DISTRICT OF COLUMBIA
WATER AND SEWER AUTHORITY

DC CLEAN RIVERS PROJECT
DIVISION J – NORTHEAST
BOUNDARY TUNNEL

ENVIRONMENTAL ASSESSMENT

FEBRUARY 17, 2014

Prepared for:

Prepared by:

Program Consultants Organization
Blue Plains Advanced Wastewater Treatment Plant
5000 Overlook Avenue, SW
Washington, DC 20032
Division J – Northeast Boundary Tunnel
Environmental Assessment

February 17, 2014

Prepared for:
DC Water
810 First Street, NE
Washington DC 20002

Prepared by:
DC Clean Rivers Project
Program Consultants Organization
Blue Plains Advanced Wastewater Treatment Plant
5000 Overlook Avenue, SW
Washington, DC 20032
Executive Summary

This Environmental Assessment (EA) identifies alternatives and evaluates potential impacts associated with DC Water’s proposed action to construct the Northeast Boundary Tunnel (NEBT) to collect, convey, and store combined sewer overflows (CSOs) and provide relief to chronic flood areas within the Northeast Boundary area of the District. DC Water’s proposed action is one of several Anacostia River Projects (ARPs) being implemented through the DC Clean Rivers (DCCR) Project to meet CSO control objectives, water quality standards, and relieve flooding in the District. The existing system lacks the capacity to simultaneously carry sewage and stormwater generated by heavy storms. When the capacity of the existing system is exceeded, combined sewage floods streets and basements and contributes to the impaired water quality of the Anacostia River.

The ARPs were analyzed by the National Park Service in a previous EA in 2010 and are intended to meet the requirements of a Federal Consent Decree entered into by DC Water, the District of Columbia, the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Justice. Under the Federal Consent Decree, DC Water is required to reduce combined sewer discharges to improve Anacostia River water quality.

This EA analyzes the potential environmental impacts that would result from implementing either Alternative A – the No Action Alternative or Alternative B – Northeast Boundary Tunnel. Under Alternative A, DC Water would continue regular maintenance of the existing combined sewer system and employ small-scale flood mitigation techniques in the project area. Under Alternative B, DC Water would construct the NEBT for storage and conveyance of combined sewer overflows. The tunnel would be approximately 27,000 feet long and would be constructed between 50 to 160 feet beneath ground surface. To convey flows to the tunnel, diversion chambers and drop shafts would be retrofitted to the existing combined sewer network. Ten construction staging areas (CSAs) are proposed in the Northeast Boundary drainage area to construct the tunnel and supporting infrastructure. A reasonable range of alternatives and options were considered and dismissed from further evaluation for various reasons presented in this EA (Section 3.4, Alternatives Considered but Dismissed).

Summary of Environmental Consequences of Alternatives Analyzed

DC Water evaluated the potential impacts of Alternative A – the No Action Alternative and Alternative B – the Northeast Boundary Tunnel in relation to the baseline conditions described in Chapter 3: Affected Environment. A detailed discussion of potential impacts is provided in Chapter 4: Environmental Consequences. A summary of the environmental consequences of each alternative is presented in Table ES-1.

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<th>Resource Area</th>
<th>Alternative A – No Build</th>
<th>Alternative B – Northeast Boundary Tunnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soils and Topography</td>
<td>No impacts.</td>
<td>Short-term minor adverse impacts based on soil disturbance required at CSAs. Long-term minor adverse impacts based on proposed grading activities at the WS-CSA.</td>
</tr>
</tbody>
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## Executive Summary

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Alternative A – No Build</th>
<th>Alternative B – Northeast Boundary Tunnel</th>
</tr>
</thead>
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<tr>
<td><strong>Groundwater and Hydrology</strong></td>
<td>No impacts.</td>
<td>Short-term minor adverse impacts due to dewatering activities at the CSAs. Long-term negligible impacts due to increases in impervious land.</td>
</tr>
<tr>
<td><strong>Water Quality</strong></td>
<td>Short-term and long-term moderate to major adverse impacts resulting from CSO discharges to the Anacostia.</td>
<td>Short-term negligible impacts associated with dewatering and runoff from the CSAs. Long-term benefits from the reduction of CSOs to the Anacostia.</td>
</tr>
<tr>
<td><strong>Air Quality</strong></td>
<td>No impacts.</td>
<td>Short-term minor adverse impacts during construction from air emissions and dust. Long-term minor impacts to air quality following construction activities.</td>
</tr>
<tr>
<td><strong>Noise and Vibration</strong></td>
<td>No impacts.</td>
<td>Short-term moderate adverse noise impacts to sensitive receptors due to construction activities. Negligible long-term noise impacts due to operation of the ventilation control facilities. Short-term minor adverse vibration impacts at points along the alignment. No long-term vibration impacts.</td>
</tr>
<tr>
<td><strong>Land Use and Zoning</strong></td>
<td>No impacts.</td>
<td>Short-term and long-term changes to land use at the WS-CSA and no changes to land use designation. No changes to zoning.</td>
</tr>
<tr>
<td><strong>Utilities and Infrastructure</strong></td>
<td>Long-term moderate adverse impacts associated with flood damage to public and private property.</td>
<td>Short-term negligible impacts due to utility relocations. Long-term benefits from the reduction of CSO flooding.</td>
</tr>
<tr>
<td><strong>Cultural / Historic Resources</strong></td>
<td>Long-term minor adverse impacts associated with flood damage to historic buildings.</td>
<td>Short-term negligible to minor adverse impacts on historic resources due to potential effects of vibrations and visual intrusions. Long-term beneficial impacts from the reduction of CSO flooding.</td>
</tr>
<tr>
<td><strong>Archaeological Resources</strong></td>
<td>No impacts.</td>
<td>Short-term and long-term negligible to moderate adverse impacts at four areas of surface disturbance associated with proposed actions; notably, the RS-CSA and WS-CSA.</td>
</tr>
<tr>
<td><strong>Human Health and Safety (including Hazardous Waste)</strong></td>
<td>Short-term and long-term moderate adverse impacts associated with health risks of combined sewer floods.</td>
<td>Short-term negligible to minor adverse impacts associated with construction activities. Short-term minor adverse impacts associated with contaminated soil and groundwater removal. Long-term moderate benefits from the reduction of CSO flooding.</td>
</tr>
<tr>
<td><strong>Transportation (Traffic)</strong></td>
<td>Long-term moderate adverse impacts due to the effects of CSO flooding on streets.</td>
<td>Short-term moderate adverse impacts due to temporary lane closures and restrictions, reduced parking, and increases in the amount of vehicles on area roads. Long-term minor benefits based on the mitigation of roadway flooding.</td>
</tr>
</tbody>
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Division J – Northeast Boundary Tunnel
ES
Environmental Assessment

Summary of Mitigation Measures
DC Water is committed to minimizing impacts from the Northeast Boundary Tunnel project to ensure the protection of natural and cultural resources and the quality of the local communities to the extent possible. The following mitigation measures are proposed to reduce project impacts.

Table ES-2: Summary of Mitigation Measures by Resource Area

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Mitigation Measures for Alternative B – Northeast Boundary Tunnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soils and Topography</td>
<td>• Excavated soils would be removed from the CSAs in an expedient manner.</td>
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<td></td>
<td>• Prior to removal, temporary storage of soils at the CSAs would involve protective measures to prevent runoff.</td>
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<tr>
<td></td>
<td>• Exposed soils would be stabilized and planted with vegetation following completion of construction activities.</td>
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<td></td>
<td>• Where appropriate, trenchless technologies would be utilized in order to minimize impacts.</td>
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<tr>
<td>Geology and Geologic Hazards</td>
<td>• Construction means and methods would be specified that would minimize subsidence.</td>
</tr>
<tr>
<td></td>
<td>• Geotechnical borings would take place to determine site specific conditions at the proposed CSAs.</td>
</tr>
<tr>
<td></td>
<td>• Subsurface monitoring would be carried out during construction to identify potential adverse conditions.</td>
</tr>
<tr>
<td></td>
<td>• Ground improvement measures would be implemented around the proposed structures to stabilize soils prone to unacceptable subsidence or instability.</td>
</tr>
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</table>
Mitigation Measures for Alternative B – Northeast Boundary Tunnel

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Groundwater and Hydrology</strong></td>
<td>• Construction means and methods would be specified that would minimize subsidence.</td>
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<tr>
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<td>• Pre- and post-construction surveys would be performed on structures within the</td>
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<td>zone of influence to accurately determine impacts related to construction. In</td>
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<td></td>
<td>addition, the surveys would identify additional mitigation measures required to</td>
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<td></td>
<td>protect sensitive structures.</td>
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<tr>
<td></td>
<td>• Geotechnical borings would take place to determine site specific conditions at</td>
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<td>proposed CSAs.</td>
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<tr>
<td></td>
<td>• Dewatering operations would be monitored in order to identify the development</td>
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<td></td>
<td>of unacceptable conditions.</td>
</tr>
<tr>
<td></td>
<td>• Ground improvement measures would be implemented if dewatering practices</td>
</tr>
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<td>result in the potential for subsidence.</td>
</tr>
</tbody>
</table>

| **Water Quality**              | • Site controls would be monitored to ensure effectiveness and confirm environmental |
|                                |   quality compliance at CSAs.                                                     |
|                                | • Dewatering practices would include conveyance of sediment-laden groundwater      |
|                                |   to Blue Plains. Polluted waters recovered from the ground would be properly      |
|                                |   disposed in accordance with District Department of Environment standards.        |

| **Air Quality**                | • A dust control plan would be drafted and adhered to during construction         |
|                                |   activities, which could include water spray dust control measures and barriers   |
|                                |   to prevent dust migration.                                                     |
|                                | • Equipment idling times would be limited to the extent possible.                 |
|                                | • Stationary emissions sources would be distanced from one another and run         |
|                                |   separately to the extent feasible.                                             |
|                                | • Dampers at the ventilation control facilities would restrict air movement from   |
|                                |   the tunnel.                                                                     |
|                                | • Minor impacts associated with fugitive odors would be mitigated through the use |
|                                |   of odor control systems.                                                        |
|                                | • Inspections would take place to confirm environmental quality compliance at      |
|                                |   CSAs.                                                                           |
## Mitigation Measures for Alternative B – Northeast Boundary Tunnel

<table>
<thead>
<tr>
<th>Resource Area</th>
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</thead>
</table>
| **Noise and Vibration**       | • Construction means and methods would be specified that would minimize noise and vibration.  
                                  • Noise barriers would be arranged around CSAs as practicable when working near sensitive receptors.  
                                  • Equipment mufflers would be maintained.  
                                  • The number and duration of idling equipment would be limited.  
                                  • Loud construction equipment would be located as far from sensitive receptors as possible.  
                                  • Construction activities would be scheduled to reduce nighttime noise.  
                                  • Construction noise levels would be monitored to confirm that noise levels are minimized at sensitive receptors adjacent to project areas such as residences, businesses and churches.  
                                  • In addition to noise levels, DC Water would monitor vibration levels during construction periods in order to mitigate potential impacts. |
| **Utilities and Infrastructure** | • Utilities would be relocated in advance in order to mitigate risk to the construction schedule.                                                                                                                                                                                                                                                   |
| **Cultural / Historic Resources** | • Pre- and post-construction surveys would be performed on structures within the zone of influence to accurately determine impacts related to construction. In addition, the surveys would identify additional mitigation measures required to protect sensitive cultural and historic resources.  
                                  • Geotechnical borings would take place to determine site specific conditions at proposed CSAs.  
                                  • Construction means and methods would be specified that would minimize ground subsidence, noise, and vibration.  
                                  • Noise barriers would be arranged around CSAs as practicable when working near sensitive receptors.  
                                  • Equipment mufflers would be maintained.  
                                  • The number and duration of idling equipment would be limited.  
                                  • Loud construction equipment would be located as far from sensitive receptors as possible.  
                                  • Construction activities would be scheduled to reduce nighttime noise.  
                                  • Construction noise and vibration levels would be monitored to confirm that levels are minimized. |
| **Archaeological Resources**   | • Archaeological data recovery, curation of the resultant artifacts at an approved curation facility, and a program of public outreach would be conducted as recommended in the DC Historic Preservation Office guidelines and standards for archaeological investigations.                                                                                     |
### Mitigation Measures for Alternative B – Northeast Boundary Tunnel

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Mitigation Measures</th>
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</thead>
</table>
| **Human Health and Safety (including Hazardous Waste)** | • Tunnel rescue teams would be established.  
• Management plans would be developed to address soil and groundwater contamination.  
• Monitoring would be conducted to identify pollutants encountered during construction activities.  
• Inspections would take place to confirm environmental quality compliance at CSAs.  
• Implement approved traffic control plans and review on a regular basis with DC Fire and EMS. |
| **Transportation (Traffic)**                        |  
| **Traffic Study Area #1**                          | • Restrict northbound Mt. Olivet Road, NE traffic from turning left onto West Virginia Avenue, NE.  
• Adjust signal timings at the intersection to reduce delays. |
| **Traffic Study Area #2**                          | • Modify the northbound approach of 4th Street, NE.  
• Eliminate the bike and parking lanes and restripe the roadway between 4th Street, NE and Rhode Island Avenue, NE.  
• Adjust signal timings at the intersection to reduce delays. |
| **Traffic Study Area #3**                          | • Parking restrictions along the northbound approach of 7th Street, NW south of the Rhode Island Avenue, NW intersection.  
• Phasing and timing changes at the intersection of Rhode Island Avenue, NW and 7th Street, NW.  
• Timing and offset modifications at the intersection of Rhode Island Avenue, NW and 6th Street, NW.  
• Adjust signal timings at the intersection to reduce delays. |
| **Socioeconomics**                                 | • Access to homes and businesses would be maintained.  
• Signage stating businesses are open would be posted along pedestrian access routes that are adjacent to the CSAs. |
| **Community Facilities and Services**              | • Implement approved traffic control plans and review on a regular basis with DC Fire and EMS.  
• Access to District services (i.e. refuse, recycling, postal services, snow removal, etc.) would be maintained throughout construction.  
• Access to businesses and community facilities would be maintained.  
• Signage stating businesses are open would be posted along pedestrian access routes adjacent to the CSAs. |
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1 PURPOSE AND NEED

1.1 Introduction

The Northeast Boundary Tunnel (NEBT) was originally planned in 2002 as a major component of DC Water’s Long Term Control Plan (LTCP) to meet court-ordered Combined Sewer Overflow (CSO) control objectives and provide flood relief in the Northeast Boundary area of the District. As one of several Anacostia River Projects (ARPs), the NEBT was designed to comply with the requirements of a Federal Consent Decree entered into by DC Water, the District of Columbia (the District), and the United States, as represented by the U.S. Environmental Protection Agency (EPA) and the Department of Justice. In 2009, DC Water developed a Facility Plan to conceptually design the LTCP components required to control CSOs to the Anacostia River and reduce flooding in the Northeast Boundary area. Since these projects focused primarily on improving the water quality of the Anacostia River and to provide flood relief, they became known as the ARPs.

