PROGRAMMATIC AGREEMENT
AMONG
THE DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY
THE NATIONAL PARK SERVICE
THE DISTRICT OF COLUMBIA STATE HISTORIC PRESERVATION OFFICER
AND
THE NATIONAL CAPITAL PLANNING COMMISSION
PURSUANT TO 36 CFR 800
REGARDING
THE POTOMAC RIVER TUNNEL PROJECT

This Programmatic Agreement (hereinafter Agreement) is entered into this 16 day of March, 2020, by and between THE DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY (hereinafter DC Water), an independent authority of the District of Columbia, the National Park Service (hereinafter NPS), the District of Columbia State Historic Preservation Officer (hereinafter DC SHPO), and the National Capital Planning Commission (hereinafter NCPC).

RECITALS

WHEREAS, DC Water, the District of Columbia (hereinafter the District), the Environmental Protection Agency (hereinafter EPA), and the Department of Justice, entered into a Federal Consent Decree in 2005 to establish a judicially enforceable schedule to implement the Combined Sewer Overflow (hereinafter CSO) control measures outlined in DC Water's Combined Sewer System Long Term Control Plan (hereinafter LTCP); and

WHEREAS, the *First Amendment to Consent Decree* (hereinafter Amended Consent Decree) was entered by the US District Court for the District of Columbia in January 2016; and

WHEREAS, the Amended Consent Decree includes construction of a tunnel to intercept and convey CSOs to the Blue Plains Advanced Wastewater Treatment Plant via gravity; and

WHEREAS, the Amended Consent Decree includes the assessment of the practicability of utilizing green infrastructure (hereinafter GI) to provide control for CSOs 027, 028, and 029; and should GI be determined practicable, GI facilities would be constructed to control the impervious acreage required by the Amended Consent Decree for one or more of these sewersheds in lieu of the corresponding portion(s) of the tunnel and associated infrastructure; and

WHEREAS, should GI be determined impracticable, DC Water would provide control for CSOs 027, 028, and 029 utilizing the tunnel system; and

WHEREAS, DC Water therefore proposes to implement the Potomac River Tunnel Project, defined for this Agreement to include construction of the Potomac River Tunnel, diversion facilities, and other supporting infrastructure, including but not limited to ventilation control facilities, an emergency overflow structure, and drop, mining, and ventilation shafts (hereinafter Gray Infrastructure); and

WHEREAS, the Amended Consent Decree stipulates that the tunnel be placed into operation by March 23, 2030; and

WHEREAS, NPS has determined that issuance of NPS permits, including but not limited to Special Use Permits and Right of Way Permits, for construction of the Potomac River Tunnel Project constitutes an Undertaking subject to review under 54 USC 306108 (formerly 16 USC 470f), and *Protection of Historic Properties,* its implementing regulations, 36 CFR Part 800 (hereinafter Section 106); and

WHEREAS, the potential effects of implementing the Potomac River Tunnel Project have been analyzed and documented in an *Environmental Assessment* (2018), and an *Assessment of Effects Report* (2018) (Attachment A),

prepared pursuant to the National Environmental Policy Act (hereinafter NEPA), and Section 106, respectively; and

WHEREAS, portions of the Potomac River Tunnel Project located on land owned or under the jurisdiction of the District of Columbia and/or private entities are subject to review under Section 9b and other applicable sections of the DC Historic Landmark and Historic District Protection Act of 1978 (DC Law 2-144) (hereinafter DC Historic Preservation Law); and

WHEREAS, DC Water and NPS initiated consultation with the DC SHPO for the Potomac River Tunnel Project in a letter dated November 18, 2014; and

WHEREAS, DC Water and NPS have consulted with the DC SHPO regarding development of this Agreement pursuant to Section 106 and DC Historic Preservation Law; and

WHEREAS, NPS has invited DC Water to be a Signatory to this Agreement since DC Water assumes certain responsibilities pursuant to this Agreement; and

WHEREAS, NCPC is a Signatory in the Section 106 process pursuant to 36 C.F.R. § 800.3(f)(1), and has approval authority over federal projects located within the District of Columbia pursuant to the National Capital Planning Act (40 U.S.C. § 8722(b)(1) and (d)), and this approval would constitute an Undertaking as defined at 36 C.F.R. § 800.16(y); and

WHEREAS, the NPS and NCPC have agreed that NPS will be the Federal lead agency pursuant to 36 C.F.R. § 800.2(a)(2) for the Undertaking to fulfill their collective Section 106 responsibilities; and NCPC has elected to fulfill its Section 106 responsibilities by participating in this consultation and is a Signatory to this PA pursuant to 36 C.F.R. § 800.6(c)(2); and

WHEREAS, the U.S. Commission of Fine Arts (CFA) is authorized to review projects on public land in the District of Columbia, as established in 40 U.S.C §§ 9101–9104, as augmented by Executive Orders 1259 and 1862, and CFA is a consulting party in the Section 106 process pursuant to 36 C.F.R. § 800.3(f)(1); and

WHEREAS, the Old Georgetown Board (OGB) of the CFA has a statutory obligation under the Old Georgetown Act (Public Law 81-808) of 1950, to review projects within the federal Old Georgetown Historic District, and is a consulting party in the Section 106 process pursuant to 36 C.F.R. § 800.3(f)(1); and

WHEREAS, DC Water and NPS have notified the Advisory Council on Historic Preservation (hereinafter ACHP) of the intention to develop an Agreement pursuant to 36 CFR 800.14(b)(1)(ii), have invited the ACHP to participate in consultation, and the ACHP has declined to participate; and

WHEREAS, members of the public were afforded opportunities to participate in project planning and to comment upon the undertaking during a public scoping period from July 2, 2014 to August 31, 2014, which included a public meeting held on July 31, 2014; during public review of the EA from October 25, 2018 to December 4, 2018, which included a public open house held on November 14, 2018; and at Section 106 Consulting Parties meetings held on January 29, 2015, December 15, 2017, and June 20, 2018; and

WHEREAS, in accordance with 36 CFR 800.2(c)(2)(ii), DC Water and the NPS initiated consultation with the Delaware Nation and the Pamunkey Indian Tribe in letters dated August 29, 2017, and invited each tribe to participate as Consulting Parties; and

WHEREAS, in an email correspondence dated September 7, 2017, the Delaware Nation supported the proposed plan and requested to be a Consulting Party, informed on the progress of the project, and contacted if any discoveries arise; and

WHEREAS, in an email correspondence dated November 15, 2017, the Pamunkey Indian Tribe requested Consulting Party status; and

WHEREAS, the purpose of this Agreement is to establish a consultation process for the implementation of the Potomac River Tunnel Project in compliance with Section 106 and DC Historic Preservation Law; and

NOW, **THEREFORE**, DC Water, NPS, DC SHPO, and NCPC (hereinafter also referred to in the singular as Signatory, and collectively as Signatories) agree that the Potomac River Tunnel Project shall be implemented in accordance with the following stipulations and processes to take into account the effects on historic properties listed, or eligible for listing, in the National Register of Historic Places (hereinafter NRHP).

STIPULATIONS

The general site plans and facility descriptions included in the *Assessment of Effects Report* for the Potomac River Tunnel Project serve as the basis for the assessment of potential adverse effects on historic properties as of the date of execution (as defined below). Additional consultation will be required as design details are developed for the proposed facilities required to implement the project and achieve compliance with the Amended Consent Decree. Additionally, as designs for these facilities are advanced, there is potential for currently unidentified adverse effects and for previously identified adverse effects as outlined in the *Assessment of Effects Report* to be intensified. Therefore, NPS, in coordination with DC Water, shall ensure that the following measures are carried out:

I. GENERAL REQUIREMENTS

A. **Applicable Codes and Standards.** The undertaking shall be planned, developed, and executed by DC Water and the NPS in consideration of the recommended approaches contained in the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (i.e. preservation, rehabilitation, restoration, and reconstruction) and Guidelines for the Treatment of Cultural Landscapes, and other prevailing applicable standards and guidelines. All archeological investigations and studies conducted pursuant to this Agreement shall be consistent with the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (48 FR 44716-44742, September 1983), the ACHP's *Section 106 Archeology Guidance* (June 2007), and/or the DC SHPO's *Guidelines for Archaeological Investigations in the District of Columbia* (1998), hereafter the *DC Guidelines*.

B. **Qualifications.** DC Water and the NPS shall ensure that all historic preservation and/or archeological work performed on its behalf pursuant to this Agreement shall be accomplished by, or under the direct supervision of a person or persons who meet(s) or exceed(s) the pertinent qualifications in the Secretary's Professional Standards (*Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines [As Amended and Annotated]),* formerly located at 36 CFR Part 61 in those areas in which the qualifications are applicable for the specific work performed.

II. POTOMAC RIVER TUNNEL GRAY INFRASTRUCTURE

A. DESIGN REVIEW

1. **Design.** Permanent construction will result in tunnel infrastructure that has the potential for adverse effects. DC Water will develop facility designs in consultation with the NPS

and the DC SHPO (collectively the Reviewing Agencies), as required by law and in accordance with this Agreement, and as outlined in Table II-1, to ensure that siting, design details, and selected materials are compatible with National Mall and Memorial Parks, Rock Creek Park, C&O Canal NHP, and other historic properties. DC Water will consult with other agencies, including but not limited to the CFA and the NCPC, as required by law.

2. **Design Review.** DC Water will provide for design review of site restoration plans and permanent at- and above-grade tunnel infrastructure, including, but not limited to, the visible portions of the emergency overflow structure, ventilation control facilities, electrical equipment/cabinets, ventilation grating, and structure access points in accordance with the following terms.

   a) **Signatory Review.** DC Water shall follow all applicable laws and review processes. Should the work be executed on NPS property, DC SHPO and NPS will be provided design submissions for review and comment. Should the work be executed on District or privately-owned property, DC SHPO will be provided design submissions for review and comment to the extent required by DC Historic Preservation Law. Table II-1 outlines the applicable reviewers for each component of Grey Infrastructure.

   b) **Submissions.** DC Water will submit design drawings and associated documents for at- and above-grade elements to the applicable Reviewing Agencies outlined in Table II-1. The design drawings and associated documents will include sufficient plans, cross-sections, material and finish specifications, and renderings to convey the visual effects of the infrastructure on the surrounding historic properties.

   c) **Scope of Design Review and Consultation.** The Reviewing Agencies, outlined in Table II-1, shall review and provide written comments on the design submissions within 30 calendar days. The Reviewing Agencies may request an additional 15 calendar days for review if the design submissions contain more than three sites. If no comments are received within the 30-45 day period, DC Water may implement the designs as proposed. The goals of the design review consultation process shall be to maximize consistency with the Secretary of the Interior's *Standards for the Treatment of Historic Properties*, and *Guidelines for Treatment of Cultural Landscapes*, and to develop and evaluate modifications that could avoid, minimize, or mitigate adverse effects per 36 C.F.R. §800.6(a).

   d) **Review Comments.** DC Water shall review and take any timely submitted comments into consideration. DC Water shall provide responses to the Reviewing Agencies comments and shall document changes made to the design in response to the comments. Sufficiency of responses and associated design changes due to comments provided by the Reviewing Agencies shall be determined through consultation between the Signatories.

e) **Dispute Resolution.** If DC Water and the Reviewing Agencies cannot come to agreement on design aspects of the Potomac River Tunnel Project, the Dispute Resolution process outlined in Section IV.B of this Agreement shall be followed.

g) **Previously Unidentified Adverse Effects or Intensified Adverse Effects.** If any Signatory to this Agreement determines that designs will constitute a previously unidentified adverse effect or intensify a previously identified adverse effect, that Signatory shall notify all other Signatories in writing and DC Water shall consult with all Signatories to seek ways to avoid, minimize, or mitigate the new or intensified adverse effect.

a. DC Water shall review designs and identify changes that could avoid or minimize the new or intensified adverse effect. If revisions to designs are made, DC Water shall submit the revised designs to the Reviewing Agencies. Reviewing Agencies shall have 30 calendar days to comment on revised designs. Review of designs shall proceed as outlined in Sections II.A.2.a)-e) of this Agreement.

b. Resolving Adverse Effects: If new or intensified adverse effects cannot be avoided or minimized, DC Water will consult with the Signatories to identify agreed upon measures to mitigate the intensified or newly identified adverse effects. These mitigation measures shall be incorporated into a subsequent design submittal and/or made conditions of applicable permits to be issued by the NPS and/or the DC SHPO.

B. MITIGATION SPECIFIC TO THE POTOMAC RIVER TUNNEL GRAY INFRASTRUCTURE

1. DC Water shall ensure that appropriate mitigation measures herein and identified and agreed upon during the design review process described in Section II.A.2. are undertaken as necessary. Final mitigation measures shall be incorporated as conditions of construction permits issued by NPS and the District.

2. DC Water, through consultation with the Signatories, has preliminarily identified the following potential measures to minimize or mitigate known adverse effects to National Mall and Memorial Parks (NAMA), Rock Creek Park (ROCR), C&O Canal NHP (CHOH), and other historic properties from implementation of the Potomac River Tunnel Project, summarized in Table II-1. DC Water acknowledges that additional mitigation may be necessary and will be determined as consultation continues.

Table II-1: Review Agencies and Potential Mitigation

Component	***Review Agencies***	***Minimization and Mitigation Measures (not necessarily limited to)***	***NPS Park Unit (if applicable)***
Tunnel Corridor	DC SHPO / NPS	Monitoring vibrations during construction	CHOH, NAMA, ROCR
West Potomac Park Mining Site North	DC SHPO / NPS	Design review, temporary construction signage, field restoration, tree planting at 1:1 ratio and landscaping	NAMA
West Potomac Park Mining Site South	DC SHPO / NPS	Design review, temporary construction signage, field restoration, tree planting at 1:1 ratio and landscaping	NAMA
Emergency Overflow Structure Option 1	DC SHPO / NPS	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	NAMA

Component	***Review Agencies***	***Minimization and Mitigation Measures (not necessarily limited to)***	***NPS Park Unit (if applicable)***
Emergency Overflow Structure Option 2	DC SHPO / NPS	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	NAMA
Emergency Overflow Structure Option 3	DC SHPO / NPS	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	ROCR
Ventilation Control Facility	DC SHPO / NPS	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	ROCR
CSO 020 Control Option 1	DC SHPO / NPS	Design review, temporary construction signage, field restoration, tree planting at 1:1 ratio and landscaping	NAMA
CSO 020 Control Option 2	DC SHPO / NPS	Design review, temporary construction signage, field restoration, tree planting at 1:1 ratio and landscaping. Minimization of impacts to L'Enfant view corridor of Constitution Ave NW.	NAMA
CSO 021 Control	NA	Shaft and diversion structure have been constructed. Remaining work consists of constructing adit from Potomac River Tunnel to shaft and commissioning activities. No further minimization/mitigation required	N/A
CSO 022 Control Option 1	DC SHPO / NPS	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	ROCR
CSO 022 Control Option 2	DC SHPO	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	N/A
CSO 024 Control	DC SHPO	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	N/A
CSO 027 Control Option 1	DC SHPO / NPS	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	ROCR
CSO 027 Control Option 2	DC SHPO / NPS	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	ROCR
CSO 028 Control	DC SHPO / NPS	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	CHOH
CSO 029 Control Option 1	DC SHPO	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	N/A
CSO 029 Control Option 2	DC SHPO	Design review, temporary construction signage, tree planting at 1:1 ratio and landscaping	N/A
JBAB Connection	NA	No further action required	N/A

C. ABOVE-GROUND HISTORIC PROPERTY IDENTIFICATION AND EVALUATION

1. Should any previously unevaluated, above-ground potential historic properties be identified within the Area of Potential Effects (hereinafter APE) during design development or project implementation or should any actions be taken pursuant to this Agreement that were not identified and assessed in the *Assessment of Effects Report* for the Potomac River Tunnel Project, DC Water shall ensure that reasonable efforts are made to:

   a) appropriately evaluate the potential historic properties through the development of a Determination of Eligibility Form (hereinafter DOE), if requested by NPS or SHPO; and

   b) avoid, minimize, or mitigate adverse effects on such properties in accordance with this Agreement.

