

3 AFFECTED ENVIRONMENT

In Chapter 3 of this EA, the NPS and WSSC identify the environmental resources potentially affected by the Preferred Alternative (Alternative 5A1-modified, with LOD reduction) and the no action alternative. This chapter defines the environmental resources and discusses their presence in relationship to the proposed Broad Creek WWPS Conveyance System Augmentation project. Separate discussions of the methods of study and impacts are presented in Chapter 4, Environmental Consequences. The area of analysis for each resource is defined within the appropriate section below and further elaborated on in Chapter 4. For most resources, the potential impact occurs only within the proposed LOD for construction within the NPS property (see Figures 3-1 through 3-4, which follow).

3.1 Soils

The study area lies entirely within the Atlantic Coastal Plain physiographic province. Soils in the Atlantic Coastal Plain consist of stratified sandy, silty, clayey, and loamy sediment that also contains lignitized material (peat/plant matter) and other carbonaceous (carbon-containing) materials, such as limestone/dolomite and coal, in some places (Kirby, 1967). Most of the soils formed in material weathered from these formations retain many of the particle size and mineralogy characteristics typical of the sediments. The Coastal Plain sediments also consist of artificial fill.

During a geotechnical survey performed for the feasibility study stage of project planning, artificial fill was encountered below the topsoil at the Broad Creek WWPS. The fill was composed of sands and varying amounts of clay, silt, and gravel with thin (two- to three-foot) intermittent layers of clay (WSSC, March 2011).

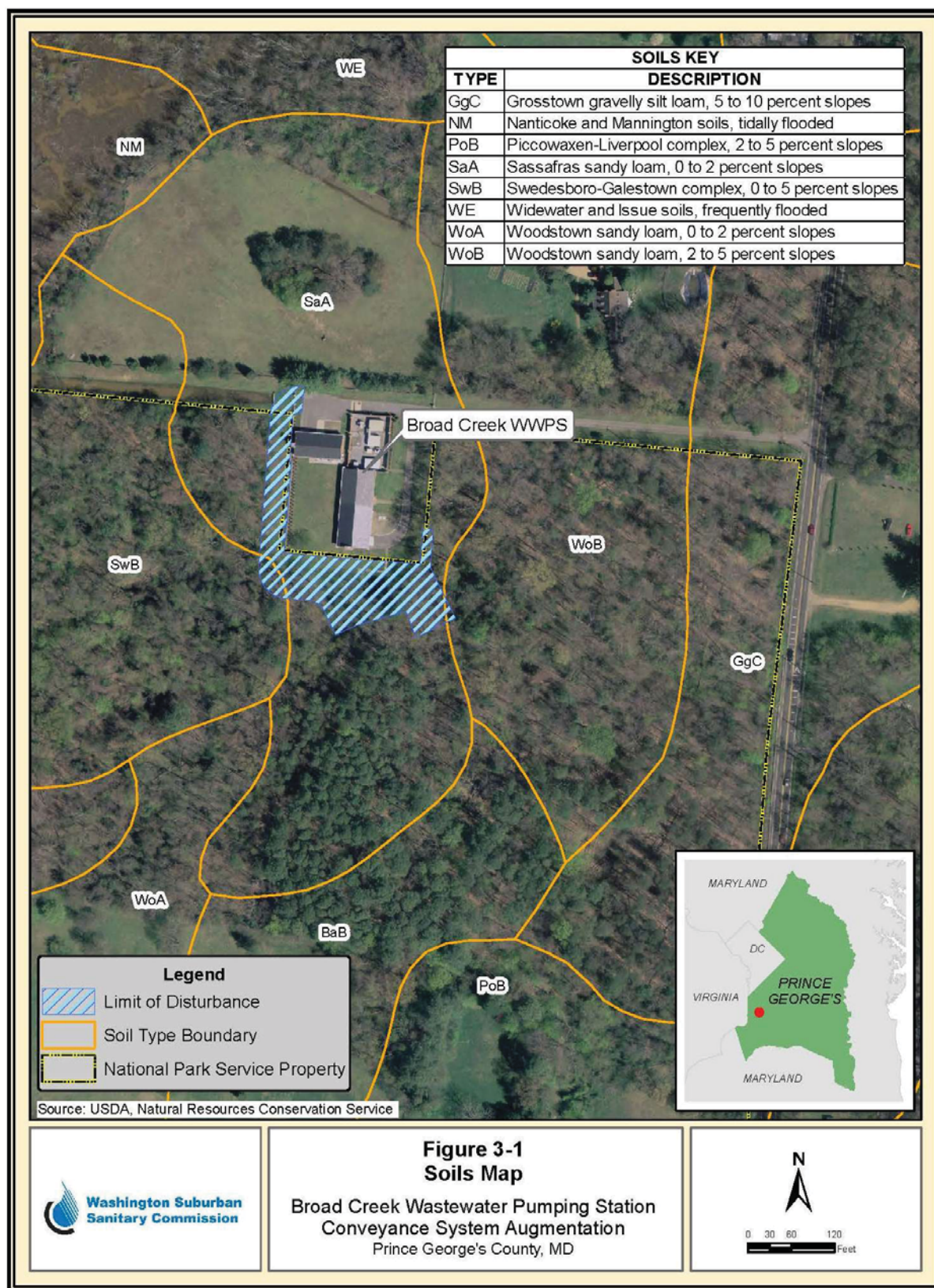
According to the U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Prince George's County Soil Survey (USDA, September 2011), the following three soil associations comprise the study area (see Figure 3-1).