In 2010, DC Water prepared an Environmental Assessment (EA) that evaluated the potential environmental effects resulting from the implementation of the ARPs. That same year, DC Water renamed the LTCP the DC Clean Rivers (DCCR) Project as a mechanism to administer the projects associated with meeting the Consent Decree requirements. In 2013, the NEBT alignment was modified by the Mayor’s Task Force as a response to severe flood events in Bloomingdale and LeDroit Park to more effectively control flooding. The realignment of the NEBT resulted in the preparation of this EA to identify and evaluate potential environmental impacts of the proposed NEBT project.

1.2 Project Background

1.2.1 Combined Sewer Systems

Like many older cities in the United States, the sewer system in the District is comprised of both combined sewers and separate sanitary sewers (Figure 1-1). A combined sewer carries both sewage and runoff from storms. Modern practice is to build separate sewers for sewage and storm water, and no new combined sewers have been built in the District since the early 1900's. Approximately one-third of the District (12,478 acres) is served by combined sewers. The majority of the area served by combined sewers is in the older developed sections of the District.

In the combined sewer system, sewage from homes and businesses during dry weather conditions is conveyed to DC Water’s Blue Plains Advanced Wastewater Treatment Plant (Blue Plains), which is...
1. Purpose and Need

located in the southwestern part of the District on the east bank of the Potomac River. There, wastewater is treated to remove pollutants before being discharged to the Potomac River. When the capacity of a combined sewer is exceeded during storm events, the excess flow, which is a mixture of sewage and storm water runoff, is discharged to the District’s receiving waterbodies (Anacostia River, Potomac River, Rock Creek) and its tributaries through an outfall. This excess discharge during storm events is called a combined sewer overflow or CSO. A total of 53 CSO outfalls for the combined sewer system are listed in DC Water’s National Pollutant Discharge Elimination System (NPDES) Permit issued by the EPA.

1.2.2 Long Term Control Plan Development

Communities with combined sewer systems are required to prepare long term plans for the control of CSOs in accordance with the 1994 CSO Policy of Section 402 (q) of the Clean Water Act. In accordance with the CSO Policy and NPDES permit requirements, DC Water submitted a Draft LTCP to EPA in 2001. After an extensive public participation program which generated over 2,300 comments on the Draft LTCP, DC Water submitted a Final LTCP to EPA in 2002. The District Department of the Environment (formerly Department of Health) and EPA approved the Final LTCP and determined that CSOs remaining after implementation of the plan would not cause or contribute to the exceedance of water quality standards, subject to post construction monitoring. Regulatory agencies also determined that the CSOs remaining after implementation of the plan would comply with total maximum daily loads (TMDLs) established for the receiving waters.

The principal components of the LTCP include a system of storage/conveyance tunnels along the Anacostia River, Potomac River, and Rock Creek, pumping station rehabilitation, targeted sewer separation, and Low Impact Development. Projects to control CSOs to the Anacostia River are first in the court-ordered schedule and DC Water has prioritized the design and construction of these projects. In 2009, DC Water developed a Facility Plan to describe the tunnels, drop shafts, overflow facilities, and diversion sewers planned for the Anacostia River. The plans also took into consideration budgeting, funding, and coordination needed to implement the ARPs. Ultimately, DC Water determined that the proposed facilities, including the NEBT, would satisfy the water quality goals of the LTCP and the Federal Consent Decree. When completed, the ARPs are expected to reduce the annual volume of CSOs to the Anacostia River by 98 percent, and number of overflows from 82 to 2 in an average year of rainfall.

1.2.3 Chronic Flooding in the Northeast Boundary Drainage Area

The Northeast Boundary drainage area (or sewershed) is located in a highly-developed area of Washington, DC and is served by a combined sewer system. The Northeast Boundary sewershed includes the District neighborhoods of Kingman Park, Trinidad, Gallaudet, Ivy City, Brentwood, Eckington, Bloomingdale, LeDroit Park, Old Soldiers Home, Brookland, Petworth, Columbia Heights and others. The drainage area encompasses approximately 4,300 acres of land, or 34 percent of the 12,500 total acres of combined sewer area in the District (Figure 1-2).

The Northeast Boundary sewershed has a long history of chronic flooding problems during storm events. The sewer system that serves the Northeast Boundary drainage area was constructed by the Federal Government in the late 1800's when developed areas of the District terminated at what is now Florida Avenue. Since construction of the system, population within the Northeast Boundary sewershed area has grown at an exponential rate. In meeting the growing needs of the population, the District experienced development that transformed previously low-density rural areas into new communities. Impervious areas, which contribute to stormwater runoff, have increased drastically since the late 1800’s when the sewer system was constructed. Most of the sewer pipes in the Northeast Boundary drainage area were constructed prior to 1910, well before the District’s 15-year storm design standard was established.
Consequently, the existing Northeast Boundary Trunk Sewer and many of its connecting sewers do not have the capacity to convey storms with return frequencies beyond the 2-year storm without flooding.

Capacity limitations associated with the Northeast Boundary Trunk Sewer were identified in the late 19th Century, and further development of the District has exacerbated this problem. Many studies of these areas conducted during the latter half of the 20th Century proposed sewer system capacity improvements, but recognized that the large scale of necessary improvements were extremely challenging from both a cost and constructability standpoint. As a result of the capacity limitations, many of the low-lying areas within the Northeast Boundary sewershed have become chronic flooding areas due to the surcharging of sewers during storm events. Known chronic flood areas in the Northeast Boundary sewershed are listed in Table 1-1 and shown in Figure 1-2.

<table>
<thead>
<tr>
<th>Known Chronic Flood Areas</th>
<th>Approximate Capacity of Current System</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Virginia Avenue, NE and Mt. Olivet Road, NE</td>
<td>Less than 2-year storm event</td>
</tr>
<tr>
<td>Rhode Island Avenue Metro Station</td>
<td>Less than 2-year storm event</td>
</tr>
<tr>
<td>6th and R Streets, NW</td>
<td>5-year storm event (approximate)</td>
</tr>
<tr>
<td>Rhode Island Avenue, NW and T Street, NW (Thomas &amp; Flagler)</td>
<td>5-year storm event (approximate)</td>
</tr>
<tr>
<td>Harvard and Sherman Avenue, NW</td>
<td>2-year storm event (approximate)</td>
</tr>
</tbody>
</table>
| Northeast Boundary Trunk Sewer                                | - Most 2-year storm events
- Less than 2-year storm event in upper reaches of the trunk sewer |
1. Purpose and Need

DC Clean Rivers Project

Division J – Northeast Boundary Tunnel

Environmental Assessment
1.2.4 2012 Bloomingdale Flooding and Mayor's Task Force

In 2012, four major storm events swept through the District and hit the Northeast Boundary drainage area particularly hard, with the neighborhood experiencing severe flooding (see Figure 1-3). The extreme nature of the flooding, the damage to private property, and the health risks associated with exposure to sewage led to a multi-agency response and community calls for answers and action. The Mayor assembled a Task Force to evaluate a range of potential actions to address combined sewer flooding including engineering, regulatory, code revision, and management improvements. Subsequently, the Mayor’s Task Force Report on the Prevention of Flooding in Bloomingdale and LeDroit Park was prepared and issued in December 2013. The Northeast Boundary Neighborhood Protection Project, the outcome of the Mayor’s Task Force, is a three-step infrastructure initiative designed to offload the undersized sections of the existing collection system that serves the Northeast Boundary drainage area by implementing the following projects:

Step 1 (Short-Term):

Construction of green infrastructure projects in Bloomingdale and LeDroit Park as well as the installation of storm drains and a five-foot-wide storm sewer along Rhode Island Avenue, NW to help divert water from area roadways and alleviate flooding.

Step 2 (Medium-Term):

McMillan Stormwater Storage Project – Adding 4 million gallons of stormwater storage within the existing McMillan Sand Filtration cells from a sewer that runs along North Capitol Street, NW; adding in-line storage in a sewer that runs along First Street, NW; and construction of rain gardens along Irving Street, NW to collect and infiltrate stormwater. The estimated construction completion of the McMillan Stormwater Storage Project is Spring of 2014.

First Street Tunnel Project – Adding 8 million gallons of combined sewer storage in a new tunnel under First Street NW to relieve undersized sewers that traverse the Bloomingdale neighborhood. Based on the recommendation of the Mayor’s Task Force, an EA was prepared for the First Street Tunnel in 2013. During the assessment process, DC Water conducted a series of public outreach activities. Extensive mitigation measures were incorporated into the design of the project to minimize temporary construction impacts. Construction of the First Street Tunnel is proposed from October 2013 to the Spring of 2016, in order to provide interim flood relief to the Bloomingdale and LeDroit Park neighborhoods until the NEBT is constructed.

Step 3 (Long-Term):

NEBT Project – This project realigns the NEBT portion of the Anacostia River Projects from the original alignment proposed in the 2009 Facility Plan. Realignment of the tunnel will mitigate flooding more effectively, reduce impacts to private properties and accelerate the construction schedule of the project by three years, from 2025 to 2022. Figure 1-4 provides the improved alignment of the NEBT as related to the original alignment studied in the 2009 Facility Plan.
1. Purpose and Need

DC Clean Rivers Project
Division J – Northeast Boundary Tunnel

Figure 1-4
Original and Improved Northeast Boundary Tunnel (NEBT) Alignments
1.3 Overview of Related Studies

In 2010, the National Park Service and DC Water prepared the Anacostia River Projects Environmental Assessment (ARP EA) (NPS 2010). The facilities examined in the ARP EA include the Blue Plains Tunnel, Anacostia River Tunnel, NEBT, and associated diversion sewers and overflow facilities as illustrated in Figure 1-5. The ARP EA identified and evaluated the potential environmental effects that could result from the implementation of the ARPs as proposed in DC Water’s LTCP. The ARP EA acknowledged that CSOs contribute to water quality degradation in the Anacostia River and that chronic flooding persists in the Northeast Boundary sewershed and along the Northeast Boundary Trunk Sewer. DC Water assessed the causes of these chronic flooding problems and developed solutions that were presented in the ARP EA, which are summarized as follows:

- The Northeast Boundary Trunk Sewer and portions of its branch sewers have inadequate capacities to carry stormwater flows generated by moderate storms.
- Surcharge, or overflows, of the trunk and branch sewers occur during short, intense storms and can cause sewer backups in certain areas.
- Certain collection sewers that drain the area have adequate capacity, but operate ineffectively due to backwater conditions in the Northeast Boundary sewershed. Backwater conditions occur due to a rise in surface elevation of flowing water upstream from, and as a result of, an inability to convey large flows.
- Certain areas served by branch sewers are at lower elevations than the crown, or top, of the Northeast Boundary Trunk Sewer at the point of connection, preventing gravity flow of sewage from these areas into the Northeast Boundary Trunk Sewer and causing backups.

1.4 Purpose and Need for the Action

The purpose of the NEBT project is to mitigate flooding and sewer backups that have historically impacted the Northeast Boundary area of the District and to aid in the control of CSOs to the Anacostia River through storage and conveyance of excess wet weather flows.

The project is needed to improve the existing combined sewer system in the Northeast Boundary drainage area by increasing CSO storage and conveyance capacity. Continued use of the existing combined sewer system will result in CSO flooding during moderate storm events. DC Water’s investigation of the Northeast Boundary sewershed determined that the existing trunk sewers in the area have the capacity to convey between 2- and 5-year storms. The District’s current design standard is to size combined and storm sewers to convey a 15-year storm for 24 hours. Because of the low capacity of the existing sewers, flooding and basement backups occur during intense rain events. One of the purposes of the project is to add capacity to the existing system to bring the system up to the current design standards. This will substantially mitigate flooding and basement backups.

