing the stormwater basins and wetlands to reach the intersection of Richmond Hill Road at Richmond Avenue. As described in greater detail below, three specific road alignments were considered under this alternative: 1) off the landfill (outside the solid waste management unit area boundary); 2) a placement on the existing landfill service road; and 3) a placement up the higher elevation of the landfill. As described below, this Alternative Road Alignment would have impacts similar to the proposed project in many respects. However, there are specific differences with respect to road geometry, landfill conflicts, environmental impacts, and park conflicts that are described below.

OVERVIEW OF ENVIRONMENTAL IMPACTS

The proposed project under this alternative 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 this alternative (i.e., the wetlands along Main Creek). As with the proposed project, it is expected that these 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 significant impacts on odors or air emissions either during construction or operation. 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 with this alternative there would be changes in hydrology due to road runoff and changes in the DSNY stormwater management basins. However, the runoff generated under this alternative would use less of the DSNY basin and more of the Main Creek wetlands for stormwater runoff discharge given the alignment of the park road under this alternative. Thus, in addition to the proposed road, stormwater management under this alternative could impact more of the Main Creek tidal wetlands. This alternative would therefore also require filling/disturbing the Main Creek wetlands rather than only the engineered wetlands east of Landfill Section 6/7. Thus, this alternative would require a more comprehensive wetland mitigation plan than the proposed project and would have to address the filling and disturbance impacts of the more natural tidal wetlands along Main Creek. Lastly, there would be impacts related to habitat fragmentation

¹ Details on the design and evaluation of this alternative for the alignment on the landfill perimeter service road are presented in the "Conceptual Alternatives Road Report," Arup et al., September, 2007.

under this alternative, including impacts in the alignment segment northwest of Landfill Section 6/7 and near the Main Creek/William T. Davis Wildlife Refuge complex.

GENERAL ENVIRONMENTAL IMPACTS

Like the proposed project, under this alternative it is assumed that the project site would be developed as a park with proposed access roads. The benefits expected to result from the proposed Fresh Kills project, of which East Park is a substantial component—including the creation of a 2,163-acre park and public access to the waterfront—would also be realized under this alternative. Neither the proposed project nor these alternatives would have an impact on socioeconomic conditions or community facilities. Both would provide significant open space benefits as well as benefits for urban design and visual resources. Neither would have shadow impacts or impacts on historic architectural resources. Both have the potential to impact archaeological resources, which would have to be addressed as the project designs are advanced in order to determine the specific areas of archaeological impact could occur and if any field research or mitigation is necessary. Neither would significantly adversely impact neighborhood character. Hazardous materials impacts would be similar, and the appropriate impact avoidance and mitigation would be required.

This alternative would be generally consistent with New York City waterfront revitalization program policies. The increased demands on solid waste and sanitation services would be similar and neither this alternative nor the proposed project would result in significant adverse impacts on these services. Likewise, neither this alternative nor the proposed project would cause significant adverse impacts on utilities. In addition, other requirements of the proposed project with respect to public health protections would also be provided to protect public health. Traffic volumes would be the same, thus the traffic impacts would be similar, as would the impacts on air and noise conditions. Impacts on transit and pedestrians would also be similar. With the proposed project, there would be no unavoidable adverse impacts. All impacts of the proposed project would be avoided or mitigated.

Where the proposed project and this alternative differ is primarily in the areas of road alignment and design engineering, conflicts with landfill systems, natural resources, and park design. These differences are presented below.

DESCRIPTION OF ALTERNATIVES AND IMPACTS OF THREE ALIGNMENT CORRIDORS WEST OF LANDFILL SECTION 6/7

OFF-LANDFILL PLACEMENT

The off-landfill alignment avoids significant impacts with the landfill infrastructure. In developing the off-landfill alignment, the park road was placed as far outside the landfill cutoff wall as possible with conceptual allowances for drainage. Thus, under this alternative, an off-landfill road would have to be constructed on a berm in the wetlands or on a viaduct structure, as there is only a narrow strip of land between the landfill perimeter and the Main Creek wetlands. Much of this section of Main Creek includes tidal wetlands that have been mapped by DEC, and are also mapped as part of the National Wetlands Inventory, and are designated as significant coastal fish and wildlife landscape by the New York State Department of State (NYS DOS). All three agencies—NYS DOS, DEC, and the U.S. Army Corps of Engineers (USACE)—would review the project for impacts in a permitting capacity. This alignment could also potentially have the following impacts:

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- It is estimated that this alignment could impact up to 14 acres below the 10-foot contour line as currently surveyed. This would include activities such as filling and grading in both tidal wetlands and tidal wetland adjacent areas, interrupting mapped high marsh, intertidal marsh, and some formerly connected wetlands linked hydrologically and ecologically with the William T. Davis Wildlife Refuge to the North.
- A portion of the road would be constructed within existing tidal wetland areas, which would require review by NYSDOS and permitting by DEC and USACE. Assuming about half of this area (7 acres) is tidal wetlands, mitigation under the Tidal Wetlands Act and State Environmental Quality Review (SEQR) may require 24 to 32 acres of new or substantially improved tidal wetlands. Under the two-lane alignment, this potential impact reduces to 11 acres of impacted tidal wetlands adjacent area (estimated at 5 to 6 acres of tidal wetlands), or an estimated mitigation area of 15 to 24 acres. In either case, from a natural resource perspective, an alignment with less impact on tidal wetlands would be much preferred.
- If there are other viable alternatives without substantial wetland impacts, it may be difficult or impossible to get permits for this alignment.
- Soft soils within the tidal wetland area would likely not provide an adequate foundation for embankment roadway construction without engineering modifications such as overexcavation and replacement and sheet pile bulkheads.
- Placing the roadway on water's edge restricts park visitors' contact with Main Creek. Without massive wetland filling in addition to that for the roadway, a waterside pedestrian/bike path would not be possible in this scenario.
- No creek-side space would be available for a landscape buffer that would provide landscape, filter road runoff to reduce wetland impacts, and reduce the visual prominence and noise of the road.

The impacts associated with the two-lane alternative only differ from those of the four-lane alternative in degree. The roadway would be about two-thirds as wide and the base of the embankment approximately three-fourths as wide, but would principally result in the same impacts.

ON-SERVICE ROAD PLACEMENT¹

This road alignment alternative was designed to avoid the wetland impacts cited above, as well as to avoid major impacts on the landfill cover, and to use the existing strong, compacted landfill service road. In developing this alternative, the outside edge of the road was aligned to generally coincide with the outside edge of the landfill service road and to avoid placing the leachate system chambers, manholes, vents, and their frequently used access covers within the pavement area. Given that the existing perimeter service road is about 20 feet wide and typically fitted between sloping sides, both the four-lane and two-lane versions, which are approximately 60 and 40 feet wide, extend well outside the existing paved footprint and its plateau. The greater width would be achieved by raising the road surface (which would require filling) so that the inside curve of the road meets the landfill grade without cutting into the landfill cover and providing a swale between the landfill cover and the park road.

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

The consequence of raising the road profile would be that this placement would still potentially intrude farther into the environmentally sensitive Main Creek wetlands and disrupt landfill infrastructure and long-term operations as follows:

- To avoid cutting into the landfill cover, up to 10 feet of fill would need to be placed above the existing service road surface to achieve a finished roadway that integrates properly with the existing slope, with the necessary stormwater management provisions.
- Existing leachate collection and pumping station enclosures would need to be vertically extended to meet the final grade elevations and traffic-bearing covers installed.
- The top of the leachate cutoff wall would need to be protected and hardened to alleviate the load from the overlying roadway fill.
- Should repairs to the leachate trench and cutoff wall become necessary, the high overlaying embankment would severely impede access. In addition, such interventions would result in disruption and potential closure of the Park Road.
- The existing service road would be eliminated and landfill maintenance vehicles and activities would have to share the road with park users and commuters. Even with the addition of auxiliary pavement, the slower movements and stoppages of maintenance vehicles are likely to cause friction with faster vehicles, as well as safety concerns. A separated maintenance road is not feasible, as it would not be able to access the critical infrastructure lying in the area of the cut-off wall.
- Auxiliary accommodations for parking and filling of over-the-road tanker trucks used to collect landfill gas condensate would need to be incorporated into the design. Special precautions for protecting landfill maintenance personnel from roadway traffic would need to be implemented during periodic maintenance of the leachate pumps or electrical systems.
- Placing the roadway on the service road still results in intrusion into the wetland buffer and diminishes the opportunity for a waterside pedestrian/bike path.
- Minimal space would be available for the landscape buffer and filtration of road runoff.