D. ARCHEOLOGICAL RESOURCES IDENTIFICATION AND EVALUATION

1. DC Water has conducted archaeological resource potential assessments (Phase IA) for all the possible tunnel infrastructure construction areas presented in the *Assessment of Effects Report* for the Potomac River Tunnel Project. DC Water has also conducted archaeological survey (Phase IB) at several of these locations. Based on the Phase IA/IB

assessments and surveys, no additional investigations have been recommended at the Tunnel Mining Site North and South options, Emergency Overflow Structure Options 1 and 2, CSO 020 Control Options 1 and 2, the CSO Control 021, and the tunnel connection at Joint Base Anacostia-Bolling (hereinafter JBAB). However, additional archaeological investigations have been recommended at other construction areas, if selected for implementation, as summarized in Table II-2. The NPS and SHPO concur with these recommendations.

2. For those construction areas located on NPS property, DC Water and NPS shall jointly conduct all consultations with DC SHPO in accordance with this Agreement. For construction areas located on District of Columbia and privately-held property subject to DC Historic Preservation Law, NPS delegates its Section 106 responsibilities to DC Water who shall consult with DC SHPO in accordance with this Agreement and DC Historic Preservation Law. Actions taken to fulfill the requirements of DC Historic Preservation Law shall fulfill NPS Section 106 requirements for those construction areas. Table II-2 summarizes the reviewing agencies for each of the possible tunnel infrastructure construction areas described in the *Assessment of Effects Report*.

Table II-2: Archeological Investigations and Review Agencies

Component	***Completed Archaeological Investigation***	***Additional Required Archaeological Investigation(s)***	***Review Agencies***
Tunnel Corridor	Archaeological Assessment (Phase IA)	No additional investigations	NA
West Potomac Park Mining Site North	Archaeological Survey (Phase IB)	No additional investigations	NA
West Potomac Park Mining Site South	Archaeological Survey (Phase IB)	No additional investigations	NA
Emergency Overflow Structure Option 1	Archaeological Survey (Phase IB)	No additional investigations	NA
Emergency Overflow Structure Option 2	Archaeological Survey (Phase IB)	No additional investigations	NA
Emergency Overflow Structure Option 3	Archaeological Survey (Phase IB)	Phase II NRHP evaluation	NPS / DC SHPO
Ventilation Control Facility	Archaeological Assessment (Phase IA)	Phase II NRHP evaluation at known site 51NW120; Phase IB survey for remaining construction area	NPS / DC SHPO
CSO 020 Control Option 1	Geoarchaeological Assessment (Phase IA)	No additional investigations	NA
CSO 020 Control Option 2	Geoarchaeological Assessment (Phase IA)	No additional investigations	NA
CSO 021 Control	Archaeological Assessment (Phase IA)	No additional investigations	NA
CSO 022 Control Option 1	Archaeological Survey (Phase IB)	Phase II NRHP evaluation	NPS / DC SHPO
CSO 022 Control Option 2	Archaeological Assessment (Phase IA)	Phase IB survey east of 27th Street NW	DC SHPO
CSO 024 Control	Archaeological Assessment (Phase IA)	Phase IB survey in non-roadway areas	DC SHPO

Component	***Completed Archaeological Investigation***	***Additional Required Archaeological Investigation(s)***	***Review Agencies***
CSO 027 Control Option 1	Archaeological Assessment (Phase IA)	Phase II NRHP evaluation (terrestrial); evaluate results of terrestrial investigations to determine if underwater geophysical survey is needed	NPS / DC SHPO
CSO 027 Control Option 2	Archaeological Assessment (Phase IA)	Phase II NRHP evaluation (terrestrial); evaluate results of terrestrial investigations to determine if underwater geophysical survey is needed	NPS / DC SHPO
CSO 028 Control	Archaeological Survey (Phase IB)	Phase II NRHP evaluation (terrestrial); monitoring or geotechnical core extraction and analysis (submerged)	NPS / DC SHPO
CSO 029 Control Option 1	Partial Archaeological Survey (Phase IB)	Phase II NRHP evaluation; Phase IB survey north and east of the University access road	DC SHPO
CSO 029 Control Option 2	Archaeological Assessment (Phase IA)	Phase IB survey	DC SHPO
JBAB Connection	Archaeological Survey (Phase IB) completed for Anacostia River Projects	No additional investigations	NA

3. DC Water shall review construction drawings and documents when boundaries of construction areas are altered or if new options are considered for the Potomac River Tunnel Project focusing on excavation and ground-disturbing activities prior to the final approval of the project. DC Water shall consult with NPS (if NPS property is under consideration) and the DC SHPO regarding the need for additional archeological investigations. The DC SHPO and NPS (if NPS property is under consideration) agree to provide their comments to DC Water within 30 calendar days of receipt of notification. If no comments are received within the 30-day period, DC Water may proceed based on DC Water's decision, which shall be considered final.

4. All archeological investigations and studies conducted for the Potomac River Tunnel Project shall be consistent with the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (48 FR 44716-44742, September 1983), the ACHP's *Section 106 Archeology Guidance* (June 2007), the *DC Guidelines*, and subsequent revisions or replacements, and all stipulations incorporated into any Archaeological Resources Protection Act (hereinafter ARPA) permits that are required for investigations on NPS property. Timing of all phases of archeological investigation will be determined in consultation with the NPS (if NPS property is under consideration) and DC SHPO and, when agreed upon, may include investigations concurrent with construction activities.

5. Where needed, DC Water shall ensure that an archeological survey program for identification of archeological sites within an undertaking's limits of excavation and ground disturbance is developed in consultation with the NPS (if NPS property is under consideration) and DC SHPO. Archaeological survey (Phase IB) is recommended at CSO 029 Control Option 1, CSO 029 Control Option 2, CSO 022 Control Option 2, CSO 024 Control, and the Ventilation Control Facility within areas that have not been surveyed. Surveys will only be conducted at the sites selected for implementation. Additional survey may be required considering construction area laydowns and if construction boundaries are modified and will be identified in accordance with consultation provided for in Section II.D.3.

6. Prior to affecting any potentially eligible archeological site, DC Water shall develop a testing program of sufficient intensity to provide an evaluation of eligibility for the NRHP in consultation with the NPS (if located on NPS property) and the DC SHPO, following the regulations outlined in 36 CFR Part 800.4(c). Construction areas at which site eligibility determinations/Phase II archeological testing are recommended include CSO 022 Control Option 1 / Emergency Overflow Structure Option 3 (remains of nineteenth century Washington Gas Light facility), Ventilation Control Facility (archaeological site 51NW120), CSO 027 Control Options 1 and 2 (archaeological site 51NW075), CSO 028 Control (deposits of Historic and Native American artifacts), and CSO 029 Control Option 1 (remains of mid-nineteenth century residence). Surveys will only be conducted at the sites selected for implementation. Additional site eligibility determinations may be undertaken if archaeological resources are found at areas identified for archaeological survey in Section II.D.5.

7. If, as a result of the testing program, archeological sites are identified within an undertaking's limits of excavation and ground disturbance that are determined NRHP-eligible, DC Water shall develop a plan for their avoidance, protection, or data recovery of information as mitigation and/or other measures determined in consultation with the NPS (if located on NPS property) and the DC SHPO. Prior to implementation, any plan, including the data recovery work plan, shall be submitted to the NPS (if located on NPS property) and the DC SHPO for a 30-day review period starting upon receipt.

8. All data recovery archaeological work plans prepared under the terms of this Agreement shall include the following elements:

    a) Information on the archeological property or properties where data recovery is to be carried out, and the context in which such properties are NRHP-eligible.

    b) Information on any property, properties, or portions of properties that will be destroyed without data recovery.

    c) Discussion of the research questions to be addressed through data recovery with an explanation/justification of their relevance and importance.

    d) Description of the recovery methods to be used, with an explanation of their pertinence to the research questions.

    e) Information on arrangements for any regular progress reports or meetings to keep the NPS (if located on NPS property) and the DC SHPO informed of the course of the work. The work plan should contain the expected timetable for excavation, analysis, preparation of the draft and final report, and transmittal of collections and related data and records for curation.

    f) DC Water shall ensure that any approved treatment plan and/or data recovery work plan is/are implemented prior to the commencement of those project activities that could affect the archeological site(s).

    g) DC Water shall notify the NPS (if located on NPS property) and the DC SHPO in writing once the fieldwork portion has commenced so that a site visit may be scheduled, if requested by the Reviewing Agencies, and again when the plan is

complete. If such site visits are requested by the Reviewing Agencies, they shall be scheduled and held within five business days of notification by DC Water. A brief management summary sufficient to allow Reviewing Agencies to concur with findings will be provided; concurrence or comments on the management summary shall be provided by the Reviewing Agencies within 14 calendar days. Following the post-completion site visit (if requested by the Reviewing Agencies) and concurrence with the management summary, DC Water may proceed with implementation of construction or construction-related ground disturbing activities in the area and within the boundary of the affected archeological site(s) while the technical report is in preparation.

9. DC Water shall provide to the NPS (if located on NPS property) and the DC SHPO a draft of all archeological reports, archaeological work plans, treatment plans, management summaries, and other documentation in an agreed upon format. Reports shall include, as appropriate, recommendations on NRHP-eligibility or potential eligibility of all identified archeological sites (and if applicable any newly identified historic properties), recommendations for further archeological investigations, the potential effects of the undertaking on historic properties, and suggested measures to resolve adverse effects through avoidance, minimization, or mitigation.

10. For archaeological resources located on NPS property, the NPS and the DC SHPO agree to provide their comments to DC Water within 30 calendar days from the date of receipt of draft archeological reports, treatment plans, work plans, and other documentation. DC Water shall address all comments received within the 30-day review period and provide final reports to the NPS and the DC SHPO in an agreed upon format. If no comments are received within the 30-day period, DC Water shall assume that the non-responding party has no comments and concurs with the findings and recommendations of the report/document. If the NPS and the DC SHPO concur with the recommendations, DC Water shall proceed with implementation of the recommendations. If the NPS and DC SHPO do not concur with the recommendations, the parties shall consult further to resolve the issues following the provisions for Dispute Resolution in Section IV.B of this Agreement.

11. For archaeological resources located on District or privately-held property, the DC SHPO agrees to provide comments to DC Water within 30 calendar days from the date of receipt of draft archeological reports, work plans, treatment plans, management summaries, and other documentation. DC Water shall address all comments received within the 30-day review period and provide final reports to the DC SHPO in an agreed upon format. If no comments are received within the 30-day review period, DC Water shall assume that the DC SHPO has no comments and concurs with the findings and recommendations of the report/document. If DC SHPO concurs with the recommendations for that phase, DC Water will proceed with implementation of the recommendations. If DC SHPO does not concur with the recommendations, the parties shall consult further to resolve the issues following the provisions for Dispute Resolution in Section IV.B of this Agreement.

12. For those collections associated with survey, testing, and/or data recovery conducted on NPS property, collections shall be prepared by DC Water consistent with the ARPA permit stipulations and guidance from NPS. Collections shall be submitted by DC Water to the NPS NCR Museum Resource Center in Landover, Maryland or another facility as directed by the ARPA permit. DC Water shall be responsible for paying reasonable one-time "per box" cataloging and curation fees for collections generated pursuant to this Agreement. Electronic copies of field notes, maps, geospatial data, artifact databases, digital images, related records, and other documents prepared in accordance with the NPS ARPA permit shall also be submitted simultaneously to the DC SHPO.

13. For those collections associated with survey, testing, and/or data recovery conducted on property owned by the District, collections, including artifacts, final report digital and hard copies, electronic data, field notes, and related records shall be prepared consistent with the *DC Guidelines*. Collections shall be submitted to the DC SHPO within 60 calendar days of submittal of a final report of investigations. Additional copies of the final report shall be submitted to the repositories specified in the *DC Guidelines*.

14. For those collections associated with survey, testing, and/or data recovery conducted on privately-owned property, the artifacts shall be returned to the landowner if so requested. Electronic files of field notes, maps, geospatial data, artifact databases, digital images, related records, and others as required shall be prepared consistent with the *DC Guidelines* and submitted to the DC SHPO within 60 calendar days of submittal of a final report of investigations. If a landowner elects to deed the artifacts to the District, provisions for curation in II.D.13 shall be followed.

15. In the event that archeological field investigations are required on NPS property, in accordance with ARPA, upon receipt of an application from DC Water and/or its archeological contractor and the subsequent 90-day review allowed under the law, the NPS shall issue a permit to DC Water or its contractor to ensure that all archeological work will follow the appropriate DC SHPO guidelines, the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (1983), and NPS Director's Order 28: *Cultural Resource Management* (1998).

16. **Unanticipated Archeological Discoveries.** DC Water shall include as a provision in its construction documents requirements for the treatment of unanticipated archeological discoveries, including human remains, during excavation or other ground-disturbing activities, resulting from the implementation of the project. The NPS and the DC SHPO agree to provide their comments to DC Water within 30 calendar days from the date of receiving the requirements such as an archaeological work plan if additional investigations are necessary to assess eligibility. If no comments are received within the thirty 30-day review period, DC Water shall assume the NPS and the DC SHPO have no comments and concur with the requirements. If the NPS or the DC SHPO do not concur, the parties shall consult further to resolve the issues following the provisions for Dispute Resolution in Section IV.B of this document. The requirements shall include but are not limited to the following:

a) If previously unidentified archeological resources are discovered during construction, the construction contractor shall immediately halt all activities in the area of the resource and notify DC Water of the discovery.

b) Upon receipt of the notification, DC Water shall:

   a. inspect the construction site to determine the extent of the discovery and ensure that construction activities have halted;

   b. clearly mark the area of the discovery;

   c. implement additional measures, as appropriate, to protect the discovery from damage;

   d. have an archeologist meeting Secretary of the Interior's *Professional Qualifications Standards for Archeologists* inspect the construction site to determine the extent of the discovery and provide recommendations regarding its NRHP eligibility and treatment; and

   e. halt construction and notify the NPS NCR Regional Archeologist immediately (if located on NPS property) and then the DC SHPO of the discovery describing the measures that have been implemented to comply with Section II.D.16.

c) Within three (3) business days of the original notification of discovery described in Section II.D.16, DC Water shall provide the NPS (if located on NPS property) and the DC SHPO with its assessment of the NRHP eligibility of the discovery and the measures DC Water proposes to take to resolve adverse effects. In making its official evaluation, DC Water, in consultation with the NPS (if located on NPS property) and the DC SHPO may assume the discovery to be NRHP-eligible pursuant to 36 CFR Part 800.13(c). The NPS (if located on NPS property) and the DC SHPO shall respond within three (3) business days after their receipt of submission by DC Water of their official evaluation.

d) DC Water shall comply with NPS (if located on NPS property) and DC SHPO recommendations on eligibility and treatment of the discovery, shall ensure that appropriate actions are carried out, and shall provide NPS (if located on NPS property) and the DC SHPO with a report on these actions when they have been implemented. If further archaeological investigations are required, they shall be carried out following approval of the work plan and in accordance with standards, reporting, analysis, and curation requirements detailed in Stipulation II.D.

e) Construction activities may proceed in the area of the discovery when NPS or DC SHPO, as applicable, has determined that implementation of the actions undertaken to address the discovery pursuant to Section II.D.16 are complete.