- Sassafras sandy loam is a well-drained soil with a depth to water table of more than 80 inches and moderate to moderately slow permeability. Slopes range from zero to two percent. Approximately 94 percent of the study area contains this soil.
- Swedesboro-Galestown complex is a well-drained soil with a depth to water table of more than 80 inches and moderately rapid to very rapid permeability. Slopes range from zero to five percent. Approximately five percent of the study area contains this soil.
- Woodstown sandy loam is a moderately well-drained soil with a depth to water table of 20–40 inches and moderate permeability; it is considered hydric. Slopes range from two to five percent. Approximately one percent of the study area contains this soil.

No highly erodible soils are present within the study area (Kirby, 1967).

3.2 Water Quality

Section 510 of the CWA grants authority to the states to develop their own water quality standards, provided that they are at least as stringent as the federal standards. Section 13.4 of the EPA Water



Quality Standards (Standards), CFR Title 40, Part 131, assigns to states the responsibility for reviewing, developing, and revising water quality standards, subject to EPA approval and certification. Section 131.10 of the Standards mandates that each state (1) specify appropriate water uses to be achieved and protected and (2) classify each resource by use. Table 3-1 below lists water use categories for the State of Maryland.

Table 3-1: Surface Water Quality Use Category Criteria

Use Category	Designated Uses
I	Water contact recreation, and protection of nontidal warmwater aquatic life
II	Support of estuarine and marine aquatic life and shellfish harvesting
III	Nontidal cold water
IV	Recreational trout water

Source: MDE, December 2011.

In accordance with the CWA, states and territories are to identify and list specific waterways in which water quality is impaired or threatened by pollutants (MDE, December 2011). This requirement is found under section 303(d), and the list of impaired waters is often referred to as the “303(d) list.” Broad Creek and the Potomac River in this river segment are identified on the list of impaired waters.

The Broad Creek WWPS is located close to the geographic middle of the Middle Potomac-Anacostia-Occoquan watershed [Hydrologic Unit Code(HUC 8) ID: 02070010] which encompasses about 1,300 square miles (EPA, November 2011) and directly drains portions of the District of Columbia, Virginia, and Maryland. Since 1995, the most common pollutants causing degradation were fecal coliform, total nitrogen, total phosphorus, and total suspended solids (TSS) (MDE, May 2011). Fish consumption advisories in this reach of the Potomac River are most often related to mercury and polychlorinated biphenyl (PCB) contamination (MDE, September 2011).

MDE further delineates the subwatershed containing the Broad Creek WWPS, the Upper Tidal Potomac River Upper Tidal subwatershed (ID 02140201), within the federally identified Middle Potomac-Anacostia-Occoquan watershed. This smaller geographical area encompasses about 43.4 square miles, over half of which is characterized as urban development (MDNR, December 2011). The subwatershed (ID 02140201) is listed as: impaired for fishing due to PCBs present in fish tissue; impaired for aquatic life and wildlife due to undefined causes; in attainment for some standards, but with insufficient data to assess completely for degradation for aquatic life and wildlife due to copper; and in attainment for some standards, but with insufficient data to assess completely for degradation for fishing due to mercury present in fish tissue (MDE, September 2011). The MDNR (December 2011E) rates the overall health of the subwatershed as poor.

The Broad Creek WWPS has a history of untreated SSO to Broad Creek during extreme rain events due to inadequate pumping station capacity. Between 2006 and 2012, the Broad Creek WWPS had a total of nine SSO events exceeding 10,000 gallons. The largest event occurred in June 2006, when heavy rains and a power failure resulted in an SSO of 6.2 million gallons. In 2011, the Broad Creek WWPS had three SSOs with a combined total of at least 5.2 million gallons (Gazette, December

2011). In 2010, WSSC analyzed 30 water samples in the Potomac River watershed for the presence of *Escherichia coli* (*E. coli*) bacteria, an indicator of degraded water quality due to fecal contamination. WSSC found that Broad Creek, in the area downstream of the Broad Creek WWPS, had the highest fecal bacteria count of any of the 30 sampling stations in the watershed (WSSC, August 2010B).

3.3 Hydrology

Waters of the United States are defined by the USACE as “coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including their adjacent wetlands, and tributaries to navigable waters of the United States, including adjacent wetlands”

(Environmental Laboratory, January 1987). Waters of the United States are protected under

Section 404 of the CWA and Section 10 of the *Rivers and Harbors Appropriations Act of 1899*, which require that a USACE permit be issued for activities that result in the discharge of dredge or fill material into wetlands and waterways. For purposes of this EA, the term “waterway” is synonymous with Waters of the United States, and is defined as any one of the surface water bodies present on or adjacent to the NPS Harmony Hall property, whether intermittent or perennial; whether riverine or tidal; because all of those waterways have surface hydrology.

As explained in Section 3.2, the (upper tidal) Potomac River is about one mile west of the pumping station, whereas the tidally influenced Broad Creek inlet and marsh are about 1/8 mile west of the Broad Creek WWPS.

The Potomac River Upper Tidal subwatershed contains five mapped upland water features: Broad Creek (also known as Henson Creek) and four unnamed tributaries, all of which drain directly to the Broad Creek inlet. Although geographically in closer proximity to the Broad Creek upland waters than any of the unnamed tributaries, the Broad Creek WWPS site drains directly to the Broad Creek estuary and inlet via a dendritic network of wetlands and gullies.

Based on the U.S. Geological Survey (USGS) 7.5-minute topographic and MERLIN online natural resources geographic database maintained by the MDNR, NPS and WSSC determined that the closest named water body is the Broad Creek marsh, about 1/8 mile northwest of the project site (MDNR, December 2011C). To determine the presence of smaller unnamed waterways not identified by online resources, the NPS and WSSC performed a field delineation. The findings of this



Photo 1: Intermittent Unnamed Tributary to Broad Creek identified during field investigation South of Broad Creek WWPS

study identified an intermittent stream (unnamed tributary to Broad Creek) flowing roughly east to west, about 80 feet south of the Broad Creek WWPS. The stream, in the vicinity of the Broad Creek WWPS, is about four feet wide with a channel depth of four to six inches from the top of the bank. The stream has stable vegetated banks with a sand and silt substrate and a densely vegetated riparian corridor. Stream observations indicated that the water was clear. Water staining, disturbed leaf litter, a wrack line, and litter and debris marked the high water level.