The impacts associated with the two-lane in this alternative differ from those of the four-lane alternative in degree. The narrower two lane road would not require as high an embankment over the existing service road, reaching a height of 6 feet above the leachate trench, nor would it extend as far laterally.

UP-LANDFILL PLACEMENT

In this alignment, the road alignment would be placed higher up on Landfill Section 6/7's western slope so that the road embankment would not impinge on critical perimeter landfill infrastructure features. Since the slope of the road embankment and that of the Landfill Section 6/7 are similar (at approximately 33 percent), development of useful alignment, profile, and cross sections required the testing of several locations on the side slope. The selected location was chosen because it rests on a shelf that is wide enough not to cause the new road embankment to chase the downhill side with fill onto the service road, nor to cut into the uphill side up to the next plateau. These constraints were considered important because this part of the landfill will already have met final closure requirements by the time of road construction.

While this placement avoids impacts to the Main Creek wetlands, the service road, and the leachate collection/cutoff wall system, it places the road far up on Landfill Section 6/7, with

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projected elevations near elevation 90, where there is a deeper waste strata, and with the potential to have the following effects on the environment and the landfill systems:

- Placement of the roadway at this elevation may reduce the short-term slope stability factor of safety below the generally recommended value of 1.5.
- Waste deposits could be expected to settle several feet due to mechanical compression and future decomposition, and require additional up-front capital cost to mitigate impacts.
- Foundation improvement techniques would be necessary to stabilize this waste prior to road construction. Even with preventive measures, more variability in settlement following foundation improvement could be expected due to the inability to reach and treat lower strata.
- The stabilization treatments would likely require a significant amount of energy or resources (i.e. more compaction effort, greater surcharge thickness, deeper drilling for stone columns) in attempting to better improve the long-term performance of material lower in the profile.
- Areas of the east mound adjacent to the western corridor completed closure construction in 2007 and 2008. To ensure the integrity and performance of the landfill cover system, areas already experiencing landfill closure construction would need to be deconstructed prior to foundation improvement and reconstructed as a part of the roadway.
- Since the northern area of Landfill Section 6/7 closure construction is completed, the removal and reconstruction of the cover system would require that an area as wide as the roadway grading, plus an additional 25 feet on each side of the grading limits, be cleared of cover soils, and that the geomembrane be cut and replaced along with modifications to the landfill gas system.
- The roadway alignment on the landfill would conflict with landfill gas wells and with header and lateral collection lines. Modifications to the gas system features along the western slope of east mound would be necessary to accommodate roadway construction.
- After settlement or compression of the waste, soil backfill and regrading would be needed to restore surface integrity. In reconstructing the cover, the gas vent layer (under membrane composite) will be replaced by overlapping the new composite with the existing material; the new membrane would have to be placed and welded, tested, certified, and accepted by DEC. Similarly, the drainage layer geotextile or composite (above the membrane) would have to be replaced by overlapping with the existing material and the barrier solids (roadway embankment material) placed. Reconstruction of the geomembrane cover welds would likely be made using extrusion welds, which are more difficult to construct and test for continuity than fusion welds typically made along the edges of new geomembrane panels.

In summary, the impacts with this alternative alignment are therefore extensive and similar to the alternative above which requires reconstruction of the final landfill cover in order to construction the proposed park roads.

SUMMARY OF WEST OF LANDFILL SECTION 6/7 ALIGNMENTS

All three west alignments described above were proven to have significant ecological or landfill impacts:

- The off-landfill alignment would result in significant impacts on tidal wetlands and natural resources of Main Creek and William T. Davis Wildlife Refuge as well as views and experiences from North Park and William T. Davis Wildlife Refuge.

- The 9- to 14-foot elevation of the landfill service road scenario above the existing perimeter could cause significant impacts upon landfill infrastructure and compromise DSNY landfill maintenance and operations.
- The on-landfill alignment pushes the road well up Landfill Section 6/7, interfering with views from the North Park and William T. Davis Wildlife Refuge, a condition that runs counter to the park goal of leaving this northern primarily for passive park uses.
- The on-landfill alignment would rise to approximately elevation 90, traversing some of the thickest, most unconsolidated layers of waste that are presently being capped. This would result in significant initial and long-term settlement that would not adequately respond to preloading and other foundation improvement measures. Initial construction and the large initial settlement would require cap removal and reconstruction. Differential settlement would continue in the longer term, resulting in undesirable levels of degradation for both the road and the landfill, requiring excessive intervention.