17. **Human Remains.** DC Water shall make all reasonable efforts to avoid disturbing gravesites and associated funerary objects. DC Water shall treat all human remains in a manner consistent with the ACHP's *Policy Statement Regarding Treatment of Burial*

Sites, Human Remains and Funerary Objects (http://www.achp.gov/docs/hrpolicy0207.pdf) or ACHP policy in effect at the time that remains and funerary objects are handled.

a) DC Water shall halt work immediately and contact law enforcement and emergency personnel as appropriate if human remains are discovered. DC Water shall notify the NPS first (when located on NPS property) and then the DC SHPO of the discovery of human remains. DC Water shall ensure that all ground-disturbing activities in the immediate area of the discovery stays halted in accordance with the protocols established by the US Park Police or other law enforcement entities with jurisdiction. The Metropolitan Police Department and the District of Columbia Office of the Chief Medical Examiner (OCME) shall be notified and provided sufficient description of the discovery to allow OCME to complete its obligations under Statute §5-1406 of the District of Columbia Code or other applicable law(s). If the OCME determines that the human remains are not subject to a criminal investigation by local or federal authorities, DC Water shall determine appropriate disposition in consultation with NPS and/or the SHPO, as applicable.

b) If the remains found on federal lands are determined to be of Native American origin, DC Water shall comply with the provisions of the Native American Graves Protection and Repatriation Act, 25 USC § 3001 et seq. and the accompanying regulations at 43 CFR Part 10. If the remains are found on non-federal lands or are determined not to be of Native American origin, DC Water shall follow the appropriate regulations established by the District.

c) DC Water shall use reasonable efforts to ensure that the public is excluded from viewing any burial site or associated funerary objects. Subject to applicable law, the parties shall release no photographs or images of any burial site or associated funerary objects to anyone including the press and public. If they do release such photographs or images, accidentally, voluntarily, or pursuant to applicable law, they will notify the other parties as soon as possible. DC Water and the NPS (when located on NPS property) shall notify the appropriate federally recognized tribes when burials, human skeletal remains, or funerary objects are encountered on the project, or follow the appropriate regulations established by the District.

III. GREEN INFRASTRUCTURE

A. PRACTICABILITY DETERMINATION

1. Subject to and in accordance with the Amended Consent Decree, as may hereafter be amended, changed or modified, DC Water will complete a GI practicability determination. The practicability determination will consider the constructability, operability, efficacy, public acceptability, and cost per impervious acre treated for implementation of GI in lieu of tunnel infrastructure for control of CSOs 027, 028, and 029. Development of the practicability determination and subsequent EPA approval shall be the process by which GI or tunnel infrastructure is selected for control of CSOs 027, 028, and 029. For the avoidance of doubt, DC Water is not obligated in any way to

perform a GI practicability determination as part of this Agreement and this Agreement in no way bears on any decisions related thereto.

B. APPLICABILITY

1. The requirements in this Section III shall be applicable to GI constructed by DC Water within the CSO 027, 028, and 029 sewersheds in the event GI is determined practicable in all or some of these sewersheds pursuant to the Amended Consent Decree. Any GI implemented by DC Water in association with construction of Potomac River Tunnel infrastructure for the purposes of compliance with the District of Columbia Stormwater Management Regulations shall follow the processes defined in Section II. GI constructed by a District Agency as part of a District project credited or intended to be credited toward the Consent Decree-required minimum acreage shall follow the consultation requirements and practices of that agency and shall not be subject to this Agreement.

C. CONSULTATION REGARDING HISTORIC RESOURCES

1. It is anticipated that GI facilities will be constructed primarily on District and privately-held property subject to DC Historic Preservation Law and the Old Georgetown Act (Public Law 81-808, where applicable). For those GI facilities, NPS delegates its Section 106 responsibilities to DC Water, who shall consult with the DC SHPO in accordance with this Agreement and DC Historic Preservation Law, and the CFA in accordance with the Old Georgetown Act (where applicable). Actions taken to fulfill the requirements of DC Historic Preservation Law shall fulfill NPS Section 106 responsibilities for those GI facilities. Should GI be proposed on NPS property, DC Water will consult with the NPS and the DC SHPO in accordance with this Agreement. DC Water will also consult with other agencies, including but not limited to the CFA and the NCPC, as required by law.

D. ABOVE-GROUND HISTORIC PROPERTY IDENTIFICATION AND EVALUATION

1. Should any previously unevaluated, above-ground potential historic properties be identified within the APE for GI during design development or project implementation, or should any actions be taken pursuant to this Agreement that were not identified and assessed in the *Assessment of Effects Report* for the Potomac River Tunnel Project, DC Water shall ensure that reasonable efforts are made to:

   a) appropriately evaluate the potential historic properties through the development of a DOE, if requested by NPS or SHPO; and

   b) avoid, minimize, or mitigate adverse effects on such properties in accordance with this Agreement.

E. ARCHEOLOGICAL RESOURCES IDENTIFICATION AND EVALUATION

1. DC Water will conduct an archaeological assessment (Phase IA) of each area in which it proposes to construct GI and use this information to avoid and minimize effects to areas identified as having a high or moderate potential for the presence of archeological resources. If impacts to areas identified as having a high or moderate potential for the presence of archeological resources cannot be avoided, DC Water will undertake additional archaeological investigations in consultation with the DC SHPO and the NPS

(when located on NPS property) in accordance with DC Historic Preservation Law or Section 106 as applicable.

a) DC Water shall provide to the NPS (when located on NPS property) and the DC SHPO a draft of all archeological work plans, reports, treatment plans, and other documentation in an agreed upon format and in accordance with the standards and guidelines outlined in Stipulation II.D.

b) The NPS (when located on NPS property) and the DC SHPO agree to provide comments to DC Water within 30 calendar days from the date of receipt of draft archeological reports, treatment plans, and other documentation. DC Water shall address comments received within the 30-day review period and provide final reports to the NPS (when located on NPS property) and the DC SHPO in an agreed upon format. If no comments are received within the thirty (30)-day period, DC Water shall assume that the non-responding party has no comments and concurs with the findings and recommendations of the report/document.

c) All archeological investigations and studies conducted for the Potomac River Tunnel shall be consistent with the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (48 FR 44716-44742, September 1983), the ACHP's *Section 106 Archeology Guidance* (June 2007), the *DC Guidelines*, and subsequent revisions or replacements, and all stipulations incorporated into any ARPA permits that are required for investigations on NPS property.

2. **Unanticipated Archeological Discoveries.** DC Water shall treat unanticipated archaeological discoveries for the GI projects in the same manner as described in Section II.D.16 of this Agreement.

3. **Human Remains.** DC Water shall treat the discovery of human remains for the GI projects in the same manner as described in Section II.D.17.

IV. ADMINISTRATION

A. **Emergencies.** Should an emergency occur that could affect a historic or archaeological property and which represents an imminent threat to public health or safety, or creates a hazardous condition, after DC Water learns of it and notifies appropriate law enforcement and emergency personnel as necessary, DC Water shall immediately notify the Signatories of the condition which has initiated the situation and the measures taken to respond to the emergency or hazardous condition. Should the NPS or the DC SHPO desire to provide technical assistance to DC Water, they shall submit comments to DC Water within seven (7) calendar days from notification, if the nature of the emergency or hazardous condition allows for such coordination.

B. **Dispute Resolution.** Should any Signatory object in writing to NPS and DC Water regarding any actions proposed, or the manner in which the terms of this Agreement are implemented, DC Water, the NPS, the DC SHPO, and the NCPC shall consult to resolve the objection. If NPS determines that such objection(s) cannot be resolved through this consultation, NPS will:

1. Forward all documentation relevant to the dispute to the ACHP and the Signatories in accordance with 36 CFR Part 800.2(b)(2). Upon receipt of adequate documentation, the

ACHP shall review and advise NPS on the resolution of the objection. Any comments provided by the ACHP will be taken into account by NPS and DC Water in reaching a final decision regarding the dispute.

2. If the ACHP does not provide comments regarding the dispute within 30 days after receipt of adequate documentation, DC Water may render a decision regarding the dispute. In reaching its decision, DC Water will take into account all comments regarding the dispute from the Signatories.

3. The responsibility of NPS and DC Water to carry out all other actions subject to the terms of this Agreement that are not the subject of the dispute remain unchanged. DC Water will notify all parties of its decision in writing before implementing that portion of the project subject to dispute under this stipulation. DC Water will then proceed according to their final decision.

4. At any time during implementation of the measures stipulated in this Agreement, should an objection pertaining to this Agreement or the effect of implementing that portion of the project on historic properties be raised by a member of the public, DC Water shall notify the Signatories and Consulting Parties and attempt to resolve the objection. If DC Water determines that the objection cannot be resolved, DC Water shall comply with Section IV.B.1-3 of this Agreement.

5. DC Water and the DC SHPO will consult regarding any dispute relating to DC Historic Preservation Law. If either party determines such objection(s) cannot be resolved through this consultation, DC Water will forward all documentation relevant to the dispute to the DC Historic Preservation Review Board (hereinafter HPRB), who will advise DC Water within 30 days of receipt of adequate documentation. DC Water will take any HPRB comments into account in reaching its final decision and will notify the DC SHPO of its decision.

C. **Anti-Deficiency Act.** DC Water and the NPS obligations under this Agreement are subject to the availability of appropriated funds, and the stipulations of this Agreement are subject to the provisions of the Anti-Deficiency Act. DC Water and the NPS shall make reasonable and good faith efforts to secure the necessary funds to implement this Agreement in its entirety. If compliance with the Anti-Deficiency Act alters or impairs the ability of DC Water and the NPS to implement the stipulations of this Agreement, DC Water and the NPS shall consult in accordance with the amendment and termination procedures found later in this Agreement.

D. **Termination.** If any Signatory to this Agreement determines that its terms will not or cannot be carried out, that party shall immediately consult with the other Signatories to attempt to develop an amendment per Section IV.E within 30 calendar days (or another period agreed to by all Signatories). If an amendment cannot be reached, any Signatory may terminate the Agreement upon written notification to the other Signatories. Should the Agreement be terminated, DC Water shall either consult in accordance with 36 CFR Part 800.14(b) to develop a new Agreement or comply with 36 CFR Part 800 for individual undertakings.

E. **Amendments.** This Agreement may be amended when such an amendment is agreed to in writing by DC Water, the NPS, the DC SHPO, and the NCPC. The amendment will be effective on the date of the last signature.

F. **Duration.** This Agreement will terminate fifteen (15) years from the date of execution. Twelve (12) months prior to such time, DC Water may consult with the Signatories to reconsider the terms of the Agreement and revise or amend or extend the document as necessary.

G. **Entire Agreement**. This Agreement is the complete and exclusive agreement between the Signatories regarding the subject matter hereof and supersede any other prior oral or written communications or understandings between the DC Water, the NPS, the DC SHPO, and the NCPC related to the subject matter hereof.

H. **Counterparts.** This Agreement may be executed in several original counterparts, each of which shall be an original and all of which counterparts taken together shall constitute one and the same agreement. Signatures to this Agreement transmitted by electronic means (including, without limitation, via .pdf) shall be valid and effective to bind the party so signing. Each Signatory agrees to promptly deliver an execution original to this Agreement with its actual signature to the other Signatories, but a failure to do so shall not affect the enforceability of this Agreement.

I. **Electronic Copies.** Within one week of the last signature on this Agreement, NPS shall provide each Signatory with one high quality, legible, full color, electronic copy of this fully-executed Agreement and all of its attachments fully integrated into one, single document. Internet links shall not be used as a means to provide copies of attachments since links to web-based information often change. If the electronic copy is too large to send by email, NPS shall provide each Signatory with a copy of this Agreement as described above on a compact disc or other suitable electronic means.

EXECUTION of this Agreement by DC Water, the NPS, the DC SHPO, and the NCPC, and implementation of its terms, is evidence that the NPS and the NCPC have taken into account the effects of this undertaking on historic properties and afforded the ACHP a reasonable opportunity to comment, and thereby satisfied their Section 106 responsibilities.

By signing below, the Signatories acknowledge their mutual consent to be bound by the terms of this Agreement. This Agreement shall be effective as of the date corresponding to the last signature obtained to this Agreement and such date shall be known as the "date of execution" of this Agreement.

[Signatures follow on separate pages]

PROGRAMMATIC AGREEMENT
POTOMAC RIVER TUNNEL PROJECT

SIGNATORY PAGE

By: _____

Tina M. Cappetta
Superintendent
Chesapeake & Ohio Canal National Historical Park
Region 1 - National Capital Area

Date: 3/10/2020

By: _____

Jeff Reinbold
Superintendent
National Mall and Memorial Parks
Region 1 - National Capital Area

Date: 3/11/2020

By: _____

Julia Washburn
Superintendent
Rock Creek Park
Region 1 - National Capital Area

Date: 3/11/2020

PROGRAMMATIC AGREEMENT
POTOMAC RIVER TUNNEL PROJECT

SIGNATORY PAGE

By: _____

David Maloney, DC State Historic Preservation Officer
DC State Historic Preservation Office

Date: 2/28/2020

SIGNATORY PAGE

By: _____

Marcel Acosta, Executive Director
National Capital Park and Planning Commission

Date: 3/4/2020

PROGRAMMATIC AGREEMENT

POTOMAC RIVER TUNNEL PROJECT

INVITED SIGNATORY PAGE

Recommended By:

Carlton Ray
Vice President, Clean Rivers Project
DC Water and Sewer Authority

Approved By:

David Gadis
CEO and General Manager
DC Water and Sewer Authority

Date: 3/16/2020

PROGRAMMATIC AGREEMENT
POTOMAC RIVER TUNNEL PROJECT

ATTACHMENT A

FINAL POTOMAC RIVER TUNNEL ASSESSMENT OF EFFECTS REPORT

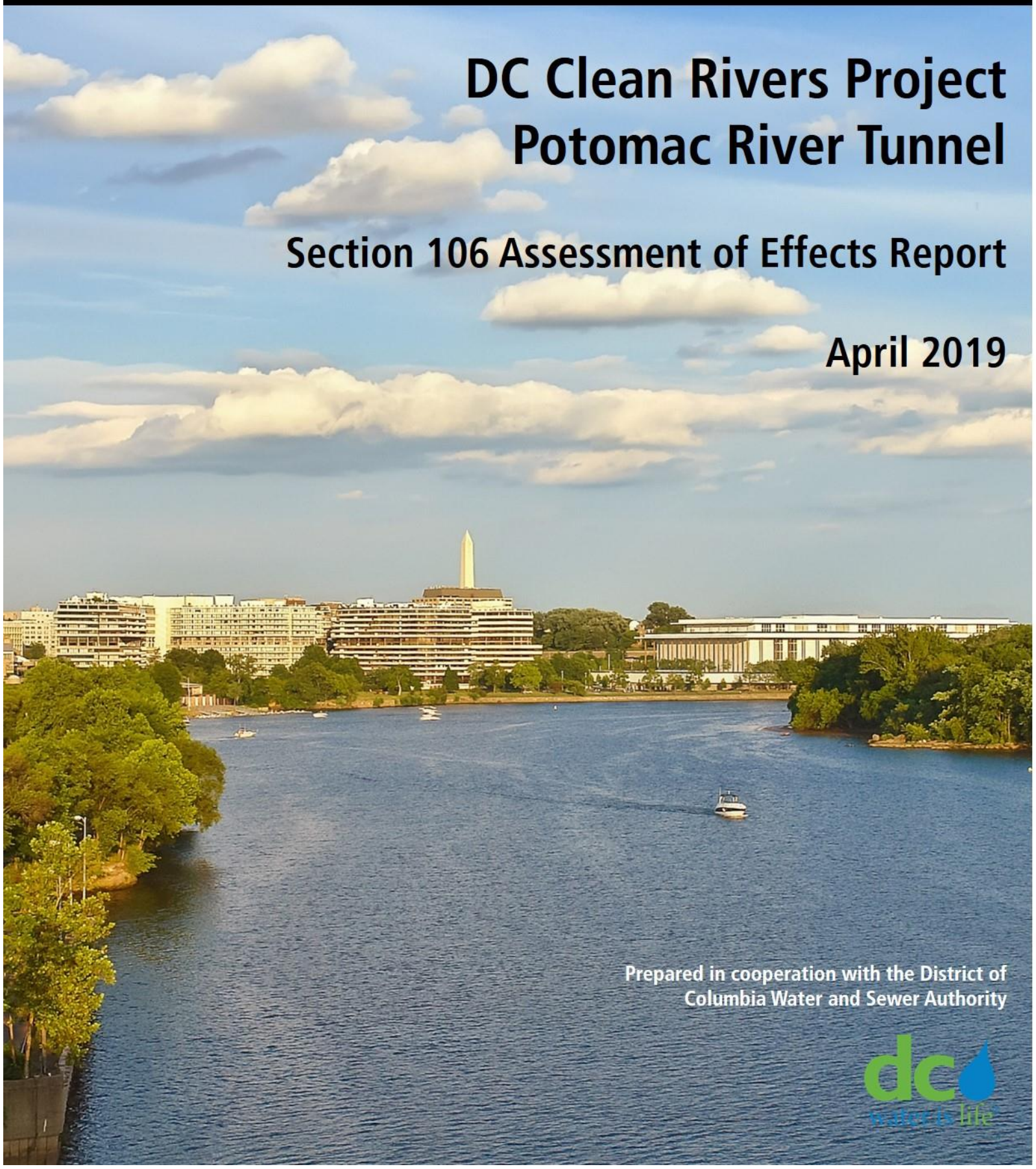
National Park Service
U.S. Department of the Interior

National Capital Region

DC Clean Rivers Project
Potomac River Tunnel

Section 106 Assessment of Effects Report

April 2019



Prepared in cooperation with the District of Columbia Water and Sewer Authority

PROJECT SUMMARY

The District of Columbia Water and Sewer Authority (DC Water) is proposing to construct the Potomac River Tunnel, a major component of DC Water's Long-Term Control Plan (LTCP), also known as the DC Clean Rivers (DCCR) Project. The purpose of the project is to substantially reduce untreated discharges from the combined sewer system to the Potomac River by increasing system storage and conveyance capacity. The project is needed to reduce combined sewer overflows (CSOs) that contribute to water quality impairment of the Potomac River and ultimately the Chesapeake Bay; and to comply with the 2005 Federal Consent Decree entered into by DC Water, the District of Columbia (the District), the Environmental Protection Agency (EPA), and the US Department of Justice, as amended January 2016 (EPA 2017). This Assessment of Effects Report (AOE Report) describes the Potomac River Tunnel project (the proposed undertaking) and the no-action alternative, and analyzes potential adverse effects on historic properties, including archeological resources, within the project area.