Although not a Water of the US or a waterway, there is also a manmade SSO overflow channel, located at the northwest corner of the Broad Creek WWPS, which flows westward roughly in the same direction as the access driveway from Livingston Road.

3.4 Wetlands

Wetlands are important because they provide unique habitat conducive to species diversity; floodflow attenuation; contaminant filtering of surface waters; and recreational, economic, and other societal values.

The USACE and EPA define wetlands as “areas that are saturated by surface or groundwater at a frequency and

duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands typically include swamps, marshes, bogs, vernal pools, and similar areas (Environmental Laboratory, January 1987). Wetlands are protected under Section 404 of the CWA, which requires that a USACE permit be issued for activities that result in the discharge of dredge or fill material into wetlands and waterways.

EO 11990, Protection of Wetlands, further defines impacts to wetlands to include indirect impacts, provides a long-term goal of “no net loss of wetlands,” and requires federal agencies to adopt procedures that ensure compliance with EO 11990. To achieve these objectives, EO 11990 directs the NPS to (1) provide leadership and take action to minimize the destruction, loss, or degradation of wetlands; (2) preserve and enhance the natural and beneficial values of wetlands; and (3) avoid direct or indirect support of new construction in wetlands, unless there are no practicable alternatives to such construction and the proposed action includes all practicable measures to minimize harm to wetlands.



Photo 2: Field Delineated Wetland South of Proposed Project Site

The *National Park Service Procedural Manual #77-1: Wetland Protection*, contains the framework for the NPS to meet its responsibilities under EO 11990 and establishes NPS's longer-term goal of achieving a net gain of wetlands on lands managed by the NPS. DO #77-1 outlines NPS's policies and procedures for the avoidance and minimization of impacts to wetlands, as well as preferred mitigation measures to compensate for unavoidable impacts to wetlands. Specifically, for proposed new development or other new activities that are either located in or otherwise have the potential for direct or indirect adverse impacts to wetlands, the NPS would employ a sequence of (1) avoiding adverse wetland impacts to the extent practicable, (2) minimizing impacts that could not be avoided, and (3) compensating for remaining unavoidable adverse wetland impacts via restoration of degraded wetlands.

For this EA, NPS and WSSC examined background information as an initial step to identify wetland habitat previously mapped by the U.S. Department of the Interior, National Wetland Inventory (NWI) and the Maryland Environmental Resources and Land Information Network (MERLIN). As shown in Figure 3-2, the closest wetland identified by the NWI and MERLIN is a 90 acre freshwater forested (PFO1R) wetland, about 350 feet north and west of the Broad Creek WWPS. To determine the presence of wetlands not identified by online resources, the NPS and WSSC performed a field delineation using the USACE 1987 guidance, the Coastal Plain supplement, and the Cowardin method outlined in the *National Park Service Procedural Manual #77-1* to identify unmapped wetlands. Based on this study, NPS/WSSC found a 3.53-acre wetland adjacent to the Broad Creek WWPS to the east and south (see Appendix C: Wetland Field Delineation Plates). The wetland complex is a palustrine forested, broad-leaved deciduous, temporarily-flooded wetland (PFO1A) and a needle-leaved evergreen, temporarily-flooded wetland (PFO4A). Portions of the wetland are characterized as an abandoned pine plantation transitioning into a mixed deciduous forest. Dominant tree species in the wetland include pin oak (*Quercus palustris*), red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), and loblolly pine (*Pinus taeda*).

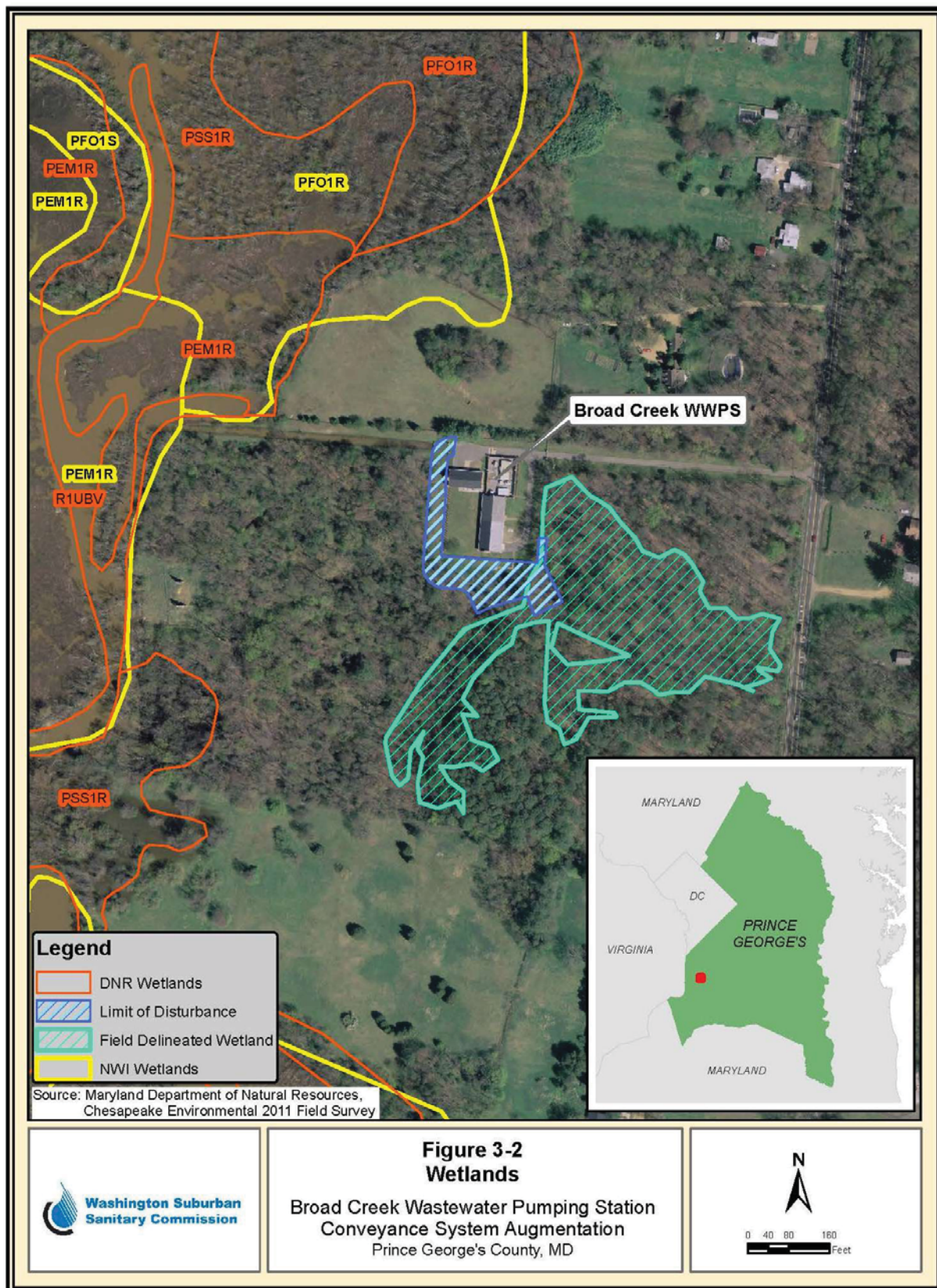
The NPS and WSSC performed a functions and values assessment of the wetland and incorporated the following primary factors:

- The wetland's geographic position near the downgradient extent of the subwatershed
- The presence of an intermittent stream in the wetland
- The proximity of the floodplain, open water habitat, and large forested tracts
- The presence of historic properties nearby and the nature of the Broad Creek WWPS
- NPS ownership of the property

Based on these factors and others, the wetland is suitable for the following functions:

- Groundwater recharge and discharge
- Floodflow alteration
- Sediment retention
- Nutrient removal
- Production export (producing materials that are valuable to humans or other organisms)
- Wildlife habitat
- Uniqueness or heritage

Although suitable for these functions and values, the principal functions and values for the wetland are assessed as floodflow alteration, sediment retention, and uniqueness and heritage.



3.5 Floodplains and Coastal Zone

3.5.1 Floodplains

EO 11988, Floodplain Management, requires federal agencies to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains. Specifically, the EO prohibits federal agencies from funding construction in the 100-year floodplain, unless no practicable alternatives exist. The *National Park Service Procedural Manual #77-2: Floodplain Management*, contains the framework for the NPS to meet its responsibilities under EO 11988, and the procedures for implementing floodplain protection and management actions in units of the National Park System as required by EO 11988, Floodplain Management, and DO #77-2, Floodplain Management.

As indicated on the Federal Emergency Management Agency (FEMA) flood insurance rate map (FIRM) for the project area (Panel 245208 0075 D, effective September 6, 1996), the Broad Creek WWPS is on the fringe of the 100-year floodplain, predominantly in a shaded Zone B, an area of moderate flood hazard usually between the limit of the 100- and 500-year floodplains [see Figure 3-3: 100-year Floodplain (FEMA, September 1996)]. The source of flooding in the project area is backwater from the Potomac River and floodwaters from Broad Creek. According to the FIRM, the base flood elevation (BFE) is 10 feet above mean sea level (amsl) in the project area.

According to a survey performed during the feasibility study stage of project planning, all of the structural improvements at the Broad Creek WWPS are elevated on fill to at least 10 feet amsl. Elevations slope downward below the BFE to the north, east, and south of the Broad Creek WWPS. During 100-year flood events, flood depths are estimated to be between one and two feet deep adjacent to the Broad Creek WWPS, based on topographic contours. In the vicinity of the project site, the



Photo 3: Broad Creek in the Vicinity of the Broad Creek WWPS, with a View of Broad Creek Marsh in the Background

floodplain is maintained as forested green space. Flood velocities are expected to be low in the floodplain fringe. The floodplain in this location stretches contiguously from the Broad Creek WWPS over 2.5 miles west across the Potomac River to Virginia.



3.5.2 Coastal Zone Resources

The *Coastal Zone Management Act* (CZMA), overseen at the federal level by the National Oceanic and Atmospheric Administration (NOAA) Office of Ocean and Coastal Resource Management, provides for management of the nation's coastal resources while meeting the challenge of continued growth in the coastal zone. In Maryland, the CZMA is administered at the state level by the MDNR Coastal Zone Management Division, which maintains and updates the enforceable policies applicable to the coastal zone, including Maryland's *Critical Area Act*.

The Chesapeake Bay Critical Area in Maryland is defined as all land within 1,000 feet of the mean high water line of tidal waters, or the landward edge of tidal wetlands, and all waters of and lands within the Chesapeake Bay drainage basin and its tributaries. The Critical Area Buffer is the land immediately adjacent to tidal waters, tidal wetlands, and tributary streams. The buffer has a minimum width of 100 feet, but can be wider if in proximity to wetlands, steep slopes, or sensitive soils. Activities such as construction, tree removal, and land disturbance are typically prohibited in the Critical Area Buffer.