F. ALTERNATIVE ALIGNMENT: EAST PARK LOOP ROAD MODIFIED PROPOSAL¹

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

For instance, this modified alternative includes a revised horizontal alignment that accounts for the typical roadway sections and eliminates non-standard curve radii and horizontal stopping sight distances identified in the analysis of this alternative. Under the proposed design, the maximum safe operating speed is reduced to less than 35 mph at multiple locations because of these design limitations. The road alignment under this modified alternative also does not conflict with any drip leg vaults.

This modified alternative also includes an improved vertical profile. There are 34 locations under the proposed design where vertical grades are less than the desirable minimum of 0.50 percent. While these breaks are in accordance with the 4.0 percent maximum per NYCDDC standards, they exceed the AASHTO maximum grade break criteria of 0.62 percent at 59 locations.

This modified alternative also proposes a number of solutions to eliminate adverse and non-standard drainage conditions. 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 outlet drains installed beneath the roadway. This alternative would have the capacity to completely drain surface runoff at all locations.

In the southern section of proposed East Park Loop Park Roads, where landfill final cover has not been completed, drainage options include installation of a perforated underdrain along the top of the landfill cover with 4-inch HDPE outlets to the road pavement using either a gabion

¹ 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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wall or riprap ditch spaced every 150 feet. This alternative does not have the capacity to drain the entire road, and does not direct runoff away from the roadway surface. However, this alternative involves installation of a 3-foot riprap strip adjacent to the shoulder and allows runoff to percolate into a subsurface crushed-stone trench with 8-inch PVC 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. However, this alternative would require modifying the final landfill cover design in order to provide this alternative drainage system.

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

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 analyzed in this SEIS. However, based on this modified design, this alternative would have less potential for impacts on landfill infrastructure.

This alternative would potentially impact more acres of wetlands than the East Park Loop Road option because of the modified vertical grades. It is also noted that the wetlands impacted by this alternative might be considered higher-value resources since they are more naturally occurring tidal wetlands west of Landfill 6/7.

G. EAST PARK LOOP ROAD ALTERNATIVE—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 under this alternative a single-lane, one-way East Park Loop Road is proposed around Landfill 6/7 rather than a two-lane, one-way loop road. This alternative has been developed to determine if there are reduced impacts to wetlands and impacts on DSNY's infrastructure, as well as monitoring and maintenance obligations.

Impacts under this alternative with respect to landfill closure delays, minimizing, avoiding and mitigating environmental impacts, addressing 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 Alignment (two-lane road) examined in this FEIS. However, based on the design, it would have less potential for impacts on landfill infrastructure.

While the East Park Loop Road option requires the temporary closure of the right lane of the roadway during DSNY leachate pump station maintenance operations, this alternative would also 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.