The project is also needed to control combined sewer overflow discharges to the Anacostia River. Based on DC Water’s approved LTCP, the District Department of Environment and EPA determined that CSOs remaining after implementation of the plan would not cause or contribute to the exceedance of water quality standards, subject to post construction monitoring. The NEBT project is one of the control measures in the LTCP and required by the Consent Decree. If the project is not constructed, CSO discharges to the Anacostia River would not meet the requirements of the Consent Decree and NPDES Permit.
1.5 Project Area

The NEBT would commence just south of Robert F. Kennedy (RFK) Stadium at DC Water’s CSO 019 north drop shaft and terminate just west of the intersection of Rhode Island Avenue, NW and 6th Street, NW (illustrated in Figure 2-1). The CSO 019 north drop shaft is the northern terminus of the future Anacostia River Tunnel (ART), and from this point the tunnel would course in a northern direction along the west bank of the Anacostia River, beneath Langston Golf Course and then would shift to the west along the southern limits of the U.S. National Arboretum and the Mt. Olivet Cemetery beneath Mt. Olivet Road, NE. The tunnel would continue in a west/northwest direction beneath West Virginia Avenue, NE and New York Avenue, NE. The tunnel would course beneath the Amtrak railyard and continue to the northwest beneath 13th Street, NE and Bryant Street, NE. To the east of the Rhode Island Avenue Metro Station, the tunnel would shift to the southwest beneath Rhode Island Avenue through the North Capitol Street, NW, First Street, NW, and Florida Avenue, NW intersections and terminate between Marion Street, NW and 6th Street, NW.

Along the tunnel alignment, there are ten (10) proposed construction staging areas (CSAs), which are illustrated in Figure 2-1 and described in detail within Section 2.3. CSAs are the physical locations where construction work would occur at the ground surface. Where possible, the CSAs are located as close to the existing chronic flood areas as described in Section 1.2.3. Table 1-2 below describes the major CSAs and their locations associated with the NEBT project.

<table>
<thead>
<tr>
<th>CSA</th>
<th>Abbreviation</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSO 019</td>
<td>CSO 019-CSA</td>
<td>On NPS land, just south of RFK Stadium along the west bank of the Anacostia River and adjacent to DC Water’s existing Swirl Facility and East Side Pumping Station.</td>
</tr>
<tr>
<td>Mt. Olivet Road, NE</td>
<td>MOR-CSA</td>
<td>Mt. Olivet Road, NE between Capitol Avenue, NE and the Mt. Olivet Cemetery. District property adjacent to the Mt. Olivet Cemetery.</td>
</tr>
<tr>
<td>W Street, NE</td>
<td>WS-CSA</td>
<td>District property in an area of mixed open space between W Street, NE and the Amtrak railyard.</td>
</tr>
<tr>
<td>Rhode Island Avenue, NE</td>
<td>RIA-CSA</td>
<td>Intersection of Rhode Island Avenue and 8th Place, NE.</td>
</tr>
<tr>
<td>4th Street, NE</td>
<td>4S-CSA</td>
<td>Intersection of 4th and Adams Streets, NE and the intersection of 4th Street NE and Rhode Island Avenue, NE.</td>
</tr>
<tr>
<td>Florida Avenue, NW</td>
<td>FLA-CSA</td>
<td>Intersection of 3rd Street, NW and Florida Avenue, NW and the intersection of 3rd Street, NW and Rhode Island Avenue, NW.</td>
</tr>
<tr>
<td>Thomas Street Pumping Station</td>
<td>PS-CSA</td>
<td>Intersection of Thomas and First Streets, NW.</td>
</tr>
<tr>
<td>Channing Street Mining Shaft</td>
<td>CS-CSA</td>
<td>First Street, NW between Channing Street, NW and McMillan Drive, NW. McMillan Sand Filtration Site – immediately east of First Street, NW and north of Channing Street, NW.</td>
</tr>
<tr>
<td>T Street, NW</td>
<td>TS-CSA</td>
<td>Intersection of T Street, NW and Rhode Island Avenue, NW.</td>
</tr>
<tr>
<td>R Street, NW</td>
<td>RS-CSA</td>
<td>Intersection of 6th Street NW, R Street, NW and Rhode Island Avenue, NW.</td>
</tr>
</tbody>
</table>
1.6 Relevant Laws, Regulations, and Policies

The ARP EA, completed in 2010, was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and National Park Service Director’s Order #12 Conservation Planning, Environmental Impact Analysis and Decision-Making. The project also followed the procedural requirements outlined in Section 106 of the National Historic Preservation Act (NHPA). NEPA and NHPA requirements were applicable because the project studied in the ARP EA impacted National Park Service lands and required a construction permit from the National Park Service, which constituted a Federal action. Segments of the ARP requiring the permit are under construction and DC Water has obtained approval from the National Park Service for work on parkland administered by the National Park Service. The realigned NEBT as presented in the Mayor’s Task Force Report and evaluated in this EA avoids any additional impacts to National Park Service land. As a result, the National Park Service decided the realigned tunnel does not affect their Finding of No Significant Impact and therefore, the National Park Service has decided they do not need to participate in the development of this NEBT EA. However, this EA generally follows the procedural requirements of NEPA and satisfies the DC Environmental Policy Act (DC EPA) requirement as a Functional Equivalent to a DC EPA Environmental Impact Statement (EIS). A decision to prepare a stand-alone EA was made for project consistency to supplement and update information already contained in the ARP EA, which included the NEBT. A Supplemental EA to the existing EA was not prepared because the National Park Service DO-12 Handbook does not allow for supplements to an EA and states there should simply be a new EA.

1.6.1 Federal Regulations

1.6.1.1 National Environmental Policy Act

The NEPA was passed by Congress in 1969 and established the nation’s environmental policies with the goal of achieving productive harmony between human beings and the physical environment for present and future generations. To implement this goal, NEPA requires every federal agency to prepare an in-depth study of the impacts of “major federal actions having a significant effect on the environment” and alternatives to those actions. It also requires that each agency make that information an integral part of its decisions. NEPA requires that federal agencies make a diligent effort to involve the interested members of the public before they make decisions affecting the environment. NEPA is implemented through regulations of the Council on Environmental Quality (CEQ), effective 1978 (40 CFR 1500 – 1508).

1.6.1.2 Clean Water Act

The Clean Water Act provides the basic instrument for regulating water pollution and ensuring that surface waters meet the standards allowing for their designated uses. As authorized by the Clean Water Act, the EPA enforces the NPDES permit program, which is designed to limit pollutant discharges to Waters of the United States through regulation of point sources.

1.6.1.3 Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) was enacted in 1980 to provide Federal agencies with the authority to respond to releases of hazardous substances that may endanger the environment. The Act establishes requirements for closed and abandoned hazardous waste sites, prescribes liability for persons responsible in the release of hazardous wastes, and provides a trust fund (also known as the Superfund) for environmental cleanup where no responsible person can be identified.
1.6.1.4 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) authorizes the EPA to control hazardous wastes through their generation, transportation, treatment, storage, and disposal (“cradle-to-grave”). Also, RCRA regulation provides a framework for the disposal of nonhazardous solid wastes. Amendments to RCRA set forth in 1986 enable the EPA to address environmental problems resulting from underground tank storage.

1.6.1.5 Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 focuses Federal attention on environmental health of minority and low-income communities. Through the Executive Order, disproportionately high and adverse effects on minority or low-income communities stemming from Federal actions are identified and addressed. In addition, the Executive Order prohibits discrimination in Federal actions and programs substantially affecting environmental health, and requires Federal agencies to provide communities access to environmental health information.

1.6.1.6 Clean Air Act

Under the Clean Air Act, the EPA has the authority to set limits on air emissions to protect human health and welfare. In order to carry out the Clean Air Act, the EPA established National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. States are required to achieve attainment with NAAQS through the development of state implementation plans. Specifically, Section 112 of the Clean Air Act addresses emissions of hazardous air pollutants.

1.6.1.7 Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) provides the EPA with authority to regulate chemical use in order to evaluate, assess, mitigate, and control risks that may be posed by chemical manufacture, processing and use. Substances regulated under the TSCA include asbestos, lead-based paint, and Polychlorinated Biphenyls (PCBs).

1.6.2 DC Regulations

1.6.2.1 District of Columbia Environmental Policy Act

The District enacted the DC EPA in 1989, which is complied with by DC Agencies whether Federal funding is available or not. In 1997, the final implementing regulations, “Rules to Implement the District of Columbia Environmental Policy Act of 1989,” were published. All projects within the District that involve its agencies must comply with the DC EPA. The regulations to implement DC EPA are provided in Chapter 72, Environment, of the District of Columbia Municipal Regulations (DCMR).

1.6.2.2 District of Columbia Air Pollution Control Act

The Air Quality Division of the District Department of Environment manages air resources in accordance with Title 20 of the DCMR Air Pollution Control Act of 1984.

1.6.2.3 District of Columbia Municipal Regulations, Chapter 27, Noise Control

This policy indicates maximum noise levels for commercial, industrial, and residential land uses. Title 20, Section 2803 of the policy covers noise as a result of construction in residential zones.
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1.6.2.4 District of Columbia Water Pollution Control Act of 1984 (DC Law 5-188)

The District of Columbia Water Pollution Control Act was enacted to restore and protect surface waters in the District. Additional regulations that fall under the authority of the District Department of Environment Water Quality Division include:

- Water Quality Standards for Surface Waters (21 DCMR Ch. 11)
- Ground Water Quality Standards (21 DCMR 1150-1158)
- Water Quality Monitoring Regulations (21 DCMR Ch.19)

1.6.2.5 District of Columbia Underground Storage Tank Management Act

Under the Underground Storage Tank Management Act (20 DCMR Ch. 55-68), the District Department of Environment administers the use and disposal of underground storage tanks (USTs). Approximately 1,000 USTs are located among roughly 700 facilities in the District. Management actions pertaining to USTs include licensing, inspection and enforcement (DDOE 2014).

1.6.2.6 District of Columbia Hazardous Waste Regulations

Hazardous waste management regulations in the District (20 DCMR Ch. 42 and 43) are carried out by the District Department of Environment. The regulations incorporate select provisions of the District Hazardous Waste Management Act of 1977, the Illegal Dumping Act of 1994, and the DC Solid Waste Facility Permit Act of 1995.

1.6.2.7 District of Columbia Stormwater Management Regulations

The District Department of Environment’s Stormwater Management Division aims to reduce stormwater runoff pollution through the implementation of activities that go beyond those required under the NPDES Permit.

1.6.2.8 District of Columbia Watershed Protection Regulations

The District Department of Environment’s Watershed Protection Division’s mission is to conserve soil and water resources in the District and protect its watersheds from nonpoint source pollution.

1.6.2.9 District of Columbia Wildlife and Habitat Regulations

The District Department of Environment’s Fisheries and Wildlife Division has four major components: research and management, aquatic and wildlife education, licensing and regulations, and fishing. Activities regulated are mainly those with potential to harm species and habitat. The District’s Wildlife Action Plan covers threatened/endangered species, common habitat, and where those species and habitats are commonly found in the District.

1.6.2.10 Historic Landmark and Historic District Protection Act of 1978 (DC Law 2-144, as amended)

This District law and its implementing regulations “District of Columbia Municipal Regulations Title 10A Historic Preservation” directs the Mayor, heads of subordinate agencies, or heads of independent agencies with jurisdiction over an undertaking to take into account the effect of that undertaking on properties listed or eligible for listing in the District of Columbia Inventory of Historic Sites. Further, the State Historic Preservation Officer shall be afforded a reasonable opportunity to comment on the
undertaking. This Act also authorizes a Historic Preservation Review Board (HPRB) to advise the Mayor on applications referred to it for the demolition or alteration of properties listed or eligible for listing in the District of Columbia Inventory of Historic Sites, including Historic Landmarks or structures within Historic Districts.

1.7 Overview of Public Participation

Public involvement related to the Anacostia River Projects has been ongoing since DC Water began development of the LTCP in 1998. Public involvement activities continued through the approval of the LTCP by the District Department of Health in August 2003 and the EPA in 2004. Additionally, public involvement activities occurred during the development of the Facility Plan for the ARPs between 2005 and 2009. In 2010, an EA was developed for the ARPs by DC Water and the National Park Service, in which public involvement was continued through the EA process. Public involvement activities conducted during the development of the LTCP, Facility Plan, and ARP EA are described in detail in Chapter 1 of the ARP EA.

More recently, public outreach has been conducted in conjunction with the development of the Mayor’s Task Force Report on the Prevention of Flooding in Bloomingdale and LeDroit Park (2012). The Mayor’s Task Force Report was developed following severe storms in July and September 2012 that flooded streets and properties within the Bloomingdale and LeDroit Park neighborhoods. During the development of the Mayor’s Task Force Report, DC Water collected information and communicated with the public in a variety of forums. Public outreach efforts related to the 2012 storms and the subsequent Mayor’s Task Force Report are presented in Section 3.4 of the Report and are also outlined in Chapter 2 of the First Street Tunnel EA (DC Water 2012). DC Water has conducted numerous other outreach efforts since the release of the Mayor’s Task Force Report. These efforts are also summarized in Chapter 2 of the First Street Tunnel EA.

During development of the First Street Tunnel EA, DC Water performed public outreach that included meetings with Councilmembers, Advisory Neighborhood Commissions (ANCs), Small Member Districts, Civic Associations, and local residents and businesses. Following the public release of the Draft EA on April 12, 2013, a public review and comment period was provided from April 15 - May 15, 2013, during which numerous comments were received by mail and email. A public meeting was also held on the evening of April 24, 2013 at St. George’s Episcopal Church that drew approximately 40 attendees. DC Water conducted briefings from May through July 2013 to discuss the Draft EA with the Ward 5 Councilman, ANC 5E, the Bloomingdale and Stronghold Civic Associations, and for residents of Flagler Place, Thomas Street, and First and V Streets. Due to the level of community concern following the public release of the Draft EA, DC Water prepared a Final First Street Tunnel EA to incorporate comments received from the public. DC Water revised its project plans during the process and was able to reduce the footprint of proposed CSAs. Also, revised plans for the First Street Tunnel included additional mitigation measures to further reduce impacts to the local communities. These additional mitigation measures are outlined in the Final EA, which was made available for public review from July 29, 2013 to August 15, 2013. Public involvement efforts conducted for the First Street Tunnel project are detailed in Chapter 2 of the Final First Street Tunnel EA and will continue through project completion, tentatively scheduled for March 2016.