In Maryland, Prince George's County is considered to be in the coastal zone (MDNR, December 2011B). The Broad Creek WWPS is in the CZMA, and is within 1,000 feet of the tidal Broad Creek inlet and therefore within the Chesapeake Bay Critical Area. However, the Broad Creek WWPS is more than 100 feet from tidal waters, tidal wetlands, and tributary streams, and therefore outside of the Critical Area Buffer. According to the MDNR's MERLIN, Broad Creek WWPS is in a Critical Area Resource Conservation Area, in which new commercial, industrial, and institutional land uses are generally prohibited (MDNR, December 2011C). In the vicinity of the Broad Creek WWPS, the coastal zone and critical area is maintained as forested green space. Consultation with the Critical Area Commission (CAC) is required for the project, and coordination has been initiated. Discussion of the consultation is contained in Chapter 5 (Agency Consultation and Coordination) of this EA. In a letter dated November 29, 2011, the CAC determined that the project qualifies under state general programs regulations and a Memorandum of Understanding dated June 9, 2003 applies, meaning no further consultation is needed and that the CAC did not require specific mitigation provisions. A copy of the correspondence is in Appendix H (Critical Area Commission CZMA Coordination).

3.6 Wildlife and Wildlife Habitat

3.6.1 Terrestrial Wildlife and Habitat

The Broad Creek WWPS is located in the Atlantic Coastal Plain physiographic province, which is characterized as a region of relatively flat, low-lying landscape on generally deep, sandy, unconsolidated soils. Forests of the precolonial era were probably combinations of oak-hickory, oak-gum, and oak-pine composition, and the region had exceptionally diverse wetland habitats. Contemporary forests consist primarily of successional or silvicultural stands of loblolly pine. Wetland and floodplain forests in the Atlantic Coastal Plain are typically described as elm-ash-red maple in composition (MDNR, September 2005).

The terrestrial environment in the vicinity of the Broad Creek WWPS, as defined by its subwatershed, is characterized as about 50 percent urban development, 40 percent forested, seven percent agricultural use, and three percent wetlands or barren area. Impervious surface accounts for about 19 percent of the terrestrial environment in the vicinity of the Broad Creek WWPS (MDNR, December 2011A). Most of the forested areas lie along stream valley corridors or are located nearly contiguous to the project area to the north or the east.

In the urbanized context of the surrounding environment, the Broad Creek WWPS is in a relatively natural area with a variety of nearby habitats, including the marsh and shallow tidal inlet associated with Broad Creek and large tracts of contiguous forest to the north and east. Forest interior dwelling species (FIDS) habitat—defined as habitat that is buffered from forest edge by at least 300 feet—is probably precluded from the site as a result of cleared agricultural land and parkland to the north and south and Livingston Road to the east. However, FIDS habitat is probably present about 1,000 feet to the north of the Broad Creek WWPS at the confluence of Broad Creek with the Broad Creek inlet and about 1,500 feet east of the Broad Creek WWPS in a large forested tract east of Livingston Road. As such, transient use of the forest by FIDS is probable given its proximity to the Broad Creek inlet and marsh. The forested area surrounding the Broad Creek WWPS is identified by MERLIN as part of a green infrastructure corridor, a natural linear feature acting as a migratory connector to larger natural areas (MDNR, December 2011C).

Typical resident terrestrial wildlife expected to be present in the vicinity of the Broad Creek WWPS include species adapted to urban environments, such as: white-tailed deer (*Odocoileus virginianus*), Eastern raccoon (*Procyon lotor lotor*), gray and Eastern fox squirrel (*Sciurus carolinensis* and *Sciurus niger*), Virginia opossum (*Dedelphis virginiana*), and striped skunk (*Mephitis mephitis*).

3.6.2 Aquatic Wildlife and Habitat

The closest natural aquatic environment is associated with Broad Creek about 350 feet west of the project site. As indicated in consultation with the NOAA NMFS dated June 14, 2010 (see Appendix F, Natural Resources Agency Coordination), aquatic species thought to use Broad Creek and its inlet include migratory species such as alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), white perch (*Marone americana*), and yellow perch (*Perca flavescens*), as well as resident species such as catfish (*Ictalurus* sp.), sunfish species (family *Centrarchidae*), bluegill (*Lepomis macrochirus*), American eel (*Anguilla rostrata*), and dace species [family *Cyprinidae* (MDNR, December 2011D)].

The intermittent stream just south of the Broad Creek WWPS does not contain any year-round aquatic habitat, but may support some seasonal amphibious species.

The only other aquatic habitat in proximity to the Broad Creek WWPS is a stormwater overflow channel, which is tidally influenced but only discharges during extreme storm events. Although



Photo 4: Stormwater Overflow Channel

characterized as poor aquatic habitat due to expected poor water quality and lack of riparian cover and in-stream features, minnow species were observed inhabiting the standing water in the culvert and a small drop pool at the culvert outfall.

3.7 Vegetation

Vegetation. The NPS and WSSC characterized the forest on NPS property east, west, and south of the Broad Creek WWPS. Three distinct forest types are found in the project area: loblolly pine (*Pinus taeda*) dominated stands; red maple (*Acer rubrum*) dominated stands; and green ash (*Fraxinus pennsylvannica*) dominated stands. These forest types are common to the Atlantic Coastal Plain. Other forest canopy species identified in the project area include pin oak (*Quercus pulustris*), American sycamore (*Platanus occidentalis*), American elm (*Ulmus Americana*), and sweetgum (*Liquidambar styraciflua*). The understory includes additional species, such as American holly (*Ilex opaca*), boxelder (*Acer negundo*), blackhaw (*Viburnum prunifolium*), and eastern red cedar (*Juniperus virginiana*). The understory is dominated by nonnative invasive species, including Japanese stilt grass (*Microstegium vimineum*), Japanese knotweed (*Fallopia japonica*), and Japanese honeysuckle (*Lonicera japonica*). A complete list of species identified at the site is included in Appendix E (List of Plant Species Found in the Project Area).