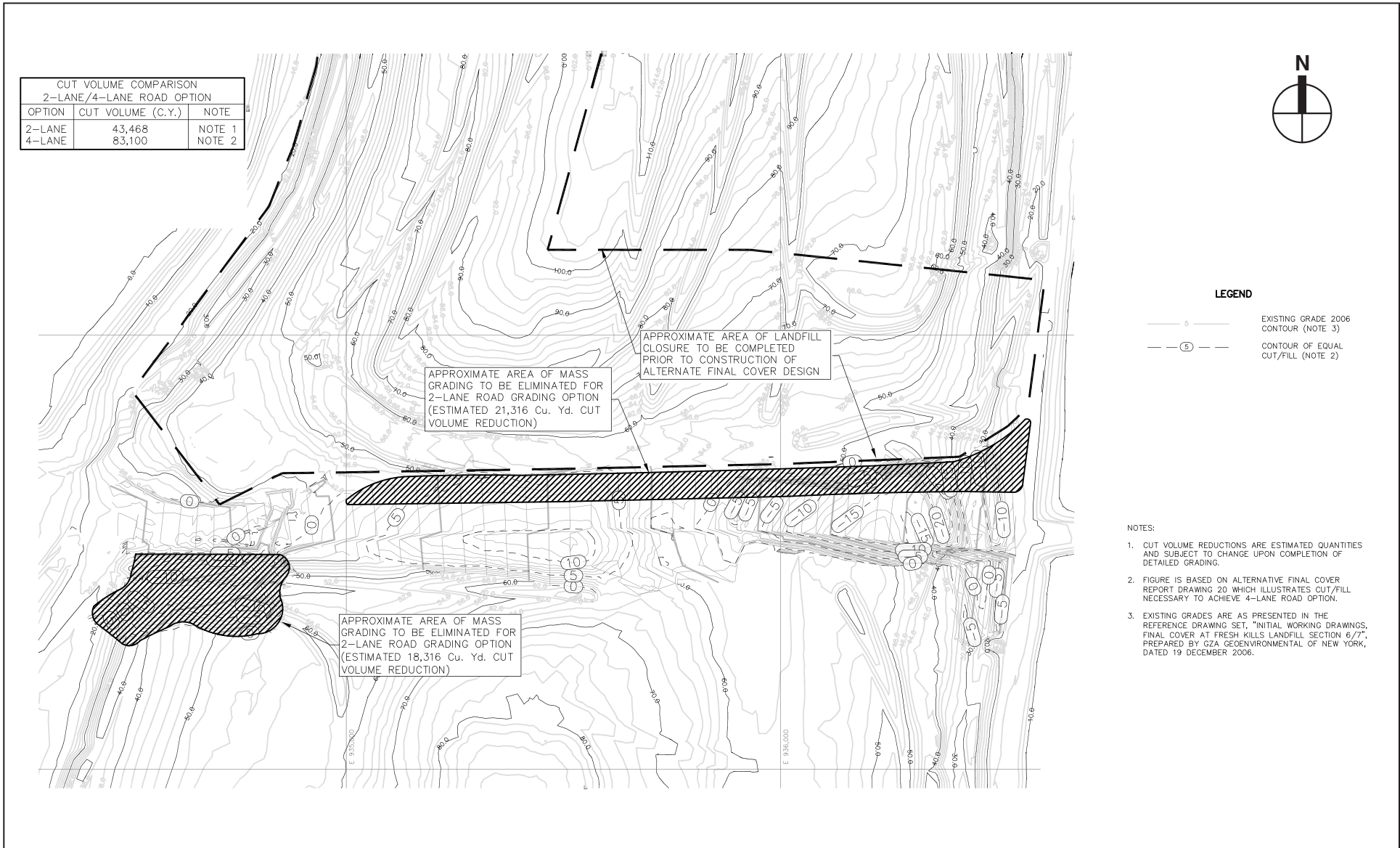
For this alternative, differential settlement between the pavement of the existing haul road and the widened portion outside of the haul road may be less of a concern, since the joint between existing and new pavement would be located in the right shoulder of the roadway rather than in moving travel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

This alternative would also be expected to directly impact slightly fewer acres of wetlands than the East Park Loop Road option and fewer wetland acres than the two-lane option.

H. LIMITED ACTION ALTERNATIVE

This alternative examines the potential impacts of not constructing the proposed park roads, but constructing the proposed East Park. In this alternative, the proposed closure plan would then be used for two informal gravel trails across the landfill that would connect on the east and west with the multi-purpose loop road around the base of the Landfill Section 6/7 which is proposed as part of East Park (see Figure 22-3). It is also assumed that there would be parking proposed at the western trial heads, near the Confluence Loop Road. Impacts under this alternative with respect to landfill closure delays, minimizing, avoiding and mitigating environmental impacts, odors and air emissions, production of leachate, and hazards for landfill slope stability would be similar to the proposed project. As compared to the proposed project, this Limited Acton 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. Thus, unlike the proposed project, there would be no need to avoid, minimize or mitigate impacts (recognizing that project impacts could be mitigated). What the Limited Action Alternative would not achieve are 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. Rather, it would provide more trail connections across the landfill.