Public involvement for the NEBT EA began on October 7, 2013 with the advertisement of a public informational meeting that occurred on October 17, 2013 and a public comment period that ended on November 15, 2013. DC Water used the following strategies to initiate public participation and encourage meeting attendance:
1. Purpose and Need

- Distributed approximately 7,663 meeting flyers to customers adjacent to the proposed tunnel alignment on October 4, 2013;
- Implemented approximately 4,000 robo-calls between October 3, 2013 and October 9, 2013 to residents along the proposed tunnel alignment;
- Circulated a press release to area wide news organizations and posted the press release onto the “News & Alerts” section of the DC Water website on October 8, 2013;
- Posted meeting information on Twitter and Facebook on October 8, 2013;
- DC Water created an external project webpage (http://www.dcwater.com/northeastboundarytunnel) that went live on October 8, 2013 and provides project details and information on public informational meetings;
- Emailed public meeting information to community stakeholders such as Councilmembers, ANCs, and Civic Associations on October 9, 2013;
- Announced the public meeting and comment period on several local neighborhood blogs on October 9, 2013; and

The public meeting was held at McKinley Technology High School from 6:30 p.m. to 8:30 p.m. The meeting drew approximately 30 attendees who were provided the opportunity to view displays, discuss the project with DCCR Project staff, and give comments on the project in person. The meeting also included a 30-minute presentation in the school auditorium that began at 7:00 p.m. At the meeting, comment forms were available for written comments. In addition, members of the public were invited to submit comments on the project electronically through the project webpage (provided above), by email to dccleanrivers@dwater.com, or by mailing or faxing written comments to the DCCR Project. No comments were provided at the public meeting; however, 1 correspondence was received by mail prior to the November 15th comment period deadline. After the public comment period had concluded, correspondences were reviewed and used to assist with the development of this EA.

Additional outreach efforts that have been conducted for the NEBT project are summarized in Table 1-3.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Meeting Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ward 5 Councilmember Kenyan McDuffie</td>
<td>• Met with Councilmember on 11/28/12.</td>
</tr>
<tr>
<td></td>
<td>• Councilmember also attended Bloomingdale Civic Association meeting on 12/12/13 and Stronghold Civic Association meeting on 2/4/13.</td>
</tr>
<tr>
<td></td>
<td>• Email sent to notify Councilmember of 10/17/13 EA public meeting.</td>
</tr>
<tr>
<td>Former Ward 5 Councilmember Harry Thomas Jr.</td>
<td>• Meeting held with Councilmember’s staff on 8/23/11.</td>
</tr>
<tr>
<td></td>
<td>• Attended Harry Thomas Sr. Day to provide NEBT briefing to community.</td>
</tr>
<tr>
<td>Ward 7 Councilmember Yvette Alexander</td>
<td>• Meeting held with Councilmember’s staff on 8/16/11.</td>
</tr>
<tr>
<td>ANC 5E</td>
<td>• Meeting held with Small Members Districts (SMDs) on 12/12/12.</td>
</tr>
<tr>
<td></td>
<td>• Meeting held on 2/27/13.</td>
</tr>
<tr>
<td>ANC 5B</td>
<td>• Meeting to provide briefing on NEBT held on 8/17/11.</td>
</tr>
</tbody>
</table>
### Purpose and Need

<table>
<thead>
<tr>
<th>Organization</th>
<th>Meeting Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC 6B</td>
<td>Meeting to provide briefing on NEBT held 8/17/11.</td>
</tr>
<tr>
<td>ANC 5E07 and Concerned Citizens of T Street</td>
<td>Meeting occurred on 2/8/13.</td>
</tr>
<tr>
<td>ANC 7D</td>
<td>Meeting to provide briefing on NEBT held with ANC on 9/14/11.</td>
</tr>
<tr>
<td>Bloomingdale Civic Association</td>
<td>Meeting occurred with Bloomingdale on 12/12/12 and 1/28/11.</td>
</tr>
<tr>
<td></td>
<td>Multiple email exchanges to share information about First Street Tunnel, NEBT and Mayor’s Northeast Boundary Neighborhood Protection Project.</td>
</tr>
<tr>
<td></td>
<td>Briefing for Stronghold Civic Association on 7/1/13 to describe mitigation measures addressing community concerns</td>
</tr>
<tr>
<td>Residents</td>
<td>Door hangers distributed on 12/12/11 and on 6/18/12 for drilling on 16th Street between Mt. Olivet and Raum Streets.</td>
</tr>
<tr>
<td></td>
<td>Door hangers distributed on 12/7/12 for First Street Tunnel borings.</td>
</tr>
<tr>
<td></td>
<td>Traffic Advisory distributed on 2/5/12.</td>
</tr>
<tr>
<td></td>
<td>First Street Tunnel Drilling Update distributed via Bloomingdale blog and DC Water website 1/15/13.</td>
</tr>
<tr>
<td></td>
<td>Project Information Sheet created 1/29/13.</td>
</tr>
<tr>
<td></td>
<td>Door hangers distributed 2/12/13 for McMillan work.</td>
</tr>
<tr>
<td></td>
<td>Public meeting on 5/24/13 to solicit public input on the project. DC Water staff was available to answer questions and display boards were provided to illustrate the proposed actions and impacts.</td>
</tr>
<tr>
<td></td>
<td>Door hangers distributed on 6/21/13 for NEBT borings on Mt. Olivet Road.</td>
</tr>
<tr>
<td></td>
<td>Door hangers distributed on 11/27/13 for NEBT borings near Cooper Park.</td>
</tr>
<tr>
<td></td>
<td>Informational flyers mailed to 8,000 households to notify residents of initial NEBT meeting on 10/17/13.</td>
</tr>
<tr>
<td></td>
<td>Phone calls were made to 4,000 households near the NEBT alignment prior to an initial EA public meeting held on 10/17/13.</td>
</tr>
<tr>
<td></td>
<td>Meeting was announced via legal notice in the Washington Post and ads placed in the City Paper and the Washington Post.</td>
</tr>
<tr>
<td></td>
<td>DC Water disseminated a press release announcing the meeting to DC media.</td>
</tr>
<tr>
<td></td>
<td>DC Water announced the meeting via Twitter and Facebook.</td>
</tr>
<tr>
<td></td>
<td>Door hangers were distributed on 1/30/14 for drilling activities on Florida Avenue, NW near 3rd Street, NW and on 4th Street, NE between Adams Street, NE and Rhode Island Avenue, NE.</td>
</tr>
<tr>
<td>Mt. Bethel Baptist Church</td>
<td>Meetings held 1/4/13, 1/17/13, and 5/13/13.</td>
</tr>
<tr>
<td>Windows Café &amp; Market</td>
<td>Project Team Member met with owner on 1/18/13.</td>
</tr>
</tbody>
</table>
1. Purpose and Need

<table>
<thead>
<tr>
<th>Organization</th>
<th>Meeting Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington Metropolitan High School</td>
<td>• Met with Principal, DCPS Facilities Management on 2/15/13, materials provided.</td>
</tr>
<tr>
<td></td>
<td>• Second meeting occurred 2/20/13.</td>
</tr>
<tr>
<td>McMillan Advisory Group</td>
<td>• DC Water presented the Mayor’s Northeast Boundary Neighborhood Protection Project to the McMillan Advisory Group on 2/21/13. The presentation also focused on the difference between the three McMillan site grading/access options.</td>
</tr>
<tr>
<td>Kingman Park</td>
<td>• Presentation to neighborhood association provided on 9/26/11.</td>
</tr>
<tr>
<td>Vanguard Properties</td>
<td>• Meeting held with management 7/13.</td>
</tr>
<tr>
<td>DCPS</td>
<td>• Notification about drilling work at Webb Elementary provided to DCPS on 8/5/11.</td>
</tr>
<tr>
<td>Bethesda Baptist Church</td>
<td>• Meeting held with church about alignment and drilling work on 8/29/11.</td>
</tr>
<tr>
<td>Mt. Olivet Cemetery</td>
<td>• Emailed letter and made phone calls to provide initial notification of Division J alignment on 7/22/11.</td>
</tr>
<tr>
<td>U.S. National Arboretum</td>
<td>• Coordinated outreach regarding alignment and borings on 8/22/11.</td>
</tr>
<tr>
<td>Langston Golf Course</td>
<td>• Called Langston and emailed project information on 7/22/11.</td>
</tr>
<tr>
<td>Events DC</td>
<td>• Project information provided on 8/5/11.</td>
</tr>
<tr>
<td></td>
<td>• Ongoing coordination associated with the Anacostia River Tunnel work.</td>
</tr>
</tbody>
</table>

1.8 Impact Topics Dismissed from Further Study

The topics discussed below would either not be affected or would be affected negligibly by the alternatives evaluated in this document. Therefore, these topics are briefly discussed in this section of the EA and then dismissed from further consideration or evaluation. Negligible impacts are impacts that are localized and not measurable at the lowest level of detection.

1.8.1 Floodplains

Construction within the Federal Emergency Management Agency regulated 100-year floodplain of the Anacostia River is not anticipated as part of the NEBT Project. Therefore, floodplains were dismissed from further analysis in this EA.

1.8.2 Wetlands

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers is authorized to manage impacts to wetlands. Wetlands are defined in the Corps Wetlands Delineation Manual as “those areas that are saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (USACE, 1987).” Guidance provided by the U.S. Army Corps of Engineers in the Wetlands Delineation Manual, Regional Supplements to the Manual, and supplemental publications specify that wetlands possess three criteria: hydric soils, hydrophytic vegetation, and hydrology.
To identify wetlands along the proposed NEBT alignment, DC Water conducted wetland investigations in October 2013. The three criteria were observed in one location; within a drainage system at the southern boundary of the WS-CSA (Figure 1-6). No other wetlands were identified as a result of the investigation. DC Water’s preliminary site designs include construction of a junction shaft and ventilation control facility at the WS-CSA. In order to avoid wetland impacts, the facilities would be constructed outside of the wetland, and in a manner that would avoid any temporary impacts. Therefore, because there would be no impacts to the wetland at the WS-CSA, wetlands was dismissed from further analysis.

![Figure 1-6: Palustrine Scrub-Shrub Wetland at the South End of the WS-CSA](image)

1.8.3 **Wildlife including Rare, Threatened, and Endangered Species**

Wildlife in the vicinity of proposed CSAs includes species typically found in urban environments. Birds commonly observed in the area include house sparrows (*Passer domesticus*), European starlings (*Sturnus vulgaris*), common grackles (*Quiscalus quiscula*), and pigeons (*Columba livia*). Additional species associated with edge habitats created by plantings consist of gray catbirds (*Dumetella carolinensis*), northern mockingbirds (*Mimus polyglottos*), eastern phoebes (*Sayornis phoebe*), blue jays (*Cyanocitta cristata*), and northern cardinals (*Cardinalis cardinalis*). Mammals that are likely to be present among proposed staging areas include Eastern chipmunks (*Tamias striatus*), gray squirrels (*Sciurus carolinensis*), and other small rodents. Based on the ability of these species to adapt to urban surroundings, proposed actions at the staging areas are expected to have minimal impacts on local wildlife. The majority of project construction would take place deep underground, which would have no effects on wildlife at the surface. Therefore, wildlife has been dismissed from further analysis.

Development of the ARP EA in 2010 involved coordination with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the District Department of Environment Fisheries and Wildlife Division. In accordance with Section 7 of the Endangered Species Act, coordination with the agencies was conducted to determine if any District or federally listed rare, threatened, or endangered species occur within areas of the proposed ARPs. One listed species, the short-nosed sturgeon, was noted during agency coordination. Under the NEBT project, no construction would occur within potential sturgeon habitat. Therefore, no impacts to the sturgeon are expected. Otherwise, the agencies determined that there
1. Purpose and Need

would be no impacts to rare, threatened or endangered species from tunneling, and that no further consultation was necessary based on the low potential for the presence of listed species in the proposed project areas.

The evaluation conducted by the Mayor’s Task Force in 2012 determined an improved alignment for the NEBT. Due to the adjustments made to the proposed tunnel alignment, DC Water contacted the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the District Department of Environment Fisheries and Wildlife Division in November and December 2013 to update the agencies on the improved alignment and confirm that no further coordination was needed. To date a response has not been received from the District Department of Environment or the National Marine Fisheries Service. Correspondence received from the U.S. Fish and Wildlife Service on December 4, 2013 provided that “except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist in with in the project area. Therefore, no Biological Assessment or further Section 7 consultation with the U.S. Fish and Wildlife Service is required.” See Appendix B for agency correspondence.

Based on these determinations rare, threatened and endangered species has been dismissed from further analysis.

1.8.4 Vegetation

Vegetation in the project area generally consists of individual street trees, plantings, and turfgrasses. Construction activities at the CSAs would involve impacts to a limited number of trees to include branch pruning, root pruning, and tree removals. Table 1-4 provides the number of street trees within each CSA and species.