The proposed action involves construction of the Potomac River Tunnel and supporting infrastructure to provide control for seven CSO outfalls along the Potomac River. The proposed controls are estimated to reduce CSOs to the Potomac River by 93 percent by volume and limit their frequency to an estimated four times in a year of average rainfall. The project would include construction of diversion facilities to redirect CSOs from the existing combined sewer system into the proposed tunnel when the capacity of the existing sewer system is exceeded during storms. Once diverted to the tunnel, excess flows would be conveyed by gravity to DC Water's Blue Plains Advanced Wastewater Treatment Plant (Blue Plains) to be treated before being discharged to the Potomac River. Other supporting infrastructure, including a ventilation control facility, an emergency overflow structure, and drop, mining, and ventilation shafts would also be constructed. In addition, green infrastructure (GI) may be implemented in lieu of the tunnel for three of the CSO outfalls.

Under the no-action alternative, DC Water would continue to operate and maintain the existing combined sewer system that drains to the Potomac River CSO outfalls. CSOs would continue to occur at current levels resulting in a total discharge of approximately 654 million gallons into the Potomac River during approximately 74 CSO events in a year of average rainfall (DC Water 2015). The no-action alternative would also result in failure to meet DC Water's obligations under its Amended Federal Consent Decree and National Pollutant Discharge Elimination System (NPDES) permit, subjecting DC Water to significant penalties and other regulatory enforcement actions.

DC Water, in cooperation with the National Park Service (NPS), has prepared this AOE Report to document the effects of the proposed undertaking on historic properties in accordance with Section 106 of the National Historic Preservation Act. Concurrently, DC Water and NPS have also prepared an Environmental Assessment (EA) to assess the alternatives and their potential impacts on the environment in accordance with the National Environmental Policy Act (NEPA) of 1969; the Council on Environmental Quality "Regulations for Implementing the Procedural Provisions of NEPA" (40 Code of Federal Regulations [CFR] 1500-1508); NPS Director's Order #12: *Conservation Planning, Environmental Impact Analysis, and Decision-Making* (NPS 2011); and the NPS NEPA Handbook (NPS 2015). The EA was made available for public comment beginning October 25, 2018 and ending December 4, 2018.

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**Unless otherwise noted, all maps and photographs were produced by EHT Traceries, Inc.*

ACRONYMS AND ABBREVIATIONS

ANC	Advisory Neighborhood Commission
APE	Area of Potential Effect
AOE Report	Assessment of Effects Report
Blue Plains	Blue Plains Advanced Water Treatment Plant
C&O Canal NHP	Chesapeake and Ohio Canal National Historical Park
CFA	Commission of Fine Arts
CFR	Code of Federal Regulations
CSO	Combined Sewer Overflow
DC SHPO	District of Columbia State Historic Preservation Office
DC Inventory	District of Columbia Inventory of Historic Sites
DC Water	District of Columbia Water and Sewer Authority
DDOT	District Department of Transportation
DOE	Determined Eligible; Determination of Eligibility
EA	Environmental Assessment
EPA	Environmental Protection Agency
GI	green infrastructure
JBAB	Joint Base Anacostia-Bolling
Kennedy Center	John F. Kennedy Center for Performing Arts
LTCP	Long Term Control Plan
National Register	National Register of Historic Places
NCPC	National Capital Planning Commission
NEPA	National Environmental Policy Act of 1969
NHL	National Historic Landmark
NM	National Monument
NMC	Nine Minimum Controls
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
PEPCO	Potomac Electric Power Company
STP	Shovel Test Pit
TBM	Tunnel Boring Machine
UPI	Upper Potomac Interceptor
UPIRS	Upper Potomac Interceptor Relief Sewer
WMATA	Washington Metropolitan Area Transit Authority

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1.0 DESCRIPTION OF UNDERTAKING

1.1 PURPOSE AND NEED

DC Water is proposing to construct the Potomac River Tunnel, a major component of DC Water's LTCP, also known as the DC Clean Rivers Project. The purpose of the project is to substantially reduce untreated discharges from the combined sewer system to the Potomac River by increasing CSO storage and conveyance capacity. The project would include construction of diversion facilities to redirect CSOs from the combined sewer system to a new storage tunnel when the capacity of the existing sewer system is exceeded during storms. Once diverted to the tunnel, excess flows would be conveyed by gravity to DC Water's Blue Plains to be treated before being discharged to the Potomac River. Other supporting infrastructure, including a ventilation control facility, an emergency overflow structure, and drop, mining, and ventilation shafts would also be constructed. In addition, GI may be implemented in lieu of the tunnel to provide CSO control for CSOs 027, 028, and 029.

The average flow of the Potomac River is approximately seven billion gallons per day. In a year of average rainfall, an estimated 654 million gallons of untreated sewage and stormwater enter the Potomac River during approximately 74 CSO events. These CSOs contribute to the EPA's listing of the water quality of the Potomac River as impaired under Section 303(d) of the Clean Water Act. Waterbodies or waterbody segments are considered impaired when they do not meet EPA mandated water quality standards. CSOs impair water quality by increasing water bacteria levels, contributing to low dissolved oxygen in water, increasing the potential for fish stress or fish kills and impacts to other aquatic life, and increasing the amount of trash in waterways. This project is needed to reduce CSOs that contribute to water quality impairment of the Potomac River and ultimately the Chesapeake Bay; and to comply with the 2005 Federal Consent Decree entered into by DC Water, the District, the EPA, and the Department of Justice, as amended January 2016 (EPA 2017).

The study area for the Potomac River Tunnel project generally follows along the Potomac River from Georgetown to the north to Joint Base Anacostia-Bolling (JBAB) to the south (**Figure 1-1**). Much of the study area falls within Chesapeake and Ohio Canal National Historical Park (C&O Canal NHP), Rock Creek and Potomac Parkway Historic District, and National Mall and Memorial Parks, all administrative units of the NPS. As the existing CSOs are primarily located on NPS property, DC Water will require Special Use and Right-of-Way Permits for construction and operation of the structures necessary to meet its Consent Decree obligations.

As required by Section 106 of the National Historic Preservation Act of 1966, and its implementing regulations (36 CFR § Part 800), all federal agencies are required to consider the effects of their actions, or "undertakings," on historic properties. Historic properties are defined as any buildings, structures, objects, sites (including archaeological sites), and districts listed in, or are eligible for listing in, the National Register of Historic Places (National Register). As the NPS is the lead federal agency for the Potomac River Tunnel project, it along with DC Water, are responsible for Section 106 compliance. This AOE Report summarizes the project; outlines Section 106 consultation and public involvement; describes the alternatives and existing conditions; identifies the area of potential effect (APE) and historic properties within; and determines any potential adverse effects to those properties.

1.2 SUMMARY OF SECTION 106 CONSULTATION

Following the implementing regulations of Section 106 of the National Historic Preservation Act (36 CFR § 800), NPS and DC Water initiated consultation with the District of Columbia State Historic Preservation Office (DC SHPO) in November 2014. The NPS and DC Water have hosted a series of Section 106 meetings to discuss the project, including a public scoping meeting on July 31, 2014, a joint NEPA/Section 106 agency informational meeting on January 29, 2015, and Section 106 consulting parties' meetings on January 29, 2015, December 15, 2017, and June 20, 2018. Summaries of the consulting parties' meetings are provided in **Appendix A**.

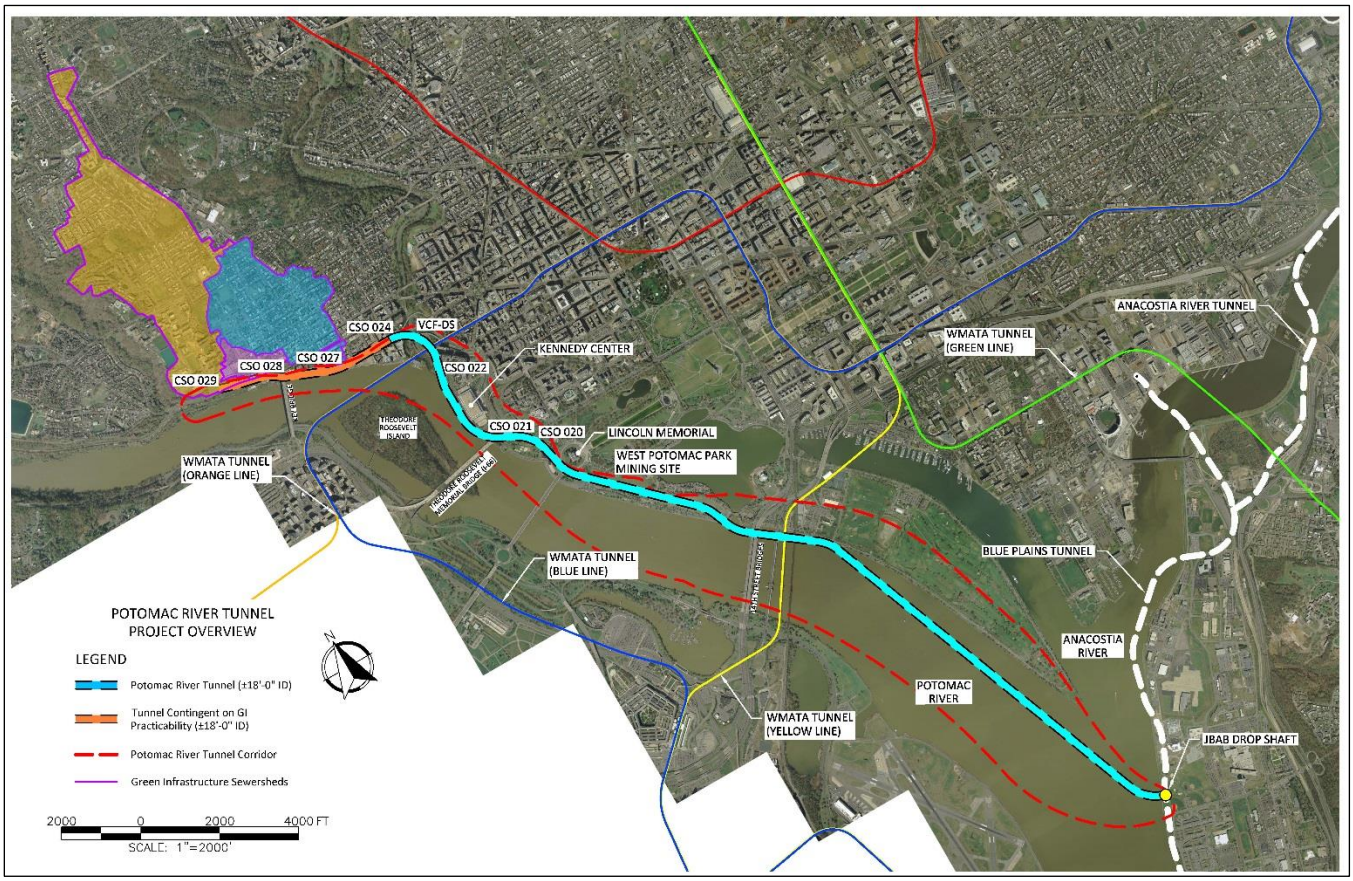

Figure 1-1: Potomac River Tunnel Study Area Map (DC Water 2017)

DC Water and NPS initiated tribal consultation on August 29, 2017. Letters seeking consultation were sent to the Delaware Nation and the Pamunkey Indian Tribe. In response, Delaware Nation's Director of Cultural Resources/Section 106 Compliance responded that the Delaware Nation concurred at present with the proposed plan and requested to be a consulting party. The response requested that the Delaware Nation be kept up to date on the progress of the project and to be contacted if any discoveries arise. To date, the Pamunkey Indian Tribe has not provided comments on the project but has requested consulting party status.

In addition to Section 106 consultation initiation and consulting parties' meetings, consultation regarding potential impacts to archaeological resources for the Potomac River Tunnel has followed the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* and the DC Preservation League's *Guidelines for Archaeological Investigations in the District of Columbia*. To date, DC Water has completed a Phase IA archaeological assessment of the construction areas and a Phase IB archaeological resource survey for selected construction areas determined to have high archeological potential. DC Water prepared Phase IA and IB work plans that were submitted to DC SHPO and NPS for approval prior to the initiation of investigations. Upon completion of the Phase IA and IB investigations, DC Water prepared a management summary of the results for review and comment by DC SHPO and NPS. DC Water obtained NPS Archeological Resource Protection Act permit 17-CHOH-NAMA-ROCR-009, effective August 1, 2017 to August 1, 2018, and several NPS special use and short-term construction permits to conduct Phase IB field investigations on NPS property, as well as District Department of Transportation and District Department of Energy and Environment permits for Phase IB field investigations on District property. DC Water has prepared a combined Phase IA and Phase IB technical report of investigations that has been submitted to DC SHPO and NPS.

2.0 IDENTIFICATION OF HISTORIC PROPERTIES

2.1 DELINEATION OF THE AREA OF POTENTIAL EFFECT

The implementing regulations of Section 106 of the National Historic Preservation Act (36 CFR § 800.16[d]) define the APE as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking." The nature of the undertaking and the large project area warrant one large Project APE along the tunnel alignment and potential GI sewersheds, allowing for collective evaluation of the entire undertaking. As a majority of the work would be conducted underground, individual maps for the Ground Level Construction Areas have been created to help understand potential direct or indirect, temporary or permanent, adverse effects where work would take place at or above the ground surface.

2.1.1 PROJECT AREA OF POTENTIAL EFFECT

The Project APE takes in to account all the potential direct effects that the Potomac River Tunnel project could have on historic properties, as well as other indirect effects, including, but not limited to, visual effects and overall viewsheds. The Potomac River Tunnel project's exact siting has not been determined; as such, the Project APE includes the maximum project area within which the tunnel and all supporting infrastructure could potentially be constructed and areas where potential visual effects might occur. The entire CSOs 027, 028, and 029 sewersheds, where GI may be implemented based on the outcome of the practicability determination, is also presented to document the possible effects GI could have on historic properties, as shown on **Figure 2-1**. The precise location of GI implementation within these sewersheds has not been determined; as such, it is assumed that the APE includes any possible locations for GI within the three sewersheds. The detailed mapping of the APE for GI can be found on **Figure 2-2**.