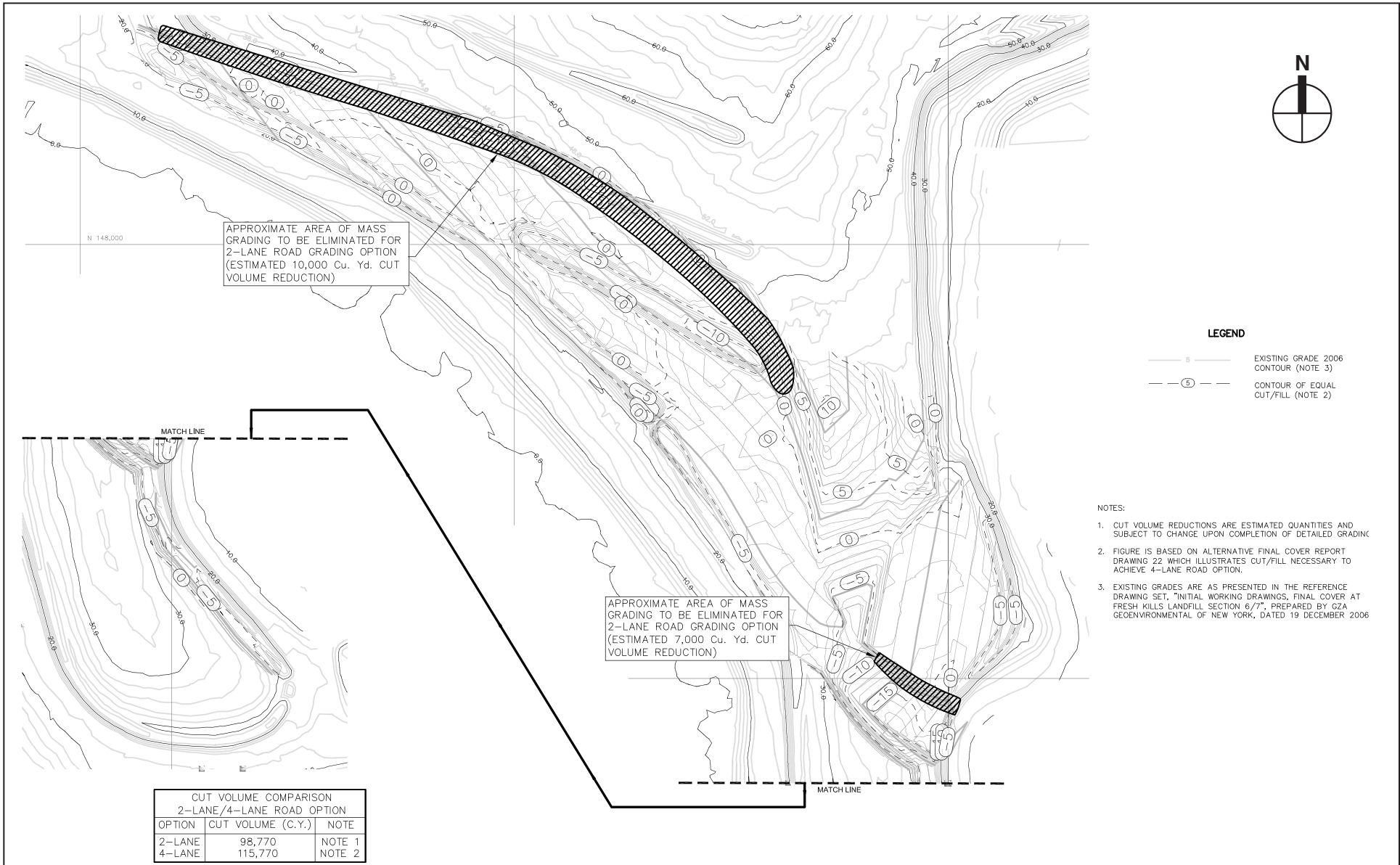
Unlike the proposed project, this alternative would not have any changes in runoff patterns at the site or the hydrology of the current DSNY systems due to road runoff. With the proposed project there would be changes in hydrology due to the road construction; however it is expected that the proposed 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 under the proposed project, they could be addressed through a comprehensive restoration and wetlands mitigation program. Lastly, under this alternative, there would not be impacts related to habitat fragmentation. With the proposed project, these impacts would need to be addressed through road design, particularly with the Yukon Avenue, Forest Hill Road, and Richmond Hill Road Connections. However, through the use of large, arched, natural bottom culverts and other techniques, it is expected that the proposed project could avoid habitat fragmentation impacts. *