<table>
<thead>
<tr>
<th>CSA</th>
<th>Number of Trees</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOR-CSA</td>
<td>33</td>
<td>American Elm (<em>Ulmus americana</em>), Kwanzan Cherry (<em>Prunus serrulata</em>), American Linden (<em>Tilia americana</em>)</td>
</tr>
<tr>
<td>RIA-CSA</td>
<td>9</td>
<td>Willow Oak (<em>Quercus phellos</em>)</td>
</tr>
<tr>
<td>4S-CSA</td>
<td>20</td>
<td>Willow Oak (<em>Quercus phellos</em>), Sugar Maple (<em>Acer saccharinum</em>)</td>
</tr>
<tr>
<td>TS-CSA</td>
<td>21</td>
<td>Sugar Maple (<em>Acer saccharinum</em>), London Planetree (<em>Platanus x acerifolia</em>), Cherry (<em>Prunus spp.</em>), Hackberry (<em>Celtis occidentalis</em>), Crepe myrtle (<em>Lagerstroemia indica</em>)</td>
</tr>
<tr>
<td>PS-CSA</td>
<td>4</td>
<td>Chinese Pistachio (<em>Pistacia chinensis</em>), Ginkgo (<em>Ginkgo biloba</em>), Norway Maple (<em>Acer platanoides</em>), Rotundiloba Sweetgum (<em>Liquidambar rotundiloba</em>)</td>
</tr>
<tr>
<td>CS-CSA</td>
<td>9</td>
<td>Norway Maple (<em>Acer platanoides</em>), London Planetree (<em>Platanus x acerifolia</em>)</td>
</tr>
<tr>
<td>FLA-CSA</td>
<td>9</td>
<td>London Planetree (<em>Platanus x acerifolia</em>), Red Maple (<em>Acer rubrum</em>), Pin Oak (<em>Quercus palustris</em>), Red Oak (<em>Quercus rubra</em>), Scarlet Oak (<em>Quercus cocinea</em>)</td>
</tr>
<tr>
<td>RS-CSA</td>
<td>12</td>
<td>American Linden (<em>Tilia americana</em>), Littleleaf Linden (<em>Tilia cordata</em>), Ginkgo (<em>Ginkgo biloba</em>), Willow Oak (<em>Quercus phellos</em>), American Elm (<em>Ulmus americana</em>)</td>
</tr>
</tbody>
</table>

Source: DC GIS, 2013a
Additional vegetation among the CSAs includes small stands of young trees and turfgrass areas (CSO 019-CSA and WS-CSA).

During construction, DC Water would protect trees to the extent feasible. Tree protection measures would be detailed in the design phase of the project and could include installation of tree protection fencing, construction staging to minimize damage to trees, and development of tree save plans. Trees removed to accommodate construction staging would be replaced with acceptable species determined through coordination with the District Department of Transportation Urban Forestry Administration and in accordance with the DC’s Urban Forest Preservation Act. Based on these considerations, vegetation was dismissed from further analysis.

### 1.8.5 Visual Resources and Aesthetics

Impacts to visual resources and aesthetics resulting from the proposed project would include temporary affects associated with construction equipment and staging. Construction activities would primarily occur underground. Construction of the tunnel, proposed structures, and diversion and ventilation control facilities are proposed at or below existing grades. Minor above-ground facilities would be constructed to support the ventilation control facilities at the MOR-CSA, CS-CSA and RS-CSA in the form of cabinets to house electrical equipment. At the WS-CSA, an above-grade ventilation control facility and retaining wall would be constructed. This facility would add a major structure to the landscape resulting in a change to views from the south, east, and west. Views from the residential area to the north are currently obstructed by trees and topography along W Street, NE. As with other above-ground facilities constructed as part of the ARPs, DC Water would consult with the National Capital Planning Commission and the Commission of Fine Arts as appropriate during the design phase of the project to minimize impacts and to prescribe context sensitive aesthetic treatments. The NEBT would have minor impacts to visual resources and aesthetics from construction of the ventilation control facilities. Overall, the NEBT and its associated elements would not noticeably alter or obstruct views, or adversely impact local aesthetics. Therefore, this impact topic was dismissed from further analysis.

### 1.8.6 Environmental Justice

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” was issued on February 11, 1994 by President Clinton. This order directs Federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority or low-income populations. Minority and low-income populations are present within the project area. In efforts to avoid disproportionately high and adverse effects on these groups, DC Water actively solicits public participation during project planning. Equal consideration is given to all input from the public regardless of race, age, income, or other demographics.

No identifiable effects on human health are expected to result from construction of the NEBT. Consequently, no disproportionate human health effects to minority or low-income populations would occur due to the proposed action. The tunnel is intended to reduce surface flooding, which would provide long-term benefits to residents in affected areas. Because there are no disproportionate effects on human health or the environment associated with the project, environmental justice is dismissed from further analysis in this EA.
1. Purpose and Need

1.9 Impact Topics Analyzed in Detail in this Environmental Assessment

Impact topics are resources of concern that would be affected either beneficially or adversely by the range of alternatives. Impact topics were considered in accordance with all applicable Federal and DC environmental regulations, policies, and orders.

1.9.1 Soils and Topography

Construction of the NEBT and associated components would require soil excavation and removal. Small portions of excavated materials could be reused onsite during construction, but most of the materials would be permanently removed from the project area. In consideration of proposed soil excavation and removal, soils are analyzed as an impact topic in this EA.

1.9.2 Geology and Geologic Hazards

Construction of the NEBT and associated structures would intersect several geologic layers beneath the District. Based on the potential for ground settlement, analysis of project area geology is needed to identify adverse conditions and mitigation measures. As a result, geology and geologic hazards are addressed in this EA.

1.9.3 Groundwater and Hydrology

Construction of the NEBT and associated structures could intersect unconfined groundwater reservoirs. Impacts to shallow groundwater could result in lowering of the water table or effects on local groundwater and surface water interactions. Based on these considerations, groundwater and hydrology is addressed in this EA.

1.9.4 Water Quality

Construction of the NEBT and associated structures could have adverse effects on water quality, in the event of unintended soil transport. Dewatering at the various construction sites would involve discharge of sediment laden waters to the existing combined sewer system. Overall, the NEBT would provide water quality benefits through the reduction of CSO discharges to the Anacostia River. However, based on the potential for adverse impacts to water quality during construction, water quality is analyzed as an impact topic in this EA.

1.9.5 Air Quality

Construction of the NEBT and associated structures could result in air quality impacts from earth moving equipment, emissions from general construction equipment such as generators, fugitive dust, and demolition activities. During construction, DC Water would monitor air quality and apply appropriate best management practices to minimize potential impacts. Long-term minor adverse impacts to air quality would occur due to the operation of ventilation control facilities at the MOR-CSA, WS-CSA, CS-CSA, and RS-CSA. Based on these impacts, air quality is addressed in this EA.

1.9.6 Noise and Vibration

Construction of the NEBT and associated structures are projected to generate noise levels from construction activities that are expected to exceed local noise limits. Operation of the ventilation control facilities as part of permanent tunnel operations are expected to have negligible noise impacts on sensitive receptors. Therefore, noise is addressed as an impact topic in this EA.
Construction activities associated with the NEBT and associated structures could result in varying degrees of ground vibration, based on the types of equipment used and construction methods employed. Potential impacts to adjacent structures range from no perceptible impacts to minor effects. Due to the potential for construction related vibrations to cause impacts, vibration is analyzed as an impact topic in this EA.

1.9.7 Land Use and Zoning

Since the NEBT and associated structures would require temporary and permanent easements, land use and zoning is addressed as an impact topic in this EA.

1.9.8 Utilities/Infraestructure

The construction of the NEBT and associated structures would have minor impacts to utilities during construction. Existing utilities including, but not limited to; gas, electric, communication, water and sewer would need to be relocated to accommodate the proposed structures associated with the NEBT. Additionally, the NEBT would connect to the existing collection system and represent a major upgrade in the District’s sewer infrastructure. Based on these considerations, utilities and infrastructure are addressed in this EA.

1.9.9 Cultural/Historic Resources

The NEBT and associated structures would be constructed in the vicinity of several historic places that are listed, and others that are eligible or potentially eligible for listing, in the DC Inventory of Historic Sites (DC Inventory) and/or the National Register of Historic Places (NRHP). Historic districts in the vicinity of the project area include the McMillan Park Reservoir Historic District, LeDroit Park Historic District, Langston Golf Course Historic District, and the potentially eligible Bloomingdale and Eckington Historic Districts. Other historic sites in the vicinity include the Hecht Company Warehouse, the U.S. National Arboretum, and the potentially eligible Anacostia Park, St. Mary’s Cemetery, and Mt. Olivet Cemetery. To comply with the NHPA and DC Historic Preservation regulations, an assessment of impacts to cultural and historic resources in the vicinity of the proposed tunnel alignment and CSAs is required to resolve any adverse effects through mutually agreed upon avoidance, minimization, or mitigation measures. Therefore, because construction of the NEBT and structures would occur in the vicinity of several historic places, Cultural/Historic Resources are assessed in this EA.

1.9.10 Archaeological Resources

Construction of the NEBT and associated structures would require near surface ground-disturbing activities. Most ground disturbance associated with the NEBT would be confined to previously disturbed areas beneath District roadways, parking areas, or sidewalks. Also, the tunnel itself would be of significant depth so as to avoid disturbance of archaeological resources. However, review of preliminary construction designs identified four areas of surface disturbance (ASDs) within proposed CSAs that are located outside of previously disturbed roadways parking areas, or sidewalks that would result in significant ground disturbances.

In consultation with the DC Historic Preservation Office, DC Water has prepared an archaeological site potential assessment, known as a Phase IA assessment, for areas of surface disturbance (Kreisa and McDowell, 2014). The assessment is based on historical and archaeological background research and limited field investigations, and archaeological site potential is in part based on predictive site location models. Due to the potential presence of previously unidentified archaeological resources and archaeological resources located as a result of the limited field investigations conducted for the Phase IA assessment, impacts to archaeological resources are assessed in this EA.
1. Purpose and Need

1.9.11 Human Health and Safety (including Hazardous Waste)

Overall, the project is expected to have beneficial effects by reducing CSO flooding in the District and improving the water quality of the Anacostia River. However, the proposed actions would involve construction activities in densely populated residential areas. To protect the health and safety of site workers and residents, a number of safe work practices would be employed at the CSAs. Construction activities at the FLA-CSA have the potential for excavation of hazardous waste, while excavation at other sites have the potential to contain contaminated materials. Due to the potential for exposure of hazardous waste and contaminated materials, mitigation measures would be required. Based on these considerations, human health and safety is addressed as an impact topic in this EA.

1.9.12 Transportation (Traffic)

Short-term road detours, road closures, lane restrictions, and other disruptions would be necessary to construct the NEBT. Due to the short-term disruptions required by the proposed project, traffic and transportation is addressed in this EA. No long-term impacts on traffic or transportation are expected to result from the proposed actions.

1.9.13 Socioeconomics

Construction of the NEBT and associated facilities has the potential to result in adverse impacts to the socioeconomic environment. Due to the potential for adverse impacts, socioeconomics is addressed in this EA.

1.9.14 Community Facilities and Services

Construction of the NEBT and associated facilities would result in temporary impacts to community facilities. DC Water would implement mitigation measures to minimize disruptions throughout the project area. Through construction scheduling, maintenance of traffic, and implementation of Traffic Control Plans (TCPs), DC Water would maintain access to homes and businesses during construction. Based on the temporary effects of construction on community facilities, community facilities and services is addressed in this EA.
2 ALTERNATIVES

2.1 Introduction

DC Water has considered a reasonable range of alternatives and options during planning for the NEBT. The components of the NEBT project as described in this chapter represent the outcome of preliminary engineering design and analysis as well as extensive collaboration between DC Water, the Program Consultants Organization, local government agencies, and community stakeholders. Alternatives and options were tested against the purpose and need and compatibility with future plans in DC Water’s LTCP (2002). Alternatives for the NEBT project are described in the ARP EA, the Mayor’s Task Force Report, and this EA.

This EA provides an assessment of the potential effects of the No Action Alternative and the recommended NEBT Alternative from the Mayor’s Task Force Report. Other engineering and non-engineering alternatives to the NEBT are summarized in this chapter, but were dismissed from detailed impact assessment because they either did not fulfill the project’s purpose and need, resulted in unacceptable impacts or costs, were not feasible due to constructability or other constraints, and/or were not compatible with future projects identified in the LTCP.

2.2 Alternative A – No Action Alternative

Alternative A, the No Action Alternative, represents a continuation of existing conditions in the Northeast Boundary sewershed. DC Water would continue regular maintenance of the existing combined system. Due to the limited capacity of the system, flooding would be expected to occur during heavy rain events. Studies of the existing system indicate that 2-year storm events are enough to cause flooding (2-year storm events are storms that have a 50 percent chance of occurring every year).

DC Water would continue to administer various mitigation programs in efforts to minimize the impacts of CSO flooding and improve water quality in the District. Existing mitigation activities include:

Backwater Valve Program: In flood-prone areas, DC Water offers a rebate to homeowners who install backwater valves. Backwater valves close the connection between homes and sewer systems during flood events, thereby preventing basement backups. The rebate covers 100 percent of the cost of the device and up to $6,000 dollars for installation through 2022.

Home Consultation: DC Water provides engineering consultation to homeowners in flood-prone areas. Consultation involves property inspection to identify possible causes of overland flooding, and recommendations to prevent future problems. Incentives are provided to homeowners through 2022 who choose to implement floodproofing work such as downspout connection or flood barrier installation.

Catch Basins: Over 25,000 catch basins in the District are regularly cleaned and maintained by DC Water. Catch basin cleaning results in removal of roughly 23 tons of debris daily.

Skimmer Boats: DC Water operates two skimmer boats that pick up trash floatables from the Potomac and Anacostia Rivers. The boats capture and remove roughly 400 tons of debris annually from surface waters.

Bayscaping/Pervious Pavers/Rain Barrel Programs: Financial incentives are available to homeowners who help to reduce runoff from their property through collection systems. The incentives are available through the District Department of Environment’s RiverSmart Homes initiative.
2.3 Alternative B – Northeast Boundary Tunnel (NEBT)

Under Alternative B, the NEBT and supporting infrastructure would be constructed to capture, store, and convey combined sewage to Blue Plains where it would be pumped out and treated to comply with DC Water’s NPDES Permit and Consent Decree. The proposed tunnel would be 23 feet in diameter, approximately 27,000 feet long, and would commence just south of Robert F. Kennedy (RFK) Stadium at DC Water’s CSO 019 north drop shaft and terminate just west of the intersection of Rhode Island Avenue, NW and 6th Street, NW as illustrated in Figure 2-1.