2.1.2 MAPPING FOR GROUND LEVEL CONSTRUCTION AREAS

Ground Level Construction Areas have been identified for the individual components of the Potomac River Tunnel project. The limits of construction have been highlighted on individual maps to assess potential direct and indirect effects at each of the locations within the Project APE. This includes the limits of construction and staging at the ground surface to construct supporting tunnel infrastructure, including diversion facilities, a ventilation control facility, an emergency overflow structure, and drop, mining, and ventilation shafts, in addition to adjacent areas used for various vehicle, equipment, and materials staging activities. These sites would be used to identify the direct and indirect effects that temporary and permanent construction would have on the historic properties, which includes archaeological resources. There are seventeen different Ground Level Construction Areas which can be found on **Figure 2-3** through **Figure 2-23**. Not all Ground Level Construction Areas will be utilized, as some will be eliminated based on final selection of options for various project components.

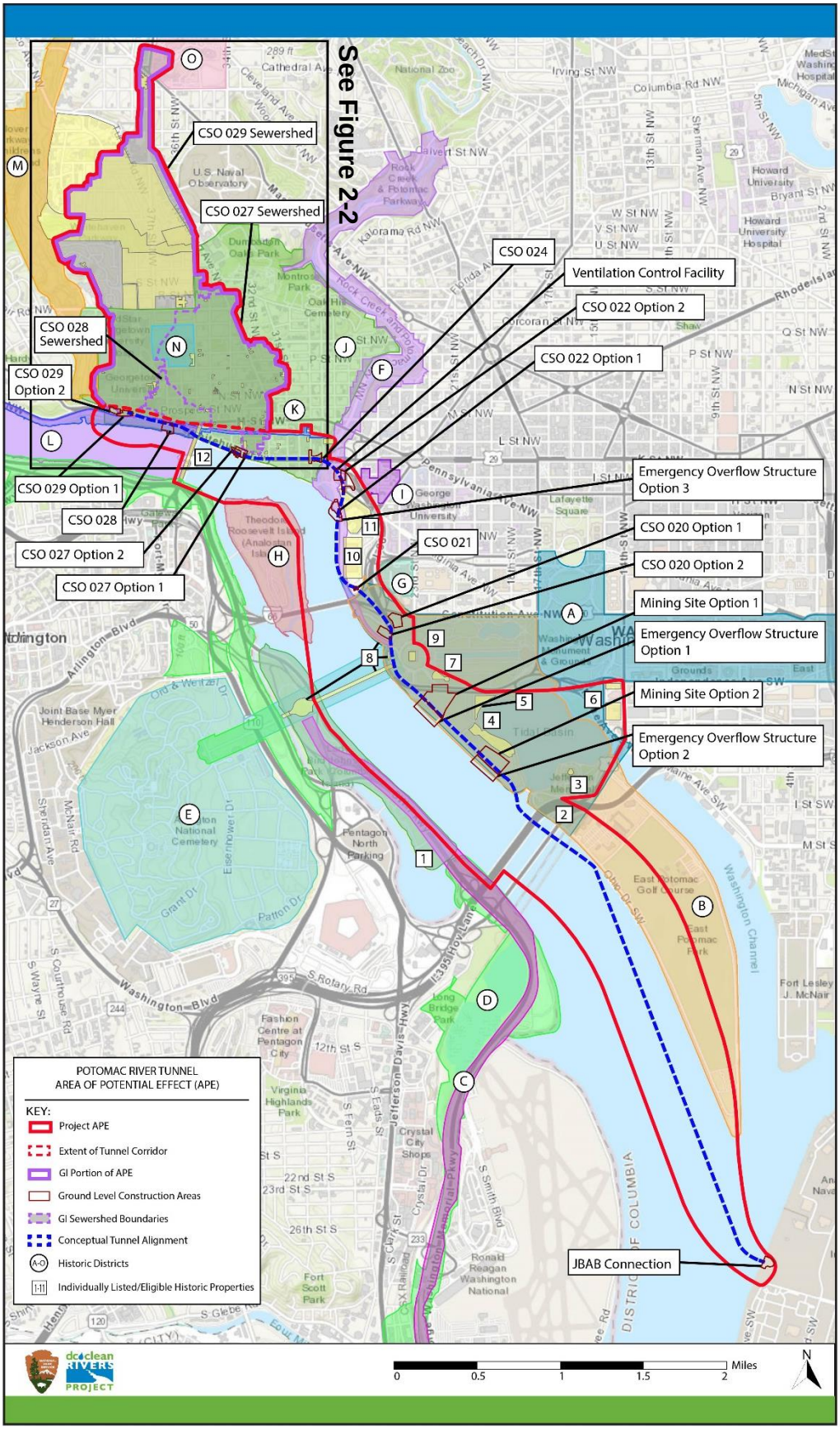

Figure 2-1: Project Area of Potential Effect (APE)

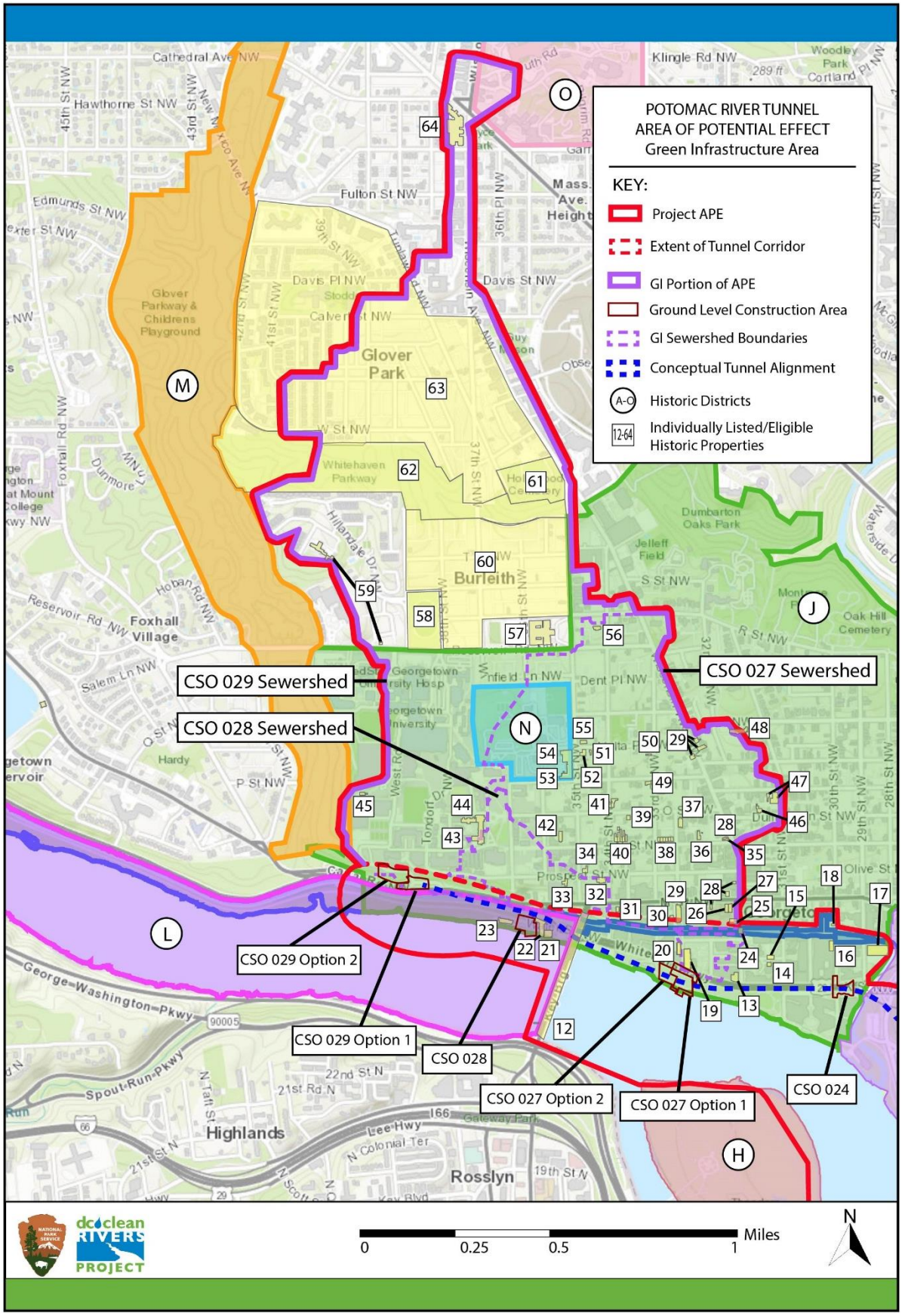

Figure 2-2: Green Infrastructure portion of Project APE

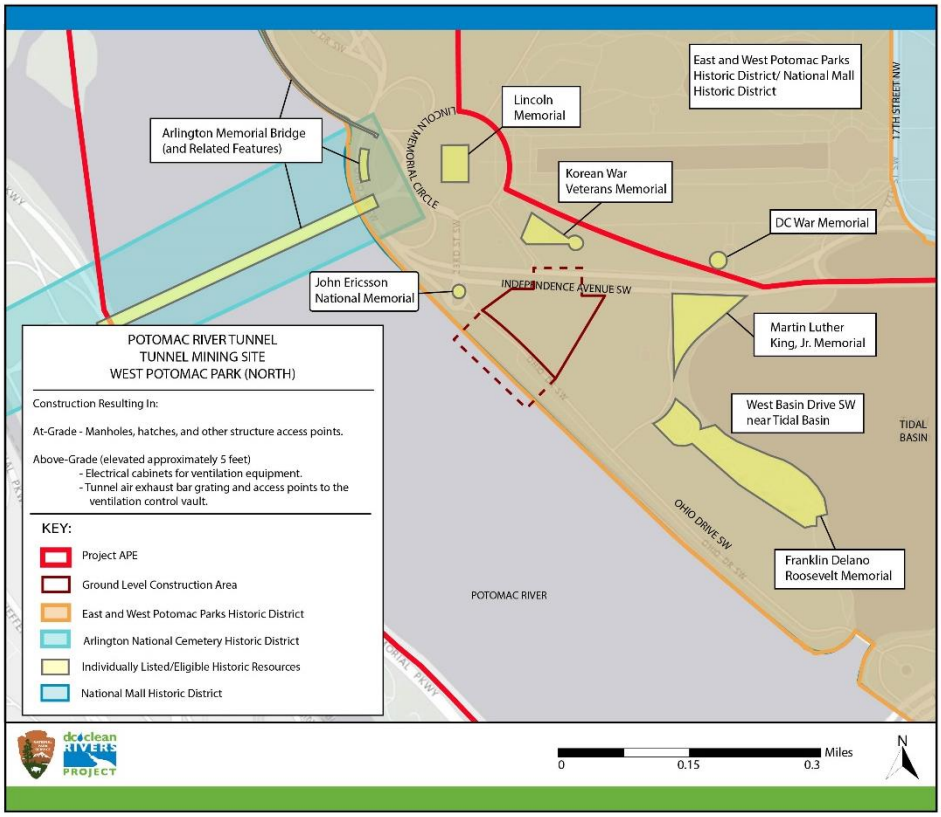

Figure 2-3: Component 2 – Tunnel Mining Site Option 1 – West Potomac Park (North)

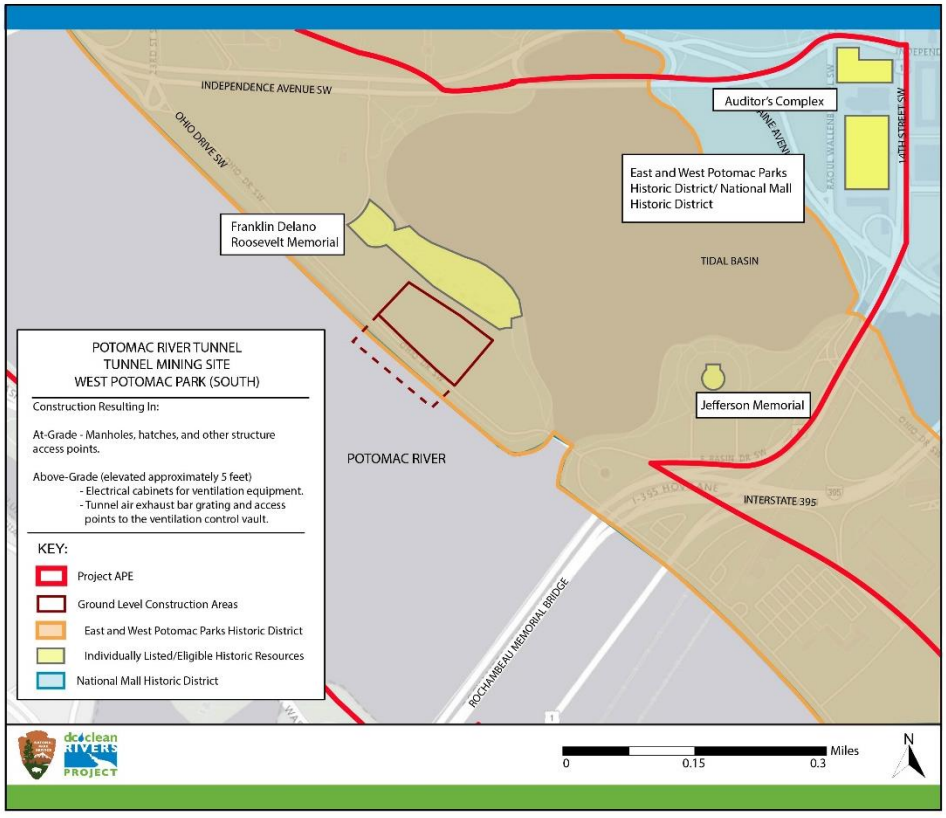

Figure 2-4: Component 2 – Tunnel Mining Site Option 2 – West Potomac Park (South)

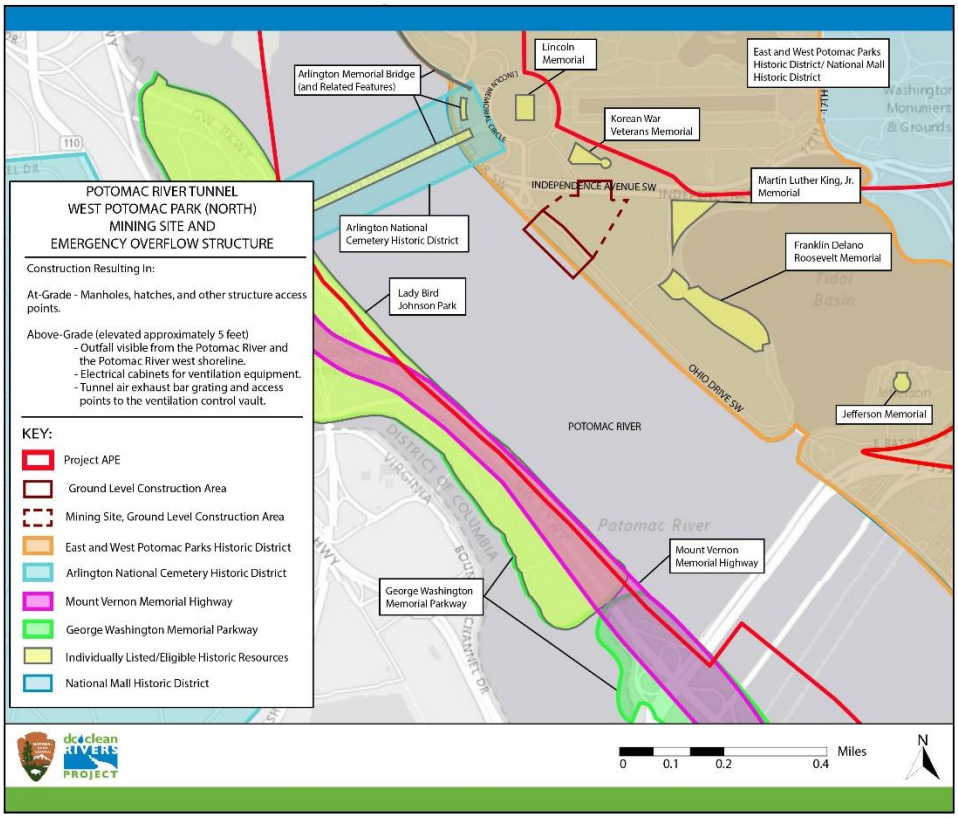

Figure 2-5: Component 3 – Emergency Overflow Structure Option 1 – West Potomac Park (North)