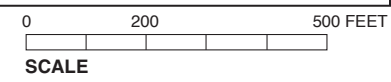
Source: Geosyntec, October 2009



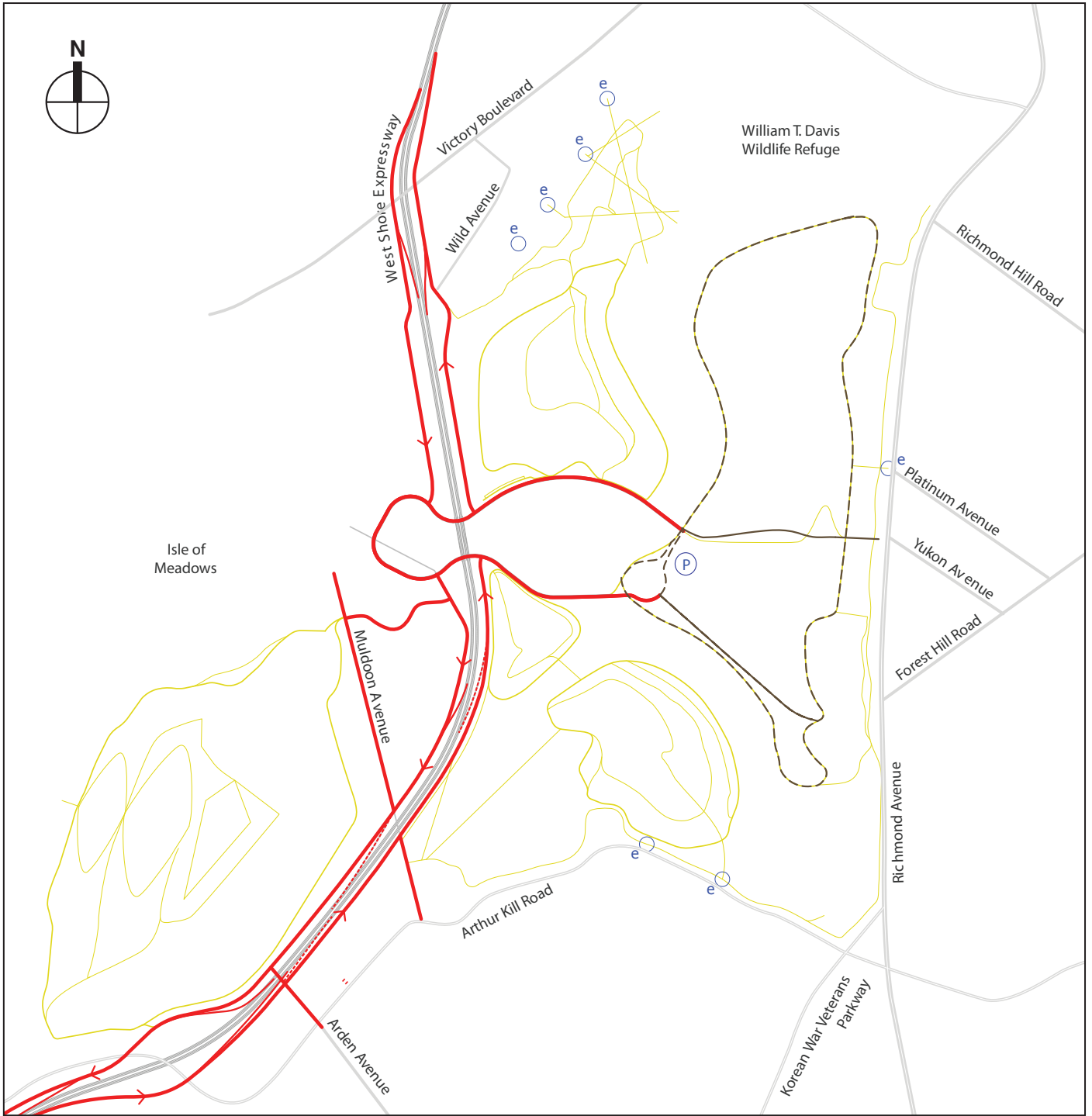
Yukon Avenue Cut Volume Comparison
(Two Lane Road Embankment)
Figure 22-1



Source: Geosyntec, October 2009



Forest Hill Road Cut Volume Comparison
(Two Lane Road Embankment)
Figure 22-2



- Park Roads/West Shore Expressway
- Trails/Paths/DSNY Service Roads