The NEBT would be located approximately 50 to 160 feet below the ground surface and constructed in geologic stratigraphy consisting of clays, sands, and decomposed bedrock (as depicted in Figure 2-2).

The entire length of the NEBT would be constructed using a tunnel boring machine (TBM) that simultaneously excavates and supports the ground with a permanent concrete tunnel lining. A rotating cutterhead at the front of the TBM is used to excavate the soil as powerful hydraulic cylinders jack the telescoping steel shell of the TBM forward. Openings into, and out of, the cutterhead control the rate of soil excavation that is conveyed to the surface for disposal. Figure 2-3 depicts DC Water’s “Lady Bird” TBM that is being used to construct the Blue Plains Tunnel as part of the ARPs.

Total construction cost of the NEBT project is estimated at over $500 million. Construction of the tunnel and supporting infrastructure would begin in 2017 and is tentatively scheduled to be completed in 2022.

Figure 2-4 illustrates the flood mitigation benefits of constructing the NEBT by showing the probability of a range of storms (from 1-year to 100-year) to occur in any given year before and after the project. The Northeast Boundary drainage area and many of its connections have the capacity to convey storms with return frequencies of approximately 2-years. A 2-year storm has a 50 percent chance to occur in any given year. Storms exceeding this return frequency can cause flooding in streets and properties. DC Water has established a standard requiring storm and combined sewers to be designed to convey the flow generated by a 15-year, 24-hour storm event. This is a storm that has a 7 percent chance to occur in any given year. The purpose of the project is to improve the capacity of the sewer system so it matches the current design standard for the system. This will greatly reduce the frequency of flooding. When storms larger than a 15-year 24-hour storm occur, the project will greatly mitigate the magnitude and duration of flooding.

A majority of the tunnel support infrastructure would be designed to relieve the existing sewers during storm events via diversion facilities. A typical diversion facility includes a diversion chamber, approach channel, drop shaft, and adit (depicted in Figure 2-5). The diversion chamber would direct flow from the existing combined sewer to the approach channel and drop shaft, which would then drop flow approximately 100 feet to be delivered to the NEBT via a short connecting tunnel or “adit.” These facilities would be sited along the existing trunk sewers and near chronic flood areas. Ultimately, all flow captured by the system would be conveyed to Blue Plains where it would be pumped out and treated to comply with DC Water’s NPDES Permit and the Federal Consent Decree.
Figure 2-1: Proposed Northeast Boundary Tunnel (NEBT) Alignment and Construction Staging Area Locations
2. Alternatives

Figure 2-2
Northeast Boundary Tunnel (NEBT) Profile

Figure 2-3: “Lady Bird” Tunnel Boring Machine
Figure 2-4: Current System Capacity and Capacity After Improvements

Figure 2-5: Graphic Illustration of Typical Diversion Facility
In addition to diversion facilities, Alternative B would also include ventilation control facilities and mobilization on work sites previously used for the construction of the ARPs. Figures 2-6 through 2-13 depict the estimated work limits associated with the NEBT project. The figures include symbology which is described in Table 2-1.

Proposed infrastructural components and construction activities at each CSA are described in the subsequent sections. Activities at the CSAs would require DC Water to coordinate with the District Department of Transportation to establish detours, lane closures, and traffic signal modifications. A detailed analysis of impacts to traffic and transportation is provided in Sections 3.12 and 4.13. The proposed actions would also result in impacts to the availability of street parking. Impacts to local parking and mitigative measures to maximize parking availability during construction are to be determined as the project progresses.

It is anticipated that the NEBT project would be required to comply with the District Department of Environment’s 2013 Stormwater Management Rule for detention and retention of stormwater. These rules are anticipated to require the construction of green infrastructure and other controls to mitigate stormwater runoff from the CSAs. As a result, green infrastructure and other stormwater controls will likely be required in the CSA and potentially at other offsite locations if construction of these measures is not feasible in the CSAs. The stormwater controls required by the District’s stormwater regulations are included in this EA, regardless of their location.

<table>
<thead>
<tr>
<th>Symbology</th>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>White dashed linetype</td>
<td>Existing DC Water Infrastructure</td>
<td>Existing structures, tunnels, watermains, sewers and facilities operated by DC Water.</td>
</tr>
<tr>
<td>Yellow dashed linetype</td>
<td>Proposed NEBT Infrastructure</td>
<td>Proposed infrastructure associated with the NEBT project including, but not limited to tunnels, diversion facilities and ventilation control facilities.</td>
</tr>
<tr>
<td>Royal blue dashed linetype</td>
<td>Zone of Influence</td>
<td>Ground settlement in the overlying wedge of soil above the TBM, known as the zone of influence, is controlled by maintaining a constant supporting pressure against the freshly excavated tunnel face. The supporting pressure is developed by regulating the amount of soil drawn into, and out of, the cutterhead. TBM design is a highly specialized field that has made significant advances over the last 30 years. State of the Art TBM design and practices have evolved to the point that ground settlements within the Influence Zone are often immeasurable. DC Water may elect to conduct pre- and post-construction surveys of structures that fall within this zone or perform ground improvements to minimize movement and ensure that structures are adequately protected. The zone of influence for the entire project area is provided on the detailed project maps in Appendix A.</td>
</tr>
<tr>
<td>Light blue shading</td>
<td>Temporary Access Areas</td>
<td>Temporary access outside of established CSAs is required to perform the following work associated with the NEBT project:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Installation and monitoring of geotechnical instrumentation equipment to monitor settlement and impacts of settlement of the ground and structures within the zone of influence of tunneling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Site surveying and minimally intrusive program to locate utilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ground modification to protect and minimize impacts to existing facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Utility protection and monitoring – excavation of portions of utilities for condition assessment and/or replacement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Other appurtenant work</td>
</tr>
<tr>
<td>Red shading</td>
<td>Construction Staging Areas (CSAs)</td>
<td>Physical locations where construction and storage of vehicles, equipment and materials would occur at the ground surface.</td>
</tr>
</tbody>
</table>
2.3.1 CSO 019 Construction Staging Area (CSO 019-CSA)

Figure 2-6 illustrates the construction limits associated with the CSO 019-CSA. At this site, DC Water has completed the construction of an overflow structure along the bank of the Anacostia River as part of the ARPs. In addition, DC Water is currently in the process of constructing two drop shafts and mining the Anacostia River Tunnel (ART) from this site. Impacts associated with these activities were addressed in the ARP EA. The CSO 019 north drop shaft would serve as the connection point between the NEBT and ART, and would serve as the mining shaft to construct the NEBT. During construction, the shaft would be used to lower the TBM, launch the TBM, and remove excavated materials associated with tunnel construction. The surrounding area would be used to store materials and equipment in support of tunneling operations.

Once the NEBT has been constructed, additional work would be carried out to complete and restore the area. Restoration would involve minor grading and the establishment of a meadow in accordance with National Park Service requirements. Temporary bulkheads associated with the ART and the CSO 019 overflow structure would be removed to place the NEBT system into operation. Additionally, DC Water would construct a permanent concrete cover on the north drop shaft and a high voltage electrical ductbank constructed under the ART project (required to power the TBMs) would be decommissioned and demolished.

2.3.2 Mt. Olivet Road, NE Construction Staging Area (MOR-CSA)

Figure 2-7 illustrates the construction limits associated with the MOR-CSA. At this CSA, a diversion chamber would be constructed within the westbound lanes of Mt. Olivet Road, NE between Capitol Avenue, NE and West Virginia Avenue, NE. The diversion chamber would be retrofitted to the 7-foot Ivy City trunk sewer line beneath Mt. Olivet Road, NE to offload flow from the pipe during storm events. In addition, stormwater inlets would be constructed along Mt. Olivet Road, NE to divert stormwater runoff from the low lying, flood-prone area near Capitol Avenue, NE to the diversion chamber. From the diversion chamber, a new diversion sewer would be constructed using trenchless methods. Trenchless construction at the MOR-CSA would involve the use of a medium size portable generator. The new diversion sewer would convey diverted combined sewer flow and stormwater to an approach channel and drop shaft located approximately 1,000 feet southeast along Mt. Olivet Road, NE. The adit connecting the drop shaft to the tunnel would be located within the adjacent Department of Public Works facility. In addition, a below-grade ventilation control facility would be constructed adjacent to the drop shaft to regulate tunnel air flows and mitigate fugitive odor emissions. The facility would include an odor control system and above-grade electrical cabinet to provide power.

Ground improvements are proposed to stabilize soils surrounding the proposed diversion sewer/approach channel and adit along Mt. Olivet Road, NE. DC Water anticipates that the project contractor would select from a number of commonly used methods to improve the ground based on site conditions. Once the ground improvements were complete, impacted ground surface areas would be restored and there would be no noticeable changes to the roadway or sidewalks.

During construction, temporary closure of Mt. Olivet Road, NE lanes would be required. Lane closures on West Virginia Avenue, NE and Capitol Avenue, NE would also be needed. Sidewalks along these roadways would be closed during construction and detours would be provided to maintain pedestrian access around the CSA. Following construction, disturbed areas would be returned to preconstruction conditions or enhanced by streetscaping.
2. Alternatives

Figure 2-6: CSO-019 Construction Staging Area (CSO 019-CSA) Construction Limits

Figure 2-6: CSO 019 Construction Staging Area (CSO 019-CSA) Construction Limits
Figure 2-7: Mount Olivet Road, NE Construction Limits

Mount Olivet Road Construction Staging Area (MOR-CSA) Construction Limits

Approximate limit of Zone of Influence
Temporary access areas
Proposed Studies
Existing Structures

LEGEND
2. Alternatives

2.3.3 W Street, NE Construction Staging Area (WS-CSA)

Figure 2-8 illustrates the construction limits associated with the WS-CSA. A junction shaft and above-ground ventilation control facility are proposed at the site, which is located within the Department of Public Works and District Department of Transportation facility adjacent to the Amtrak rail yard. The junction shaft would serve a dual purpose, both during and after construction. During construction the shaft would act as an access point providing maintenance access to the TBM. Ground improvements would be required around the junction shaft to allow the TBM to enter and exit the shaft.

When the tunnel system is fully operational, the shaft would serve to vent the tunnel system during storm events. A ventilation control facility would be constructed adjacent to the junction shaft and connected to the shaft by a ventilation channel. The ventilation control facility would be located above-ground and used to regulate air flow throughout the tunnel system. The ventilation control facility would also house an active odor control system to maintain a negative pressure on the tunnel and treat odorous air during dry weather conditions.

In order to construct the junction shaft and ventilation control facility, the existing site, which slopes moderately from the north to the south, would be graded to a flat surface. Grading the site would require a retaining wall to be constructed at the northern edge of the site in order to stabilize the forested area that buffers the Department of Public Works / District Department of Transportation facility from the residential properties located along W Street, NE. An access road actively used by Department of Public Works / District Department of Transportation staff exists along the southern edge of the site that would be relocated to the northern edge of the site adjacent to the proposed retaining wall to allow for the construction of the proposed facilities.

Once construction is complete, the newly graded site would be restored to preconstruction conditions or enhanced as agreed with the landowner.

2.3.4 Rhode Island Avenue, NE Construction Staging Area (RIA-CSA)

Figure 2-9 illustrates the construction limits associated with the RIA-CSA. At this CSA, a diversion chamber would be constructed along Rhode Island Avenue, NE. The diversion chamber would be retrofitted to an existing 6.5-foot combined sewer line beneath the roadway to offload flow from the pipe during storm events. Additionally, stormwater inlets would be constructed along Rhode Island Avenue, NE to divert stormwater runoff from the low lying, flood-prone area below the CSX and Washington Metropolitan Area Transit Authority rail line crossings. From the diversion chamber, an approach channel would convey combined sewer flows and captured stormwater runoff to a drop shaft and adit located along Rhode Island Avenue, NE.

Ground improvements are proposed to stabilize soils surrounding the proposed adit. DC Water anticipates that the project contractor would select from a number of commonly used methods to improve the ground based on site conditions. Once the ground improvements were complete, impacted ground surface areas would be restored and there would be no noticeable changes to the roadway or sidewalk.

During construction, temporary closure of the Rhode Island Avenue, NE lanes and 8th Place, NE lanes would be required. Sidewalks along the roadways would be closed during construction and detours would be provided to maintain pedestrian access around the CSA. Following construction, DC Water would restore disturbed areas to preconstruction conditions or enhance the areas by streetscaping.
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2. Alternatives

Figure 2-8: W Street, NE Construction Staging Area (WS-CSA) Construction Limits

Figure 2-8: W Street, NE Construction Staging Area (WS-CSA) Construction Limits
Figure 2-9
Rhode Island Avenue, NE Construction Staging Area (RIA-CSA) Construction Limits
2.3.5 4th Street, NE Construction Staging Area (4S-CSA)

Figure 2-10 illustrates the construction limits associated with the 4S-CSA. At this CSA, a diversion chamber would be constructed on 4th Street, NE just north of the intersection of Adams Street, NE. The diversion chamber would be retrofitted to the existing 6.5-foot combined sewer line below 4th Street, NE to offload flow from the pipe during storm events. Additionally, stormwater inlets would be constructed along Rhode Island Avenue, NE to divert stormwater runoff from the low lying, flood-prone area near the intersection of 5th Street, NE. From the diversion chamber, an approach channel would convey combined sewer flows to a drop shaft located at the intersection of 4th and Adams Streets, NE. Flows would be delivered from the shaft to the NEBT via an adit that connects to the tunnel at the intersection of 4th Street, NE and Rhode Island Avenue, NE.