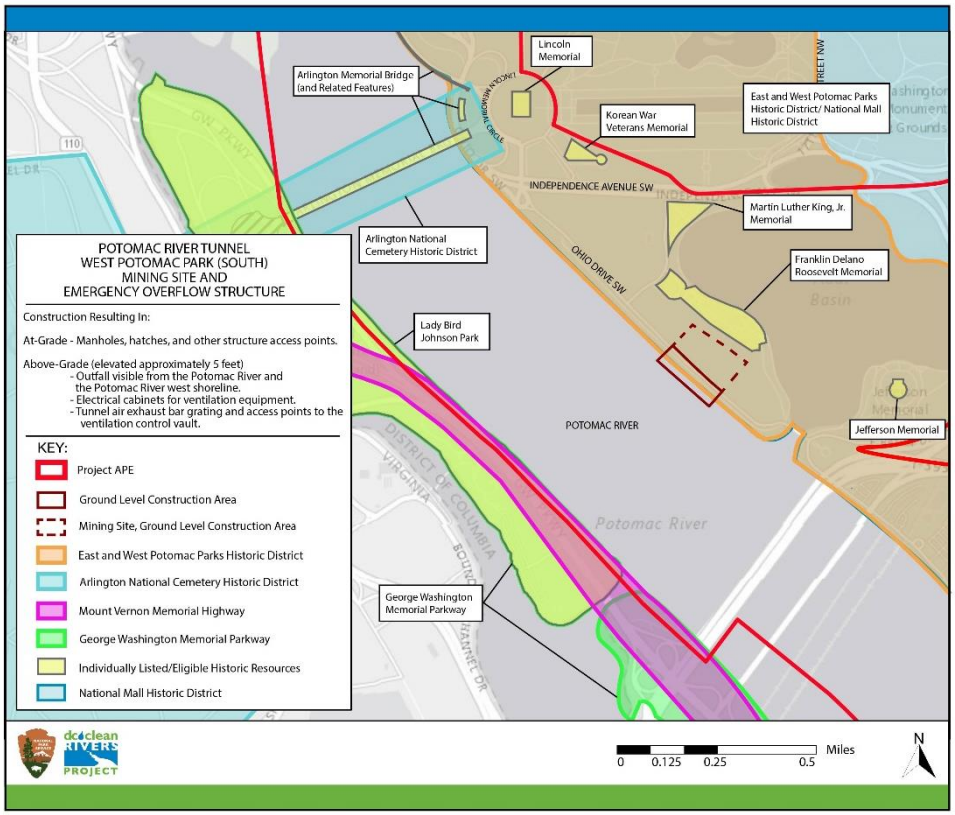

Figure 2-6: Component 3 – Emergency Overflow Structure Option 2 – West Potomac Park (South)

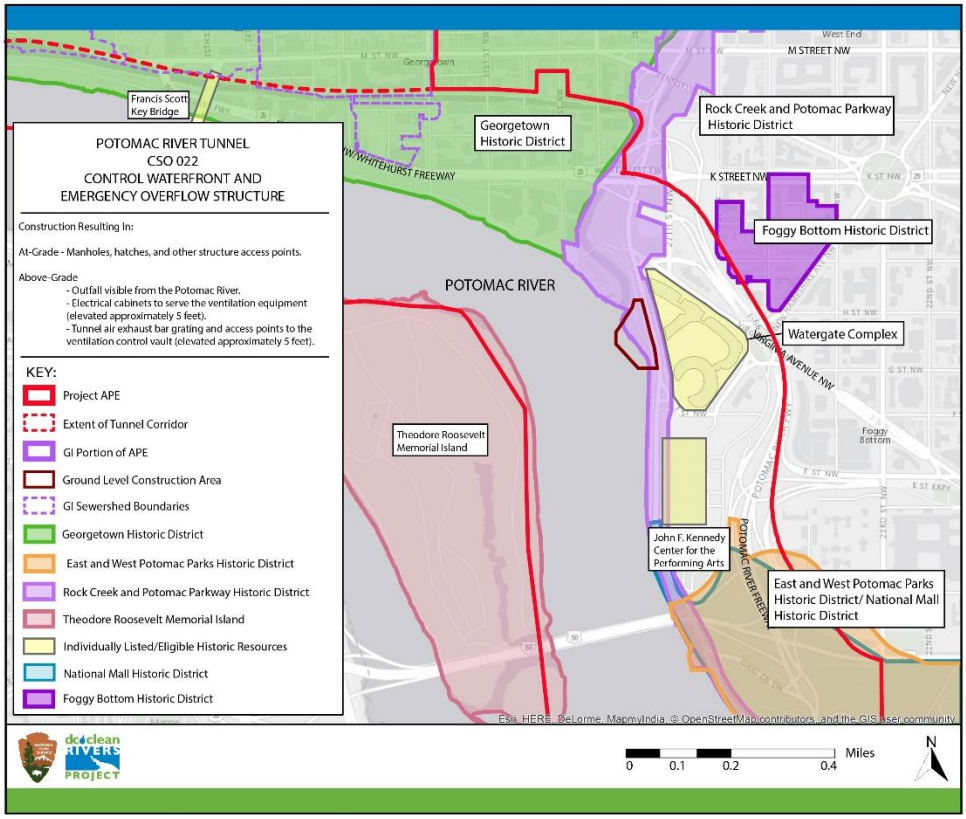

Figure 2-7: Component 3 – Emergency Overflow Structure Option 3 – CSO 022

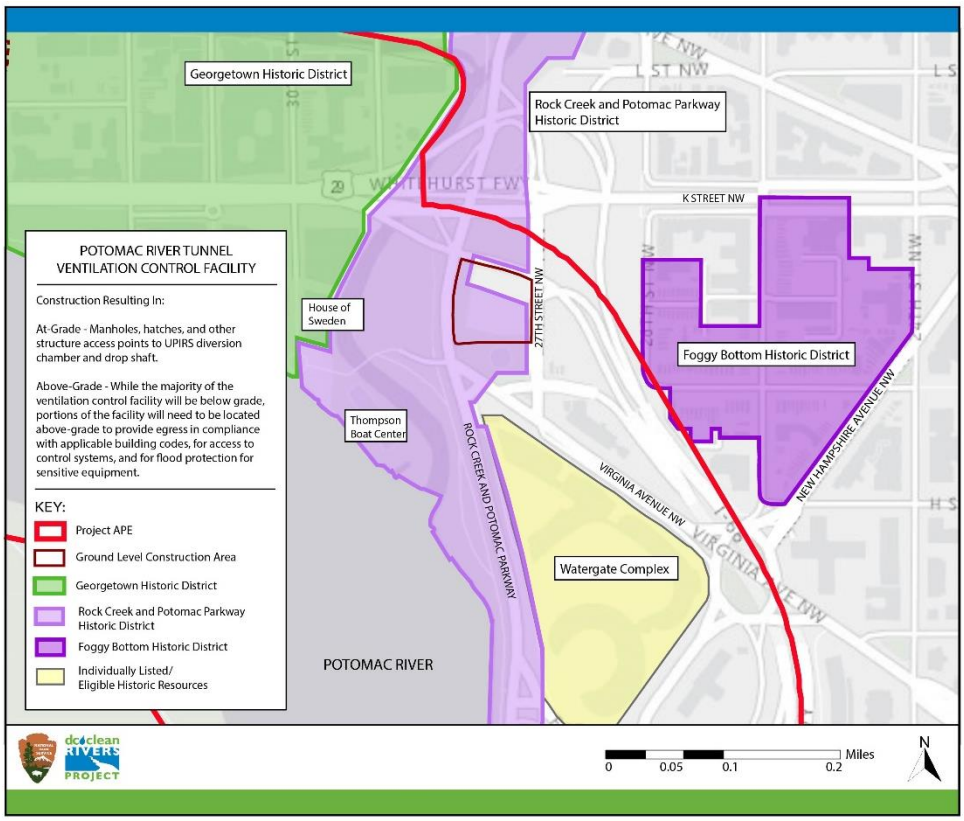

Figure 2-8: Component 4 – Ventilation Control Facility and UPIRS Diversion Structure

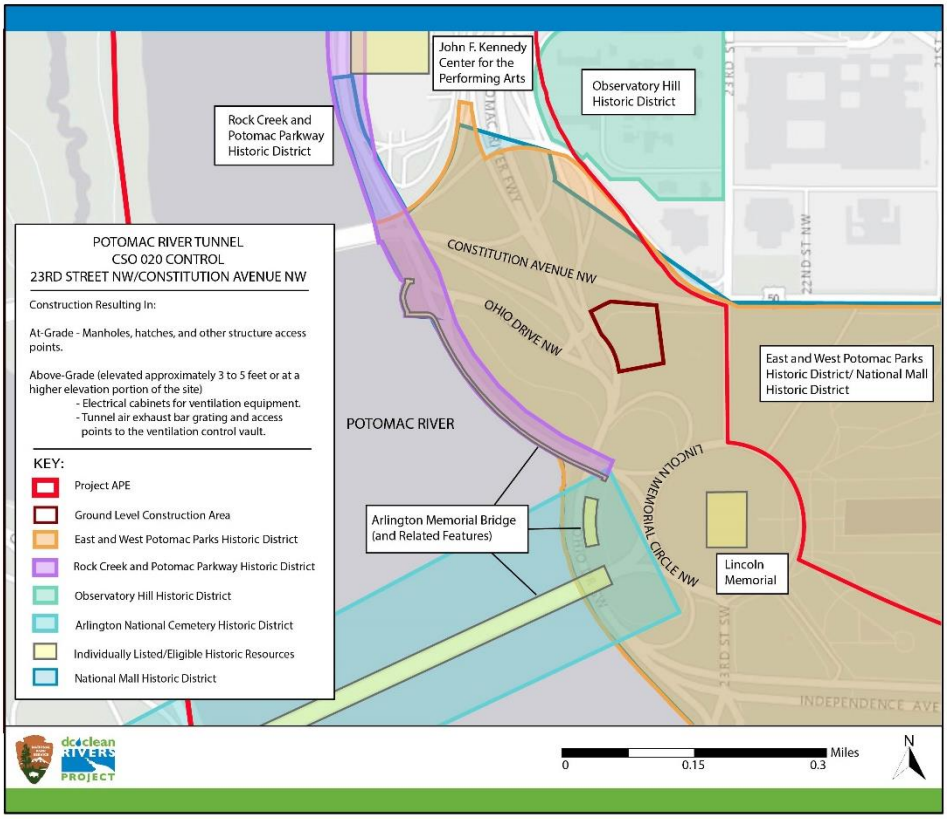

Figure 2-9: Component 5 – CSO 020 Control Option 1 – 23rd St NW/Constitution Ave NW

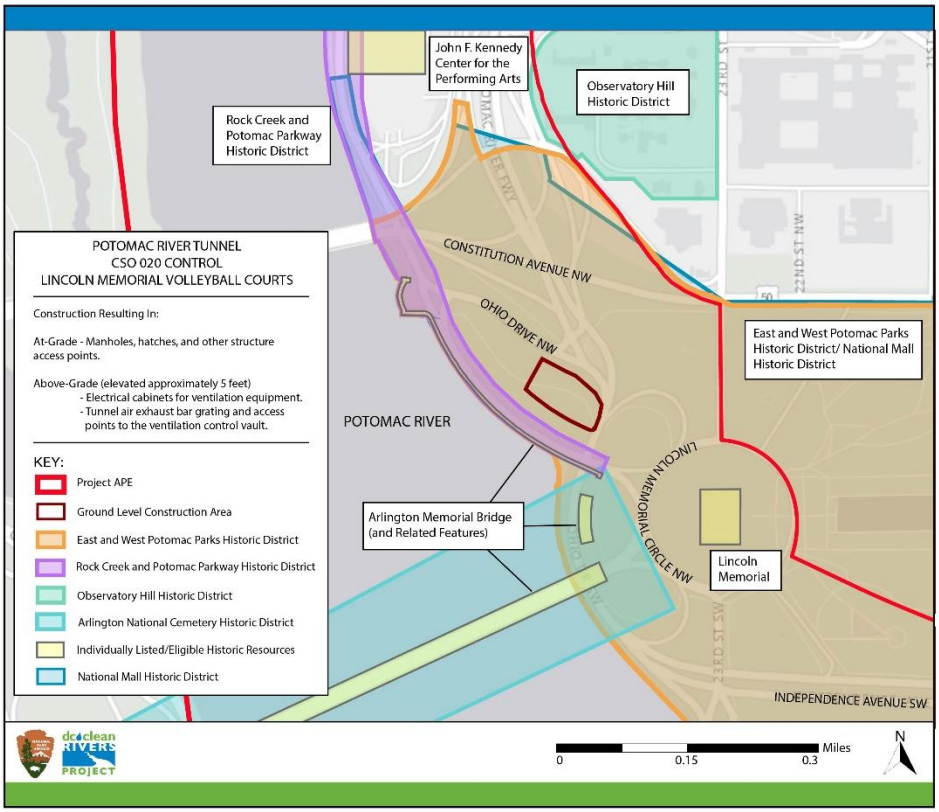

Figure 2-10: Component 5 – CSO 020 Control Option 2 – Lincoln Memorial Volleyball Courts