Directly adjacent to the Broad Creek WWPS, the forest edge is characterized by a pioneer forest stand colonizing the disturbed area around the pump station. A tree inventory completed for this area characterized the forest composition as predominately green ash (39 percent), red maple (17 percent), and eastern red cedar (14 percent). The average diameter at breast height of the trees in this area is 6.6 inches.

Invasive Species. The herbaceous layer of the forest adjacent to the Broad Creek WWPS is dominated by nonnative invasive species that are common to the mid-Atlantic region: Japanese stilt grass, Japanese knotweed, and Japanese honeysuckle. Herbaceous layer coverage by nonnative invasive species is almost 100 percent. Nonnative invasive species were not observed in other forest canopy classes.

3.8 Protected Species and Habitat

3.8.1 Bald and Golden Eagles

The bald eagle was removed from the list of threatened and endangered species on August 8, 2007. The bald eagle is still protected under the BGPA (or Eagle Act) and the MBTA. The study area is outside of the typical range of the golden eagle, but within the typical range of the bald eagle. The Eagle Act makes it illegal to take (kill, wound, pursue, shoot, shoot at, poison, capture, trap, collect, molest, or disturb) bald eagles. To “disturb” is defined in the Eagle Act as “to agitate or bother to a degree that caused, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

According to MERLIN, the Broad Creek WWPS is about 1,650 feet from one bald eagle nest, and about 1,300 feet from a second bald eagle nest (MDNR, December 2011C). Although the NPS did not field-verify exact distances between the nest sites and the Broad Creek WWPS, a bald eagle was observed in the Broad Creek inlet by WSSC study teams in January 2012. The USFWS guidance on

bald eagle management, *The National Bald Eagle Management Guidelines*, recommends that disturbance of nesting bald eagles be avoided by: (1) keeping a distance between the activity and the nest (distance buffers); (2) maintaining natural, preferably forested, areas between the activity and nest trees (landscape buffers); and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites (USFWS, May 2007). Because avoidance of effects to resident and transient Bald eagles is possible, there would be no impacts to bald eagles, and the subject does not appear in Chapter 4.

3.8.2 Migratory Birds

The MBTA establishes provisions for the protection of migratory birds. The MBTA forbids anyone “at any time, by any means, or in any manner, to pursue, hunt take, capture, kill or sell any part, nest, or eggs of any such bird” (16 USC § 703(a)). The MBTA differs from the ESA in that it protects over 1,000 migratory bird species that are not necessarily threatened or endangered. Knowledge or intent is not required to be liable under the MBTA. Although USFWS implements and enforces the MBTA, there is no provision for the issuance of permits authorizing incidental take.

During field investigations, no migratory birds were specifically identified during a site visit to the project area on December 20, 2011. However, the NPS and WSSC expect that a variety of migratory birds—including sparrows, warblers, and juncos—use the project area at least on a seasonal basis. No protocol surveys for birds were conducted during the site visit. Because construction activity and tree clearing can be sequenced to preclude impacts to migratory birds, there would be no impacts to migratory birds, and the subject does not appear in Chapter 4.

3.9 Cultural Resources

The Broad Creek WWPS is located in an area that was favorable for aboriginal settlement and an area that was also later settled by Europeans beginning in the mid-17th century. Situated above a natural harbor at Broad Creek, the area was a coveted location by early European settlers. Later, the study area was part of the colonial port town of Aire, one of six towns established by the Maryland General Assembly in Prince George’s County as a tobacco port in 1706. While it is unclear if Aire (later called Broad Creek) ever developed into a sizeable town, the mansions Want Water and Battersea [later Harmony Hall (Fitzgerald and Scott, November 1979)] were constructed in the study area in the early 18th century. Saint John’s parish has been located north of the study area since the late 17th century (Dowling, February 1998), and the current historic church (the fourth building on the site) was constructed in 1767–1768. The village of Silesia, located nearby, contains contributing elements to the Broad Creek Historic District; as does the Harmony Hall property.

WSSC and the NPS obtained information on historic sites, districts, landscapes, and archeological sites from the Maryland Historical Trust (MHT) Library and the Phase I archeological investigation completed for this project (Tyler and Ward, June 2011). The areas of potential effects (APEs) for both archeological and architectural resources and the locations of historic properties are shown in Figure 3-4 (Historic Structures and Districts). Archeological site locations are confidential and are not shown in the figure.

As discussed in Chapter 1, subsection 1.8.3 (Cultural Resources—Museum Collections, and Ethnography and American Indian Traditional Cultural Properties), the NPS and WSSC determined that there would be no potential for impacts to museum collections or to ethnography including

American Indian Traditional Cultural Properties. Therefore, those subjects are not addressed in further detail in this section.