Ground improvements are proposed to stabilize soils surrounding the proposed shaft and adit. DC Water anticipates that the project contractor would select from a number of commonly used methods to improve the ground based on site conditions. Once the ground improvements were complete, the impacted ground surface areas would be restored and there would be no noticeable changes to the roadways or sidewalks.

During construction, temporary closure of 4th Street, NE lanes would be required. Temporary closures on Adams Street, NE and Rhode Island Avenue, NE would also be needed. Sidewalks along these roadways would be closed during construction and detours would be provided to maintain pedestrian access around the CSA. Following construction, disturbed areas would be returned to preconstruction conditions or enhanced by streetscaping.

2.3.6 T Street, NW Construction Staging Area (TS-CSA)

Figure 2-11 illustrates the construction limits associated with the TS-CSA. Stormwater inlets are proposed that would be connected to a drop shaft located in a small grass area at the intersection of T Street, NW and Rhode Island Avenue, NW. The inlets are proposed to be positioned at the low point in the Bloomingdale/LeDroit Park area topography that has a natural tendency for flooding to occur during storm events. Flows would be delivered from the shaft to the NEBT via an adit that connects to the tunnel below the median of Rhode Island Avenue, NW.

Ground improvements are proposed to stabilize soils surrounding the proposed adit. DC Water anticipates that the project contractor would select from a number of commonly used methods to improve the ground based on site conditions. Once the ground improvements were complete, impacted ground surfaces would be restored and there would be no noticeable changes to the roadway or sidewalks.

During construction, temporary closure of T Street, NW lanes would be required, as well as temporary closures of Rhode Island Avenue, NW lanes. Sidewalks along T Street, NW and Rhode Island Avenue, NW would be closed during construction and detours would be provided to maintain pedestrian access around the CSA. Following construction, disturbed areas would be returned to preconstruction conditions or enhanced by streetscaping.
2. Alternatives

Figure 2-10: 4th Street, NE Construction Staging Area (4S-CSA) Construction Limits

LEGEND

EXISTING STRUCTURES
PROPOSED STRUCTURES
TEMPORARY ACCESS AREA
CONSTRUCTION STAGING AREA
APPROXIMATE LIMIT OF ZONE OF INFLUENCE

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Figure 2-11: T Street, NW and Pumping Station Construction Staging Area (TS-CSA & PS-CSA) Construction Limits

Legend:
- Approximate limit of Zone of Influence
- Construction Staging Area
- Temporary Access Area
- Proposed Studied
- Existing Structures
- 

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Environmental Assessment

2-15

Alternatives
2. Alternatives

2.3.7 Pumping Station Construction Staging Area (PS-CSA)

Figure 2-11 illustrates the construction limits associated with the PS-CSA. At this CSA, a pumping station associated with the First Street Tunnel would be decommissioned. Between the years of 2016 and 2022, the First Street Tunnel will temporarily store excess stormwater flows diverted from the Bloomingdale/LeDroit Park combined sewer system. Combined sewer flows will be stored during storm events and pumped from the tunnel during dry weather periods. Pumping will be conducted from the Thomas Street Pumping Station. When the NEBT is complete, connection with the First Street Tunnel will allow the captured flows to be conveyed to Blue Plains without the need for pumping. Work at the CSA would include the removal of all existing mechanical, electrical, and instrumentation equipment from the below-grade structures. Following the removal of equipment, the below-grade structures including the pumping station shaft and adjacent structures would be partially demolished and backfilled with suitable fill materials.

Alternately, the pumping station shaft could be used to divert stormwater flow from First Street, NW in order to reduce flooding at the intersection of T Street, NW and Rhode Island Avenue, NW. In this case, the existing pumping station shaft would be retrofitted to deliver captured stormwater from the street surface to the First Street Tunnel. Stormwater inlets would be constructed along First Street, NW to divert surface runoff to the shaft. Analysis to determine the need to divert stormwater flows from First Street, NW is ongoing.

During construction, temporary closure of Thomas Street, NW and First Street, NW lanes would be required. Temporary closure of Rhode Island Avenue, NW lanes would also be needed. Sidewalks along Thomas Street, NW and First Street, NW would be closed during construction and detours would be provided to maintain pedestrian access around the CSA. Final work at the site would include the restoration of disturbed areas to equal or better conditions as approved by the landowner.

2.3.8 Channing Street Mining Shaft Construction Staging Area (CS-CSA)

Figure 2-12 illustrates the construction limits associated with the CS-CSA. At this CSA, a ventilation control facility would be installed adjacent to the Channing Street Mining Shaft, originally constructed as part of the First Street Tunnel project. The ventilation control facility would be connected to the shaft and would regulate air flow throughout the NEBT and the First Street Tunnel. The facility would include an odor control system to mitigate fugitive odor emissions and an above-grade electrical cabinet to provide power. Additionally, modifications would be made within the Channing Street diversion chamber, originally constructed as part of the McMillan Stormwater Storage Project. The diversion chamber weir set points would be lowered to maximize the amount of flow to be diverted from the existing 72-inch combined sewer that runs north to south along First Street, NW. Ground disturbance is not anticipated to complete the modifications to the Channing Street diversion chamber; however, ground disturbance would be required to construct the ventilation control facility adjacent to the Channing Street Mining Shaft.

During construction, temporary closure of First Street, NW lanes would be required. Sidewalks along First Street, NW would be closed during construction and detours would be provided to maintain pedestrian access around the CSA. Following construction, disturbed areas would be returned to preconstruction conditions or enhanced by streetscaping.
Figure 2-12: Channing Street Mining Shaft Construction Staging Area (CS-CSA) Construction Limits
2. Alternatives

2.3.9 Florida Avenue, NW Construction Staging Area (FLA-CSA)

Figure 2-13 illustrates the construction limits associated with the FLA-CSA. At this CSA, a diversion chamber would be constructed on Florida Avenue, NW at the intersection of 3rd Street, NW. The diversion chamber would be retrofitted to the existing 6.5-foot by 9.75-foot Northeast Boundary Trunk Sewer below Florida Avenue, NW to offload flow from the combined sewer during storm events. An approach channel would convey captured combined sewer flows from the diversion chamber to a drop shaft located in 3rd Street, NW just north of Florida Avenue, NW. Flows would be delivered from the shaft to the NEBT via an adit that connects to the tunnel at the intersection of Rhode Island Avenue, NW.

Ground improvements are proposed to stabilize soils surrounding the proposed adit. DC Water anticipates that the project Contractor would select from a number of commonly used methods to improve the ground based on site and soil conditions. Once the ground improvements were complete, impacted ground surface areas would be restored and there would be no noticeable changes to the roadways or sidewalks.

The FLA-CSA would require temporary closure of 3rd Street, NW lanes as well as temporary closures of Florida Avenue, NW and S Street, NW lanes. Sidewalks along these roadways would be closed during construction and detours would be provided to maintain pedestrian access around the CSA. Following construction, disturbed areas would be returned to preconstruction conditions or enhanced by streetscaping.

2.3.10 R Street, NW Construction Staging Area (RS-CSA)

Figure 2-13 illustrates the construction limits associated with the RS-CSA, the upstream terminus of the NEBT. At this CSA a diversion chamber would be constructed along R Street, NW, at the intersection of 6th Street, NW. The diversion chamber would be retrofitted to an existing 8.5-foot combined sewer below R Street, NW to offload flow from the pipe during storm events. An approach channel would convey captured combined sewer flows from the diversion chamber to a drop shaft located at the intersection of Rhode Island Avenue, NW and 6th Street, NW. Flows would be delivered from the shaft directly to the NEBT. Additionally, a below-grade ventilation control facility would be installed adjacent to the drop shaft to regulate air flow throughout the tunnel system. The facility would include an odor control system to mitigate fugitive odor emissions and an above-grade electrical cabinet to provide power.

Ground improvements are proposed to stabilize soils within the CSA. DC Water anticipates that the project contractor would select from a number of commonly used methods to improve the ground based on site conditions. Once the ground improvements were complete, impacted ground surface areas would be restored and there would be no noticeable changes to the roadways or sidewalks.

During construction, temporary closure of R Street, NW lanes would be required. In addition, temporary closures of portions of southbound 6th Street, NW and eastbound Rhode Island Avenue, NW would be needed. Sidewalks along these roadways would be closed during construction and detours would be provided to maintain pedestrian access around the CSA. Following construction, DC Water would restore the area with new landscaping and pedestrian walkways, as approved by area stakeholders.
Figure 2-13: Florida Avenue, NW (right) & R Street, NW (left) Construction Staging Area (FLA-CSA & RS-CSA) Construction Limits
2. Alternatives

2.4 Construction Haul Routes and Work Hours

To support construction activity at the CSAs, several haul routes are proposed for truck and heavy construction traffic. The proposed routes coincide with the District Department of Transportation’s current “Truck and Bus Route System” Map dated May 7, 2010 and are described in the following sections.

2.4.1 CSO 019 Construction Staging Area (CSO 019-CSA) Haul Routes

Two haul routes are proposed for the CSO 019-CSA (Figure 2-14 and Figure 2-15):

- Southern: I-295 to the future Southeast Boulevard to Barney Circle and north along RFK Stadium Access Road to the CSO 019-CSA or I-295 to Pennsylvania Avenue to Barney Circle and north along RFK Stadium Access Road to the project site.

- Northern: I-295 to East Capital Street to the RFK Stadium Access Road to the project site.

2.4.2 Mount Olivet Road, NE Construction Staging Area (MOR-CSA) Haul Routes

At the MOR-CSA the inbound haul route would use New York Avenue, NE to Bladensburg Road, NE to both diversion sites along Mt. Olivet Road, NE. The outbound route would leave the site and continue east along West Virginia Avenue, NE to New York Avenue and I-295. MOR-CSA haul routes are shown in Figure 2-16.
2. Alternatives

Figure 2-15
Northern Haul Routes for the CSO 019 Construction Staging Area (CSO 019-CSA)

Figure 2-16
Haul Routes for the Mount Olivet Road, NE Construction Staging Area (MOR-CSA)
2. Alternatives

### 2.4.3 W Street, NE Construction Staging Area (WS-CSA) Haul Routes

The haul route inbound to the WS-CSA would course from New York Avenue, NE to 9th Street, NE to Brentwood Street, NE to V Street, NE to W Street, NE and the project site. Outbound construction traffic would follow the same route in reverse. Figure 2-17 depicts the haul route for the WS-CSA.

### 2.4.4 Rhode Island Avenue, NE Construction Staging Area (RIA-CSA) Haul Routes

Two inbound haul routes are proposed for the RIA-CSA that include:

- I-395 to New York Avenue, NW to North Capitol Street, NW to Rhode Island Avenue, NE and the project site.
- I-295 to New York Avenue, NE to Bladensburg Road, NE to Mt. Olivet Road, NE to 9th Street, NE to Brentwood Road, NE to Rhode Island Avenue, NE and the project site.

The outbound route would follow west along Rhode Island Avenue, NE to North Capitol Street, NW to New York Avenue, NW and I-395. Haul routes for the RIA-CSA are shown in Figure 2-18.

### 2.4.5 4th Street, NE Construction Staging Area (4S-CSA) Haul Routes

The haul route inbound to the 4S-CSA would follow New York Avenue, NW to North Capitol Street, NW to Michigan Avenue, NE to Franklin Street, NE and south on 4th Street, NE to the project site. The outbound route would follow south along 4th Street, NE to Rhode Island Avenue, NE to North Capitol Street, NW to New York Avenue, NW and I-395. Figure 2-19 depicts the haul route for the 4S-CSA.
2. Alternatives

Figure 2-18
Haul Routes for the Rhode Island Avenue, NE Construction Staging Area (RIA-CSA)

Figure 2-19
Haul Routes for the 4th Street, NE Construction Staging Area (4S-CSA)
2. Alternatives

2.4.6  T Street, NW, Pumping Station, Florida Avenue, NW and R Street, NW Construction Staging Areas (TS-CSA, PS-CSA, FLA-CSA and RS-CSA) Haul Routes

Haul routes associated with the TS-CSA, PS-CSA, FLA-CSA, and RS-CSA are illustrated in Figure 2-20. The inbound routes for these CSAs would direct construction traffic from I-395 to New York Avenue, NW to North Capitol Street, NW to Rhode Island Avenue, NW to the CSAs. The FLA-CSA outbound route would proceed south on Florida Avenue, NW to New York Avenue, NW and I-395. The TS-CSA, PS-CSA, and RS-CSA outbound routes would follow New Jersey Avenue, NW to New York Avenue, NW to I-395.

Work hours, haul hours, and the estimated construction traffic volume associated with the NEBT project are summarized in Table 2-2.

<table>
<thead>
<tr>
<th>Project Site</th>
<th>Work Hours</th>
<th>Haul Hours</th>
<th>Trucks per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSO 019-CSA</td>
<td>24 hours / day,</td>
<td>7:00 AM - 7:00 PM</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>7 days/ week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WS-CSA</td>
<td>7:00 AM - 7:00 PM</td>
<td>9:30 AM - 3:30 PM</td>
<td>12</td>
</tr>
<tr>
<td>RS-CSA</td>
<td>7:00 AM - 7:00 PM</td>
<td>9:30 AM - 3:30 PM</td>
<td>12</td>
</tr>
<tr>
<td>All other CSAs</td>
<td>7:00 AM - 7:00 PM</td>
<td>9:30 AM - 3:30 PM</td>
<td>7</td>
</tr>
</tbody>
</table>
2.5 Alternatives Considered but Dismissed

The following alternatives were considered by DC Water during project planning and conceptual design of the NEBT. These alternatives were dismissed due to inconsistency with the project purpose and need, onerous impacts resulting from the alternatives, engineering design or constructability limitations, and compatibility with future requirements of DC Water’s LTCP.