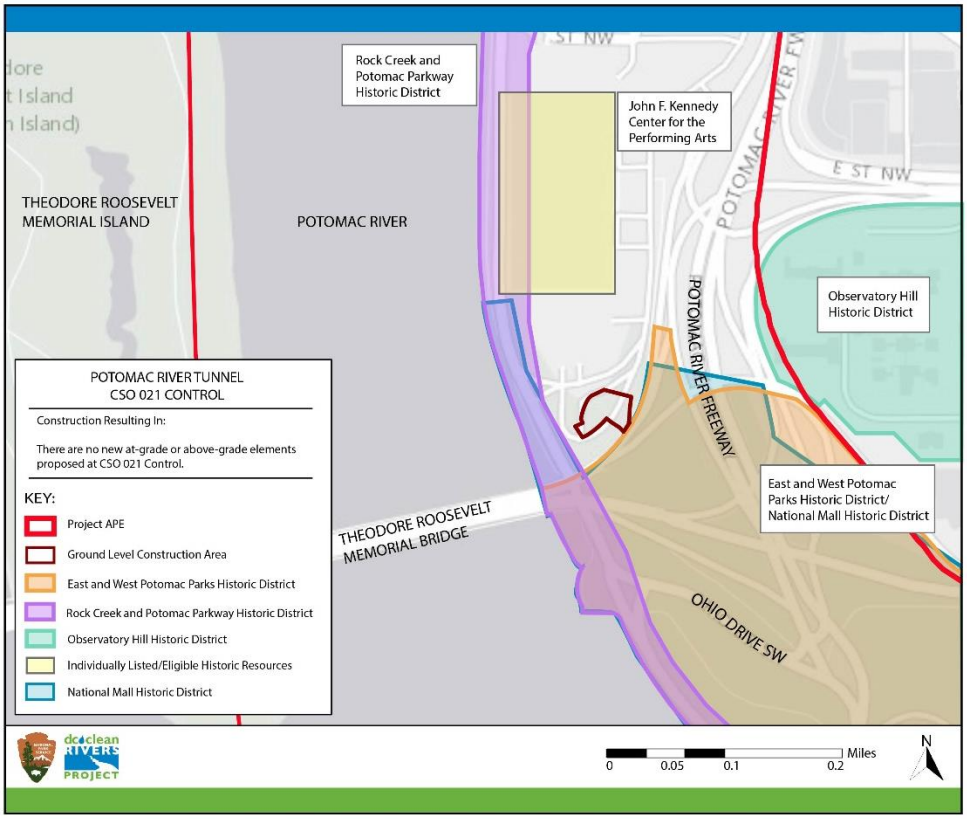

Figure 2-11: Component 6 – CSO 021 Control

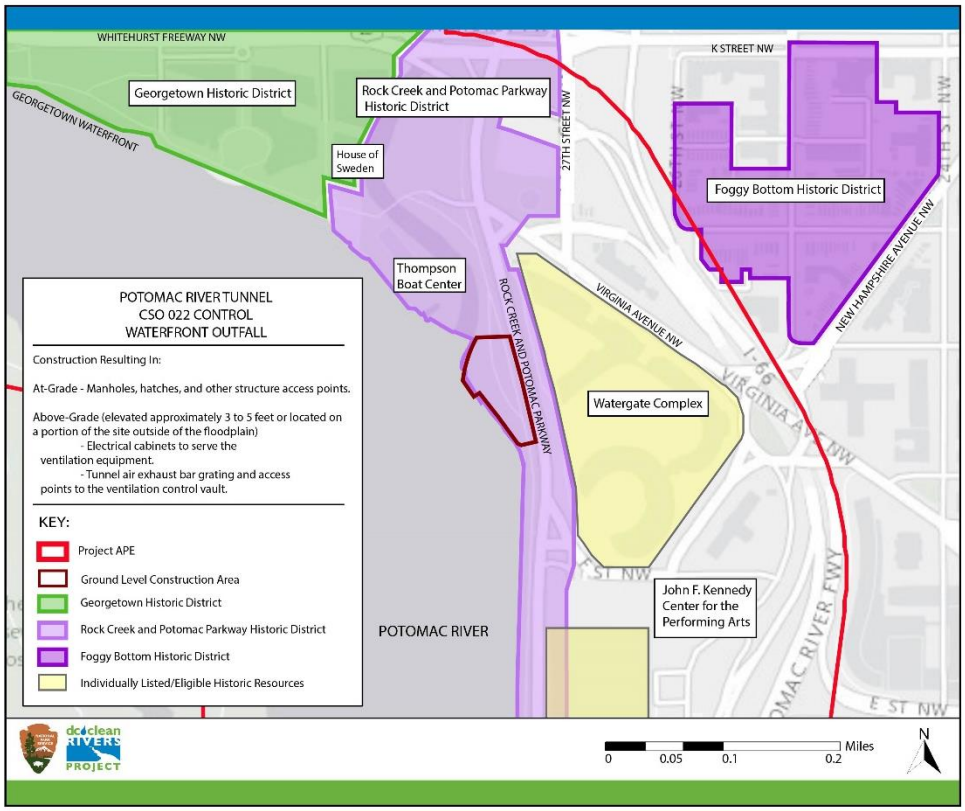

Figure 2-12: Component 7 – CSO 022 Control Option 1 – Waterfront/Existing Outfall

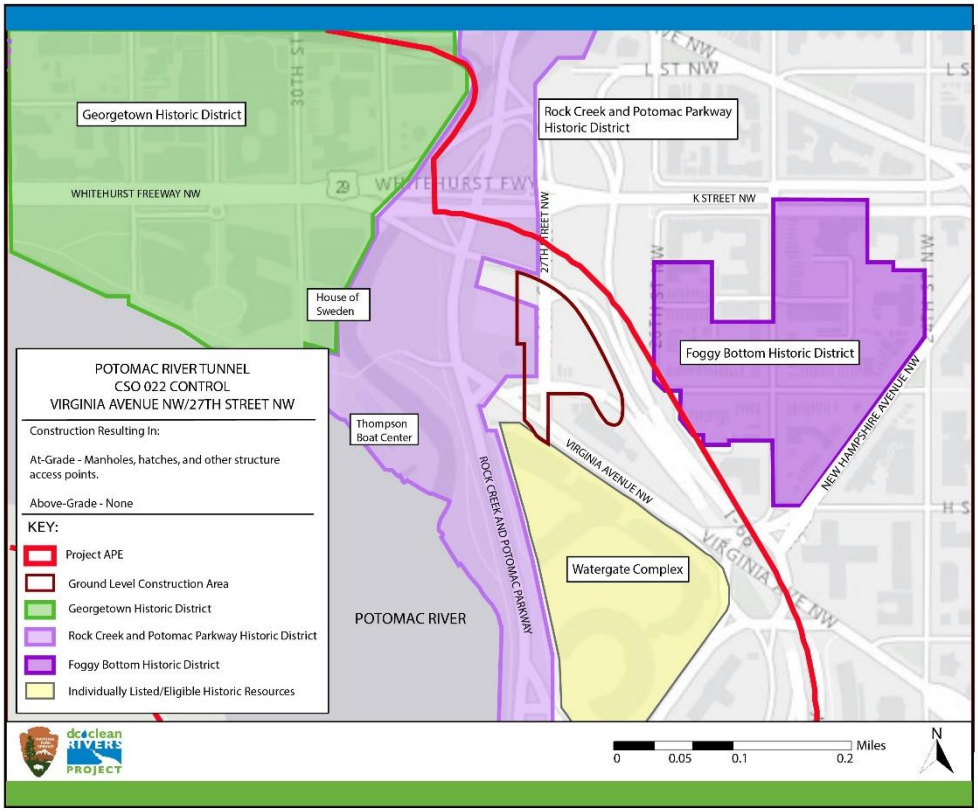

Figure 2-13: Component 7 – CSO 022 Control Option 2 – Virginia Avenue NW/27th St NW

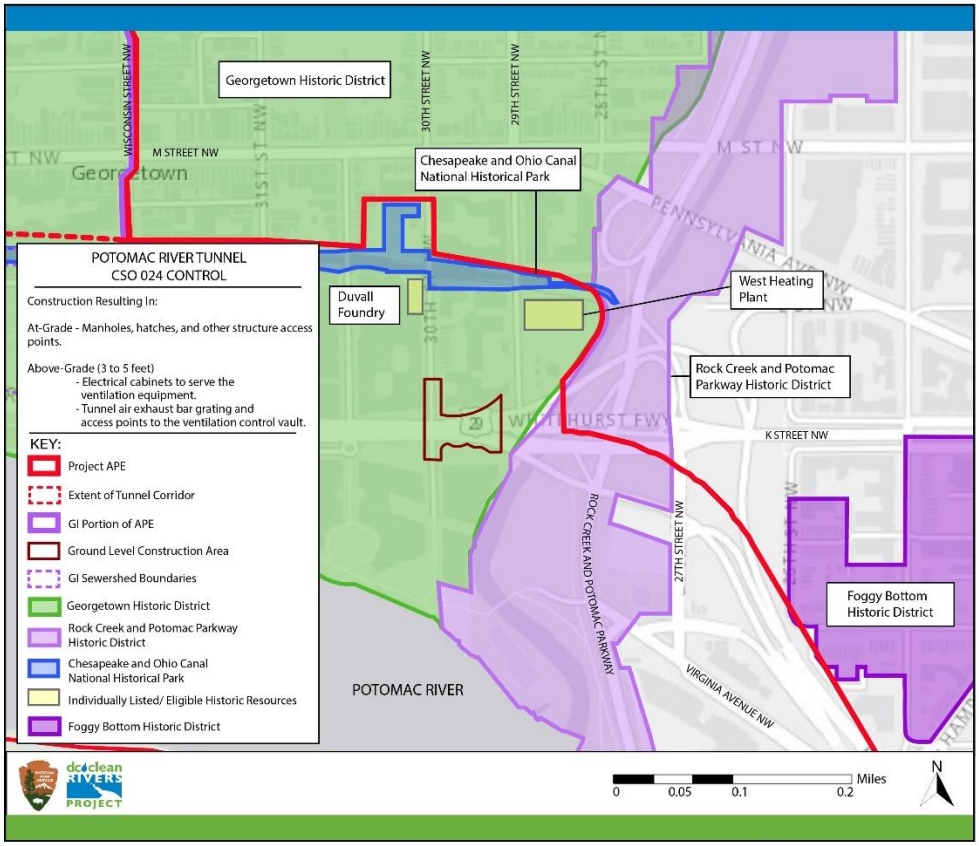

Figure 2-14: Component 8 – CSO 024 Control and UPI Diversion Structure

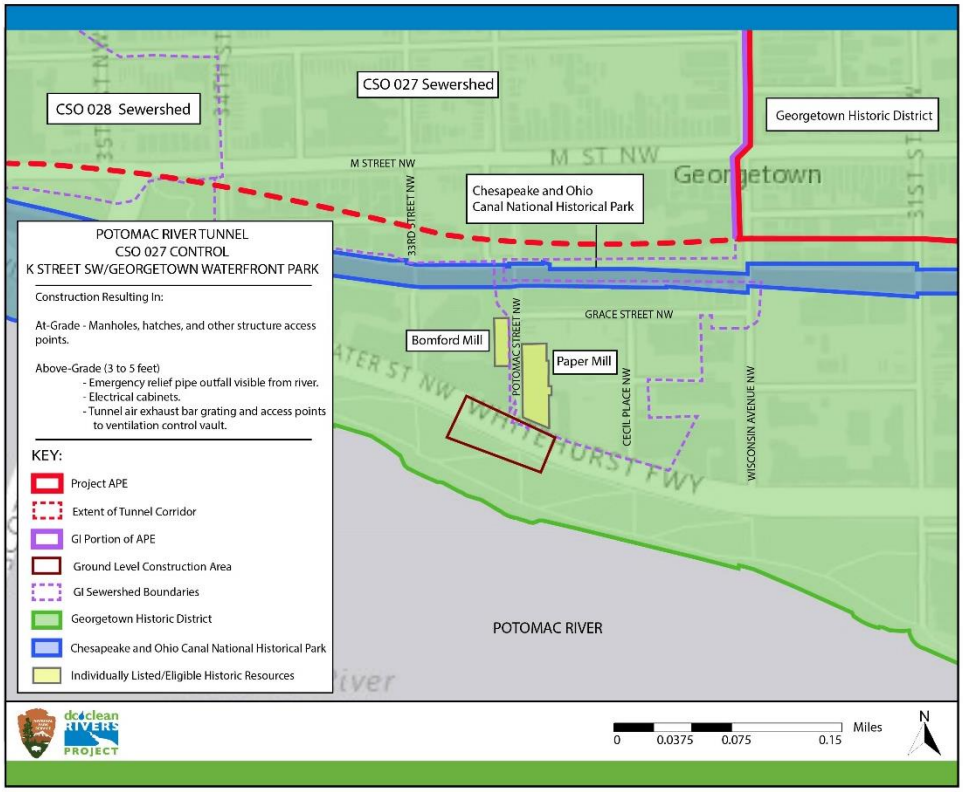

Figure 2-15: Component 9 – CSO 027 Control Option 1 – K St NW/Georgetown Waterfront Park (without the Emergency Surge Relief Pipe)

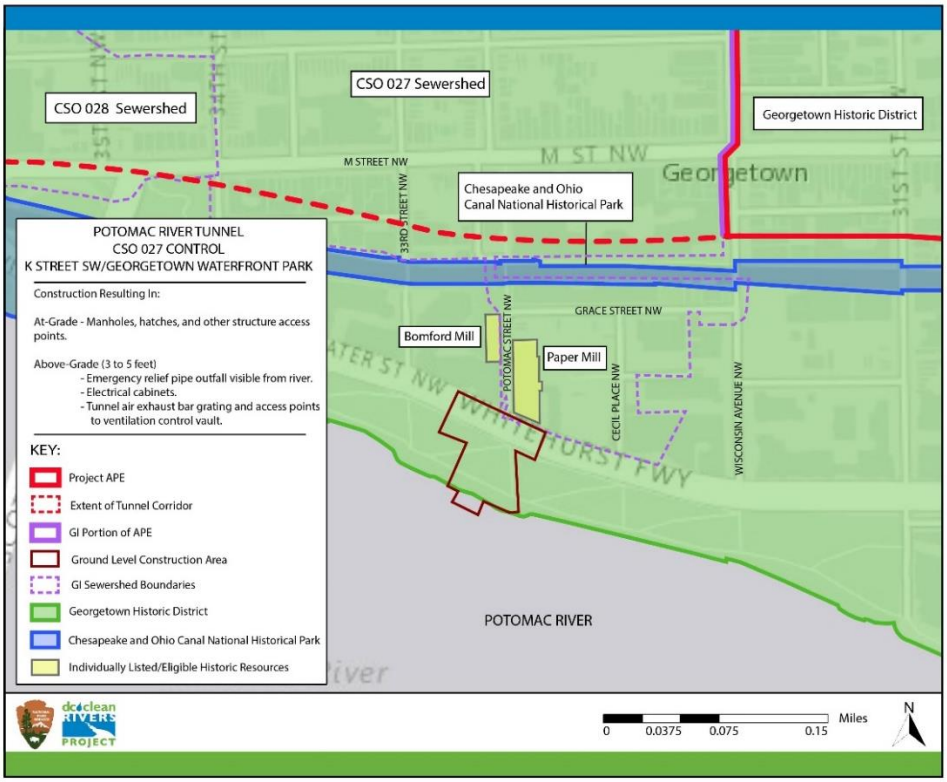

Figure 2-16: Component 9 - CSO 027 Control Option 1 - K Street NW/Georgetown Waterfront Park (with Emergency Surge Relief Pipe)

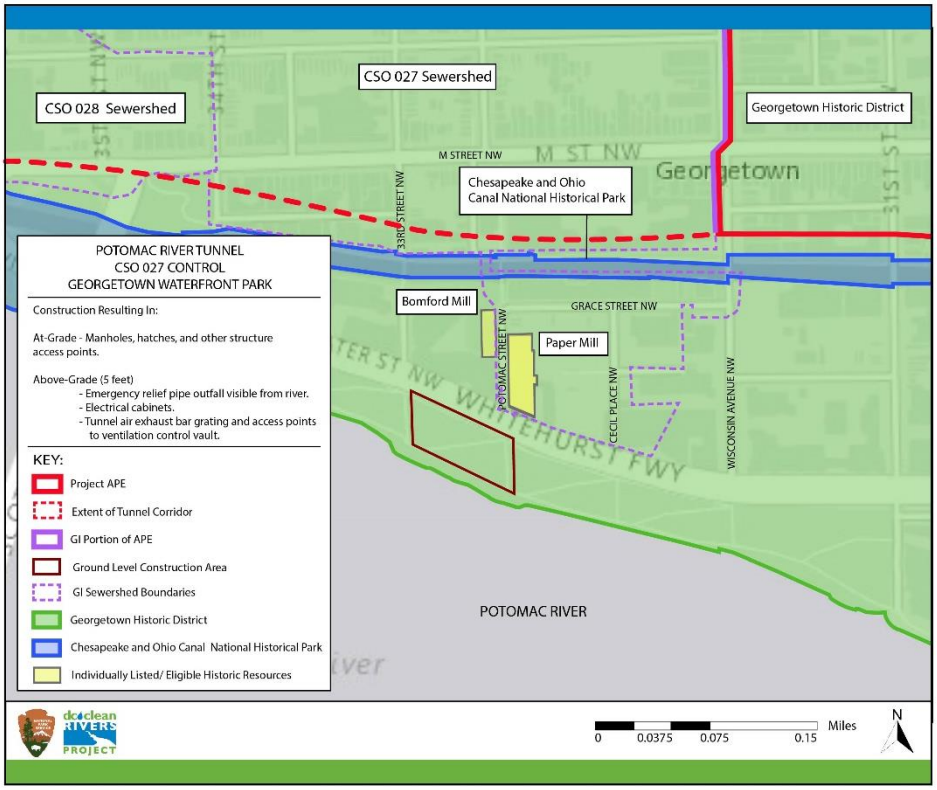

Figure 2-17: Component 9 – CSO 027 Control Option 2 – Georgetown Waterfront Park (without the Emergency Surge Relief Pipe)