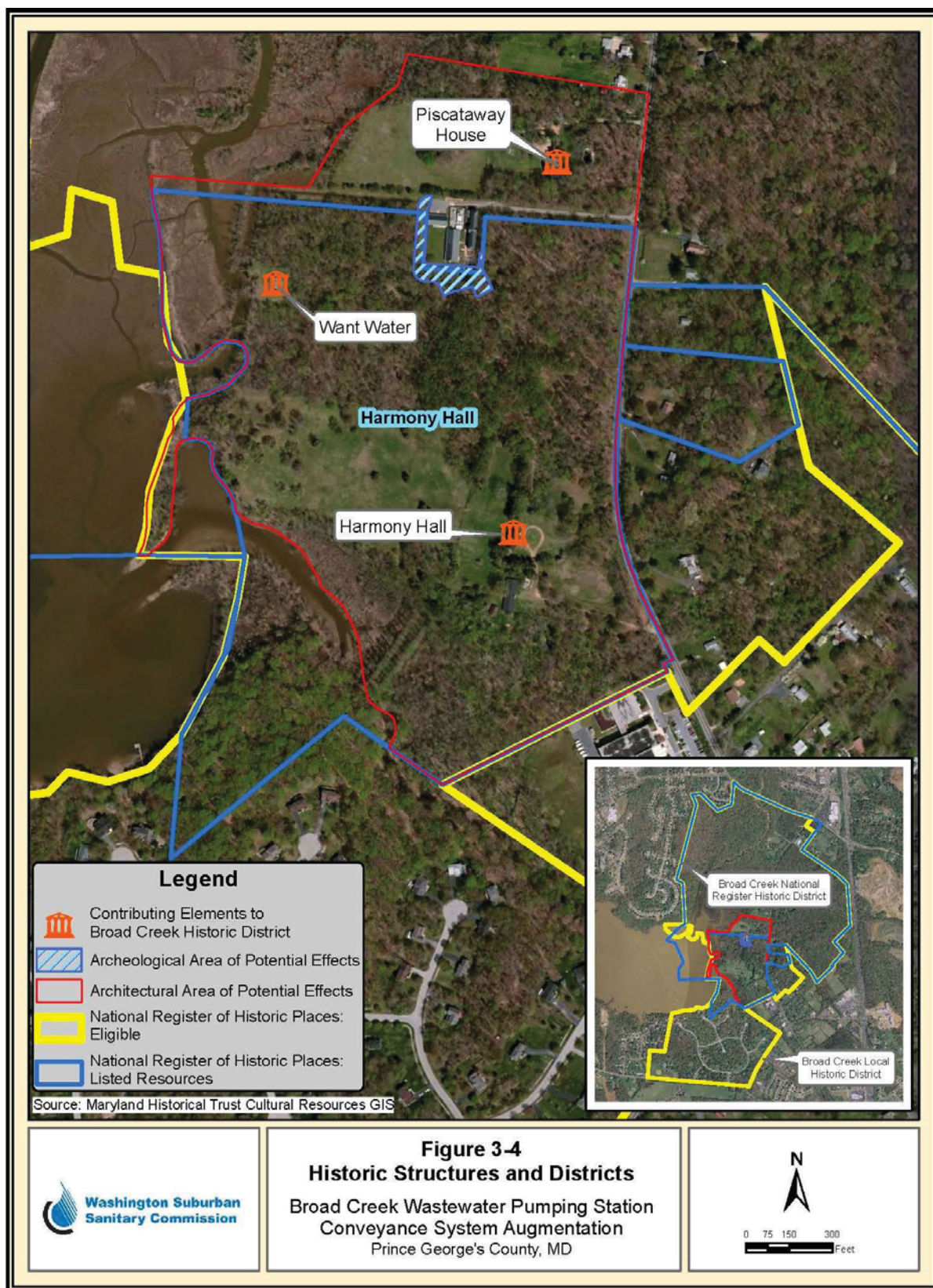
3.9.1 Archeology

WSSC archeologists completed a Phase I archeological investigation in June 2011 within the immediate area of the Broad Creek WWPS (Tyler and Ward, June 2011). Additional archeological consideration of the microtunnel alignments was undertaken in December 2011 by a qualified archeologist.

As a result of this background research, archeological resources have been identified in the vicinity of the study area along the Potomac River and its tributaries. Within the archeological APE, the Phase I archeological investigation study completed for this project identified one archeological site, the Broad Creek Wastewater Site (18PR1023), a historic archeological site. The site encompasses a light scatter of historic artifacts, primarily dating to the first half of the 19th century, recovered from the historic plowzone (Tyler and Ward, June 2011). The artifacts appeared to have been secondarily deposited via runoff from the surrounding landscape, and were located in disturbed soils. The site (18PR1023) is not considered to be historically significant or eligible for the NRHP because it is unlikely that the site can provide information regarding the lifeways of historic occupants of the area.

WSSC's and NPS's review of the geotechnical report (T.L.B. Associates, March 2011) indicates that only culturally sterile soils would be encountered at depths typical of microtunneling in this topography (20 feet or more in depth).

Coordination between the NPS and the State Historic Preservation Office [SHPO (a process known as a Section 106 review)] was initiated in August 2010. On October 20, 2010, MHT concurred that the project would have no adverse effects on historic properties. The NPS reinitiated Section 106 with MHT in March 2012 to share the results of the archeological investigations completed in 2011 and the results of the assessment of archeological potential along the sewer microtunneling alignment completed in January 2012. The SHPO (MHT) concurred on June 4, 2012 with the NPS's and WSSC's determination that the activity would have no adverse effect on historic properties (see Appendix G) due to the absence of archeological resources within the anticipated disturbances in the vicinity of the Broad Creek WWPS



3.9.2 Historic Sites and Districts

The APE for architectural resources includes three NRHP-eligible historic sites and districts, described below.

- **Broad Creek Historic District:** The Broad Creek Historic District is a 589-acre local historic district that was found eligible for the NRHP in March 2001. The district encompasses the extant components of the colonial port town of Aire and includes four contributing buildings/sites (Harmony Hall, Want Water, Saint John's Church, and Piscataway House). The boundaries also include vistas and visual approaches, landscape features contributing to the district's semi-rural setting, and the original site of the town of Aire or Broad Creek. The proposed project's archeological and architectural APEs are entirely within the boundaries of the District.
- **Harmony Hall:** The 65-acre NPS-owned parcel containing Harmony Hall and Want Water was listed on the NRHP in 1980. The project's archeological APE is entirely within the Harmony Hall NRHP boundaries. The proposed project's architectural APE includes the entire Harmony Hall property parcel and the 0.64-acre archeological APE includes a north-central portion of the Harmony Hall parcel.
- **Piscataway House:** The Piscataway House is a historic property that was found eligible for the NRHP in January 2000. The house was originally located in the town of Piscataway and was moved to its present location circa 1942. The house is not located within the archeological APE, but is included within the architectural APE.