2.5.1 Original Northeast Boundary Tunnel (NEBT) Alignment

The original alignment of the NEBT as proposed in the 2009 Facility Plan and analyzed in detail in the ARP EA is shown on Figure 1-4. The original alignment involved the construction of a junction shaft in the vicinity of 9th Street, NE and New York Avenue, NE. Two tunnels were proposed to be constructed from the junction shaft, one extending to the west primarily along R Street, and the other would extend to the north following CSX and Washington Metropolitan Area Transit Authority rail lines. Under this alternative, tunnel construction would not occur along Rhode Island Avenue.

The original alignment was dismissed as a viable alternative for several reasons. During the evaluation conducted by the Mayor’s Task Force in 2012, hydraulic modeling indicated that moving the tunnel to the Rhode Island Avenue corridor would more effectively address chronic Northeast Boundary area flooding than the original alignment. The original alignment would also involve impacts to National Park Service properties, such as the National Arboretum, which could be avoided under the Rhode Island Avenue alternative. Additionally, the original alignment would require considerable work within private properties, which would make access for construction and long-term maintenance problematic. Finally, the original alignment would require a longer construction duration that would prolong the flood relief that is needed in the Northeast Boundary drainage area. Impacts associated with the original NEBT alignment are discussed in detail and analyzed in the ARP EA.
2. Alternatives

2.5.2 Dismissed Mount Olivet Road, NE Construction Staging Area (MOR-CSA) Alternative

Figure 2-21 illustrates an alternative to the proposed actions at the MOR-CSA. This alternative would include a diversion chamber along the westbound lanes of Mt. Olivet Road, NE. The diversion chamber would connect to a drop shaft located within the existing Department of Public Works parking lot. A junction chamber would be needed to make the connection which would be constructed within the Lewis Crowe Memorial Playground. The alternative layout was dismissed from consideration due to the following reasons:

- The junction chamber needed to convey flows from the diversion chamber to the drop shaft would result in permanent impacts to the Lewis Crowe Memorial Playground;
- The diversion sewer would cross below existing Department of Public Works structures that could potentially be affected by ground subsidence;
- The diversion sewer would be located beneath buildings. Where possible, DC Water avoids shallow sewer construction directly beneath buildings; and
- Infrastructure associated with the diversion facility would be located outside of the public right-of-way and would therefore complicate access for construction and long-term maintenance activities.
2.5.3 Dismissed W Street, NE Construction Area (WS-CSA) Alternative

Figure 2-22 illustrates an alternative to the proposed actions at the WS-CSA. DC Water considered an alternative site layout for the ventilation control facility proposed within District property, occupied by the Department of Public Works and the District Department of Transportation. Under this alternative layout, the proposed ventilation control facility would be sited at the north end of the site closer to W Street, NE. This alternative layout was dismissed from consideration due to the following reasons:

- Any noise generated by the ventilation control facility would be more perceptible to residents than if the facility was located at the southern end of the site;
- The height of the proposed structure would block existing southbound views from residences on W Street, NE; and
- Locating the ventilation control facility at the south end of the site, as in the preferred site layout, would provide greater potential for dispersion of vented air from the tunnel system.
2. Alternatives

2.5.4 Dismissed Rhode Island Avenue, NE Construction Staging Area (RIA-CSA) Alternatives

Figure 2-23 and Figure 2-24 illustrate alternatives to the proposed actions at the RIA-CSA. These two alternative site layouts primarily involve the diversion facility proposed along Rhode Island Avenue, NE. In an effort to reduce traffic impacts on the intersection of Rhode Island Avenue and Washington Place, NE / Reed Street, NE, construction to the west of the CSX / Washington Metropolitan Area Transit Authority railroad overpass was examined (Figure 2-23). This alternative layout was dismissed from consideration because hydraulic modeling indicated that the facility would not meet hydraulic goals of the project, meaning that flooding would still occur in this area after the diversion facility was constructed.

Figure 2-23: Dismissed Rhode Island Avenue Construction Staging Area (RIA-CSA) #1
A second alternative layout was considered (Figure 2-24) that included the construction of the diversion facility to the west of the Rhode Island Avenue, NE and 8th Place, NE intersection. This alternative layout proposed the construction of the drop shaft in a Washington Metropolitan Area Transit Authority owned paved lot adjacent to the CSX / Washington Metropolitan Area Transit Authority railroad crossing. This alternative layout was dismissed from additional study due to the location of the drop shaft. Grade differences in the area would further complicate construction, and the position of the railroad tracks relative to the proposed drop shaft location would present an unacceptable risk to the operation of the rail lines.
2. Alternatives

2.5.5 Dismissed 4th Street, NE Construction Staging Area (4S-CSA) Alternatives

Figure 2-25, Figure 2-26, and Figure 2-27 illustrate alternatives to the proposed actions at the 4S-CSA. Three alternative layouts were considered by DC Water for the diversion of combined sewer flows in this area. The first alternative proposed two diversion chambers, one on 4th Street, NE to the north of Rhode Island Avenue, NE, and one on 5th Street, NE to the south of Rhode Island Avenue, NE (Figure 2-25). Combined sewer flows from both diversion chambers would be diverted to a drop shaft and adit located at the intersection of 4th and W Streets, NE. This alternative layout was dismissed from consideration due to the following reasons:

- There would be additional construction impacts associated with constructing two diversion chambers, including but not limited to maintenance of traffic, utility relocations and mobilizing at multiple sites to accomplish the work;
- Complications associated with Fire Department access would occur due to work on 5th Street, NE; and
- The alternative would require additional means of construction to build the multiple shallow diversion sewers.

Figure 2-25: Dismissed 4th Street, NE Construction Staging Area (4S-CSA) Alternative #1
A second alternative site layout was considered that would involve the construction a diversion chamber, drop shaft and adit on the north side of Rhode Island Avenue, NE at the intersection of 5th Street, NE (Figure 2-26). Under this alternative layout, the drop shaft and diversion chamber would be located within a commercially developed area. There would be no construction on 4th Street, NE; however, the construction staging required under this alternative layout would restrict access to nearby commercial properties and would result in extensive lane closures along Rhode Island Avenue, NE. Also, diversion structures under this alternative layout would be constructed within private properties, which would present challenges associated with access for construction and long-term maintenance activities. For these reasons, this alternative layout was dismissed from further study.

![Figure 2-26: Dismissed 4th Street, NE Construction Staging Area (4S-CSA) Alternative #2](image-url)
A third alternative site layout was considered that would involve construction of a diversion chamber, drop shaft and adit at the intersection of Rhode Island Avenue, NE and 5th Street, NE (Figure 2-27). This alternative was dismissed for the following reasons:

- Construction staging would complicate ingress and egress at the District Fire Department at the corner of the intersection and potentially impact response times;
- Work in the intersection would restrict access and parking at adjacent commercial properties;
- Multiple iterations of utility relocations would be required to construct the diversion chamber in the intersection; and
- The construction staging area would have sizeable impacts on Rhode Island Avenue, NE traffic.

Figure 2-27
Dismissed 4th Street, NE Construction Staging Area (4S-CSA) Alternative #3
2.5.6 Dismissed T Street, NW Construction Staging Area (TS-CSA) Alternative

Figure 2-28 illustrates an alternative to the proposed actions at the TS-CSA. DC Water considered an alternative site layout that would construct a stormwater inlet on T Street, NW and a diversion sewer along the northern sidewalk and lanes of Rhode Island Avenue, NE. The diversion sewer would connect the stormwater inlet to the existing Pumping Station Shaft, constructed as part of the First Street Tunnel project. The alternative was dismissed from further study because it would require more extensive utility relocations and substantial traffic impacts than the proposed alternative.

Figure 2-28: Dismissed T Street, NW Construction Staging Area (TS-CSA) Alternative
2. Alternatives

2.5.7 Dismissed Florida Avenue, NW Construction Staging Area (FLA-CSA) Alternative

Figure 2-29 illustrates an alternative to the proposed actions at the FLA-CSA. DC Water examined an alternative site layout for the site that would construct a diversion chamber at the intersection of Florida Avenue, NW and New Jersey Avenue, NW. This alternative layout was dismissed because the configuration would require extensive road closures on Florida Avenue, NW, New Jersey Avenue, NW, Rhode Island Avenue, NW, and S Street, NW. Due to the location of the existing Northeast Boundary Trunk Sewer, maintenance of traffic on these roadways would be problematic. In addition, construction staging for this alternative layout would be required within private properties and would restrict parking at the post office.

2.5.8 Dismissed R Street, NW Construction Staging Area (RS-CSA) Alternative

Figure 2-29 also illustrates an alternative to the proposed actions at the RS-CSA. The alternative layout involves a different configuration of the proposed drop shaft. The drop shaft would be located in the eastbound lanes of Rhode Island Avenue, NW, between Marion Street and 6th Street, NW. Constructing the drop shaft at this location would require extensive lane closures on Rhode Island Avenue resulting in substantial impacts to traffic. This alternative layout was dismissed from additional study because DC Water would be able to effectively reduce traffic impacts on Rhode Island Avenue, NW by adjusting the tunnel alignment and drop shaft location as proposed under the Alternative B site layout.

Figure 2-29: Dismissed Florida Avenue, NW (right) & R Street, NW (left) Construction Staging Area (FLA-CSA & RS-CSA) Alternatives
2.6 Summary of Environmental Consequences of Alternatives Analyzed

A summary of the environmental consequences of each alternative is presented below in Table 2-3 and impact intensity levels (negligible, minor, moderate, and major) are defined in Chapter 4 on page 4-1.

**Table 2-3: Summary of Environmental Consequences by Resource Area**

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Alternative A – No Build</th>
<th>Alternative B – Northeast Boundary Tunnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soils and Topography</td>
<td>No impacts.</td>
<td>Short-term minor adverse impacts based on soil disturbance required at CSAs. Long-term minor adverse impacts based on proposed grading activities at the WS-CSA.</td>
</tr>
<tr>
<td>Groundwater and Hydrology</td>
<td>No impacts.</td>
<td>Short-term minor adverse impacts due to dewatering activities at the CSAs. Long-term negligible impacts due to increases in impervious land.</td>
</tr>
<tr>
<td>Water Quality</td>
<td>Short-term and long-term moderate to major adverse impacts resulting from CSO discharges to the Anacostia.</td>
<td>Short-term negligible impacts associated with dewatering and runoff from the CSAs. Long-term benefits from the reduction of CSOs to the Anacostia.</td>
</tr>
<tr>
<td>Air Quality</td>
<td>No impacts.</td>
<td>Short-term minor adverse impacts during construction from air emissions and dust. Long-term minor impacts to air quality following construction activities.</td>
</tr>
<tr>
<td>Noise and Vibration</td>
<td>No impacts.</td>
<td>Short-term moderate adverse noise impacts to sensitive receptors due to construction activities. Negligible long-term noise impacts due to operation of the ventilation control facilities. Short-term minor adverse vibration impacts at points along the alignment. No long-term vibration impacts.</td>
</tr>
<tr>
<td>Land Use and Zoning</td>
<td>No impacts.</td>
<td>Short-term and long-term changes to land use at the WS-CSA and no changes to land use designation. No changes to zoning.</td>
</tr>
<tr>
<td>Utilities and Infrastructure</td>
<td>Long-term moderate adverse impacts associated with flood damage to public and private property.</td>
<td>Short-term negligible impacts due to utility relocations. Long-term benefits from the reduction of CSO flooding.</td>
</tr>
<tr>
<td>Cultural / Historic Resources</td>
<td>Long-term minor adverse impacts associated with flood damage to historic buildings.</td>
<td>Short-term negligible to minor adverse impacts on historic resources due to potential effects of vibrations and visual intrusions. Long-term beneficial impacts from the reduction of CSO flooding.</td>
</tr>
<tr>
<td>Archaeological Resources</td>
<td>No impacts.</td>
<td>Short-term and long-term negligible to moderate adverse impacts at four areas of surface disturbance associated with proposed actions; notably, the RS-CSA and WS-CSA.</td>
</tr>
</tbody>
</table>
## 2. Alternatives

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Alternative A – No Build</th>
<th>Alternative B – Northeast Boundary Tunnel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human Health and Safety (including Hazardous Waste)</strong></td>
<td>Short-term and long-term moderate adverse impacts associated with health risks of combined sewer floods.</td>
<td>Short-term negligible to minor adverse impacts associated with construction activities. Short-term minor adverse impacts associated with contaminated soil and groundwater removal. Long-term moderate benefits from the reduction of CSO flooding.</td>
</tr>
<tr>
<td><strong>Transportation (Traffic)</strong></td>
<td>Long-term moderate adverse impacts due to the effects of CSO flooding on streets.</td>
<td>Short-term moderate adverse impacts due to temporary lane closures and restrictions, reduced parking, and increases in the amount of vehicles on area roads. Long-term minor benefits based on the mitigation of roadway flooding.</td>
</tr>
<tr>
<td><strong>Socioeconomics</strong></td>
<td>Long-term moderate adverse impacts associated with CSO flooding.</td>
<td>Short-term benefits associated with job creation and regional economic activity. Short-term minor adverse impacts to businesses and community facilities from temporary traffic impacts. Long-term benefits provided by the improvement of project area communities.</td>
</tr>
<tr>
<td><strong>Community Facilities and Services</strong></td>
<td>Long-term moderate adverse impacts associated with CSO flooding.</td>
<td>Short-term negligible to minor impacts associated with construction activities. Long-term benefits provided by the reduction of CSO flooding.</td>
</tr>
</tbody>
</table>