3.9.3 Cultural Landscapes

Cultural landscapes include the landscape portions of historic properties and districts that contain the historic structures.

The Broad Creek Historic District contains a historic vernacular landscape that includes Harmony Hall and other historic sites. These historic sites represent landscapes significant for their association with historic events, activities, or persons.

The Broad Creek Historic District cultural landscape demonstrates the settlement patterns of Prince George's County's earliest European settlements, and some of the earliest such settlements in Maryland. This local landscape is part of the Potomac River valley, with extensive amounts of rurally developed land visible from the western shore of the Potomac and the George Washington Memorial Parkway (about 2 ¼ miles distant from Harmony Hall). The NPS, county, and Maryland-National Parks and Planning Commission own adjoining tracts of land in this area. These park tracts make up a large part of the Broad Creek Historic District, with a prominent feature including the wooded and open setting along Livingston Road.

The Harmony Hall historic site's cultural landscape includes 65 acres of the original Battersea tract patented in 1662, operated as a plantation with a Georgian manor house in the eighteenth and nineteenth century. The manor house retains its wooded setting within a preserved river frontage with open vistas to the Potomac River to the west and Livingston Road to the east. The cultural landscapes associated with Harmony Hall and the Broad Creek Historic District are included in the historic site and district boundaries and are therefore addressed under Section 106 of the NHPA. Therefore, measures to avoid, minimize, and mitigate for impacts to the cultural landscape must be investigated for any action also under the jurisdiction of NEPA.

3.10 Visitor Use and Experience

The NACE property is currently the site of the Harmony Hall manor, located at the southeast corner of the property, and the Broad Creek WWPS along the northern edge of the property. The Broad Creek WWPS has a private entranceway from Livingston Road, approximately one-quarter of a mile north of the Harmony Hall manor entrance. Harmony Hall manor is located within the parkland, but is currently closed and in repair. Its future use is undecided. Public access to Harmony Hall manor and vehicular access to the grounds are restricted, but there is no physical obstruction to the surrounding parkland for pedestrians. Therefore, pedestrians can access the park's grounds via the Harmony Hall manor entrance to the park or via the entranceway to the Broad Creek WWPS. The parkland surrounding the Broad Creek WWPS and the historic site primarily functions as a riparian buffer and is not currently used for active recreation. It can be used for passive recreation such as bird watching. Public access to the Broad Creek WWPS, which is not clearly visible from Livingston Road or Harmony Hall manor is restricted by a gate and fencing. The Broad Creek WWPS is located within the interior of the property. The entire park property is used infrequently by visitors, but use would increase when the manor is refurbished and/or when the southern Prince George's County historic trail system is established throughout the region.

3.11 Human Health and Safety

Presently, the Broad Creek WWPS is designed to operate at a maximum pumping capacity of 38.7 million gallons per day. Flows in excess of that amount have occurred during wet weather periods and have caused SSOs to enter Broad Creek. WSSC informs the Prince George's County Health Department and the Maryland Department of Health when overflow volumes occur. Water contact recreation is prohibited for periods following SSOs because of the threat to public health from diluted untreated sewage.

Human health and safety issues are relevant for any project involving construction and excavation, particularly when hazardous materials may be encountered. The NPS and WSSC considered known contaminated sites in its assessment of health and safety. In addition to hazardous materials, projects may potentially create an unsafe atmosphere during their construction and operation. Increased traffic and new sources of pollutants could also occur.

The NPS and WSSC developed a preliminary list of regulatory sites and associated contaminants of concern with the potential to adversely impact the construction areas for the proposed project. The sites were included based on their distance and topography in relation to the proposed construction areas, the location of surface water bodies, and information in the Phase I environmental site assessment conducted for the Broad Creek WWPS to the Piscataway Creek WWTP (CEM, August 2010). The NPS and WSSC obtained a corridor study from Environmental Data Resources, Inc. (EDR, June 2010) to complete the environmental site assessment (WSSC, August 2010D). The NPS and WSSC examined numerous public databases, which were compiled by federal, state, and local governmental agencies. The NPS and WSSC examined these databases for records of environmental concerns at sites on or near the proposed project. In addition to the EDR report, WSSC conducted field investigations, and sent questionnaires to property owners, and conducted follow-up interviews. Table 3-3 lists specific sites mentioned in the environmental site assessment that are closest to the study area.

Table 3-3: Records of Environmental Concerns from Public Databases

Owner and Address (a)	Regulatory Database (a)	Comments (a)	Direction and Distance from Broad Creek WWPS Construction Site (b)
Residence 10307 Livingston Road	N/A	Heating oil UST, a pole-mounted transformer, and an abandoned septic field	Adjacent to the site, to the north Approximately 500 feet away
Residence 10510 Livingston Road	LEAD	Facility passed all inspections	Southeast of the site, across Livingston Road Approximately 1000 feet away
PEPCO 10511 Livingston Road	OCPCASES	2004 Release, case closed; 2009 Release, case active	On NPS property (see address below)
National Park Service 10511 Livingston Road	UST	500-gallon heating oil UST permanently out of use	Approximately 500 feet away
M-NCPPC Harmony Hall Regional Center 10701 Livingston Road	FINDS HIST UST UST	Identified in AFS and MD-PEMIS databases 2,000-gallon heating oil UST currently in use 2,000-gallon heating oil UST permanently out of use	South of the site Approximately 1,500 feet away

Notes: AFS, AIRS Facility Subsystem; FINDS, Facilities Index System; HIST UST, historical underground storage tank; LEAD, lead, Pb; MD-PEMIS, Maryland Permanent Air Emissions; OCPCASES, Oil Control Program cases; UST, Underground Storage Tank.

Sources: (a) EDR, June 2010; (b) approximate measurements taken from USGS topographic maps and aerial photographs.