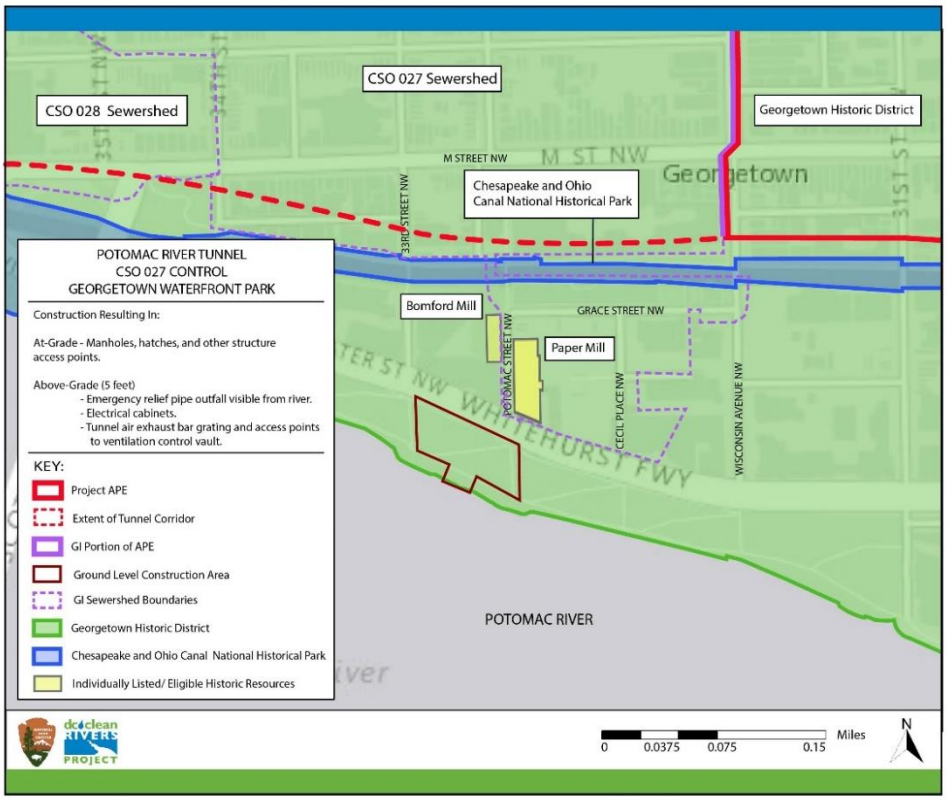

Figure 2-18: Component 9 - CSO Control Option 2 - Georgetown Waterfront Park (with Emergency Surge Relief Pipe)

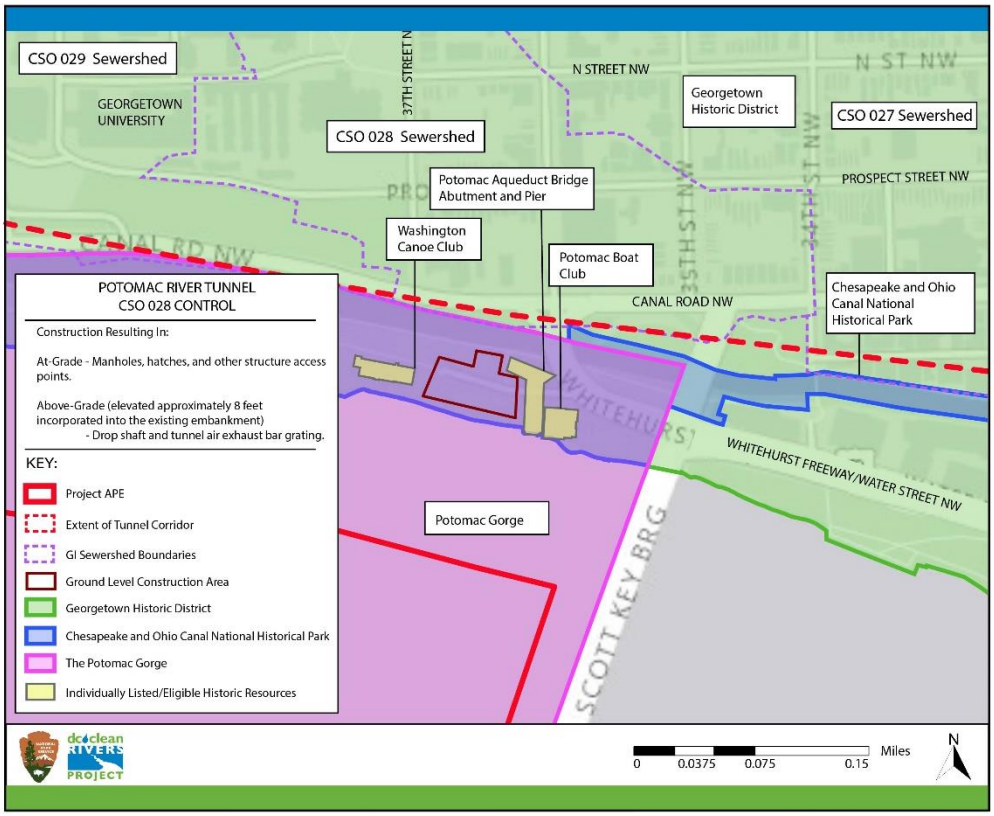

Figure 2-19: Component 10 – CSO 028 Control (without Emergency Surge Relief Pipe)

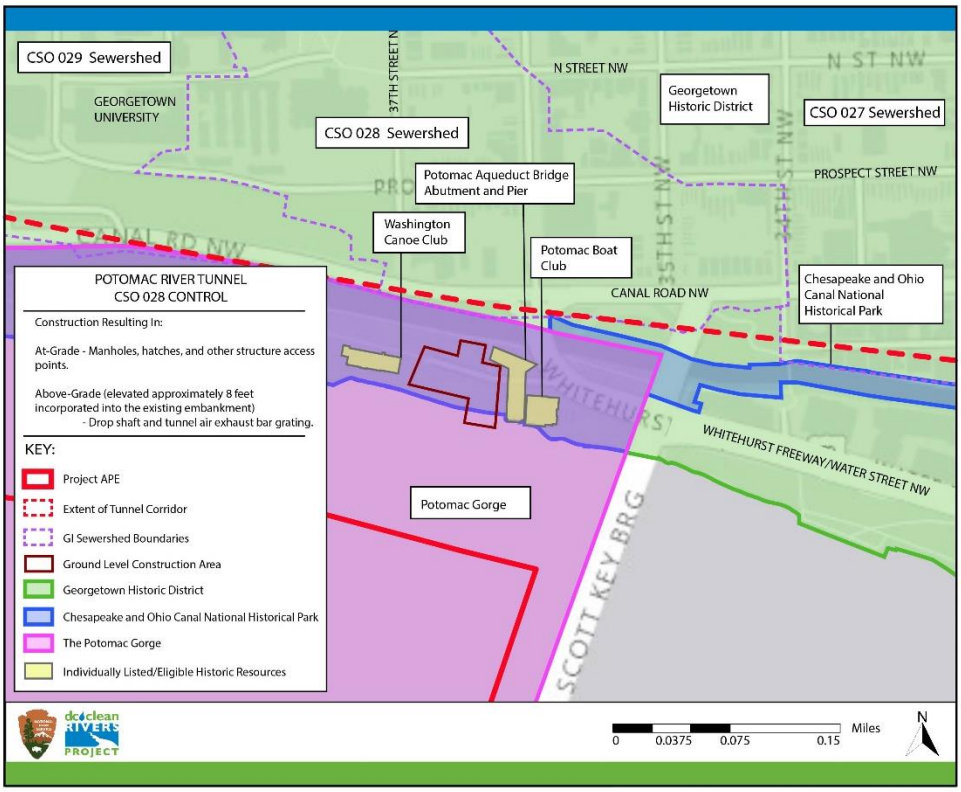

Figure 2-20: Component 10 - CSO 028 Control (with Emergency Surge Relief Pipe)

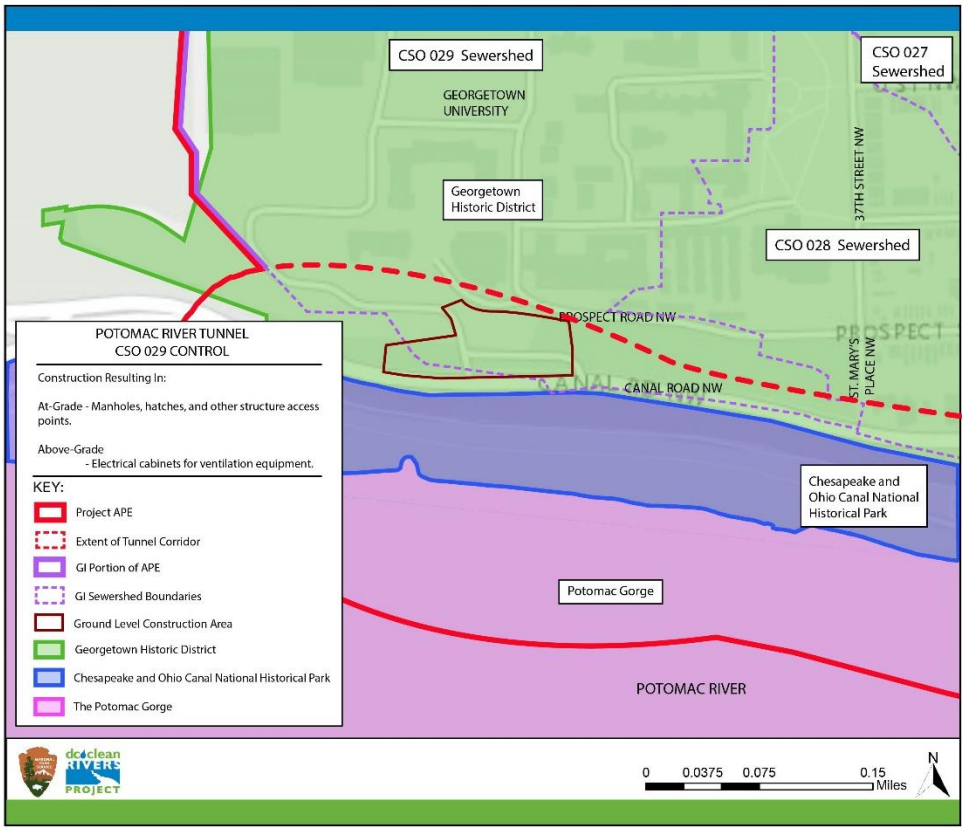

Figure 2-21: Component 11 – CSO 029 Control Option 1 – Canal Rd NW/Georgetown University Southwest Entrance

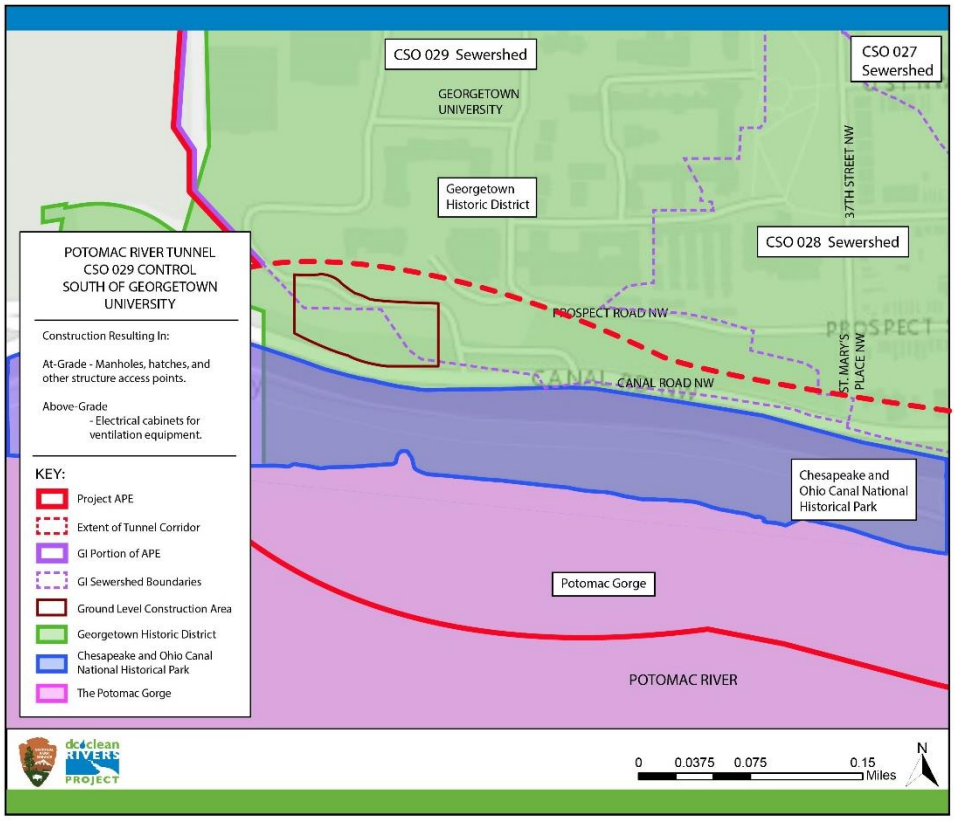

Figure 2-22: Component 11 - CSO 029 Control Option 2 – South of Georgetown University

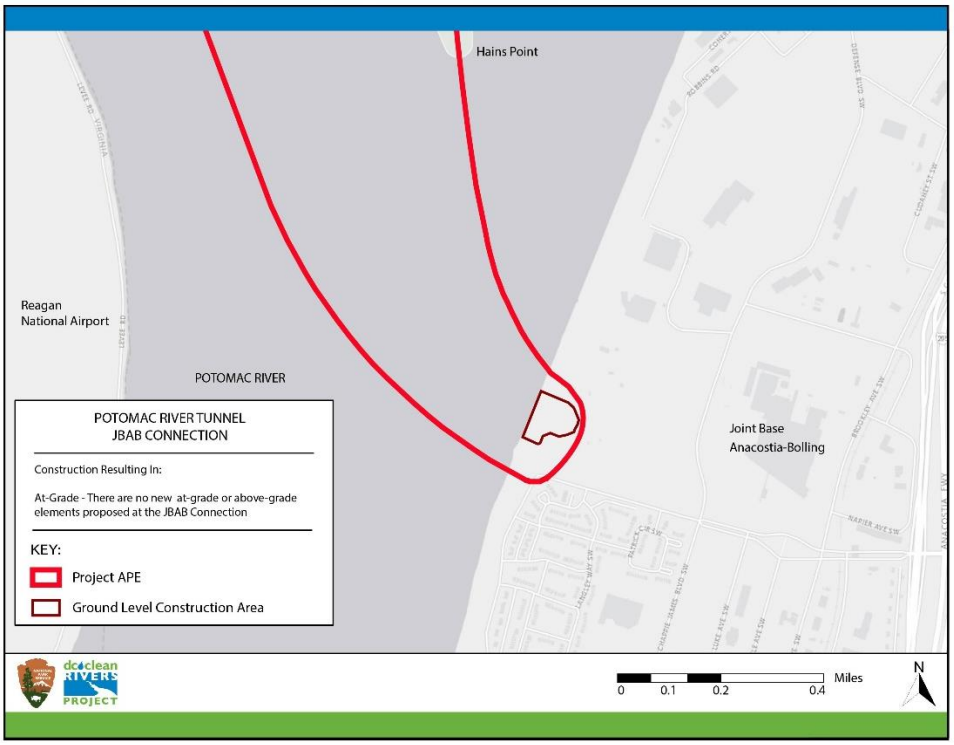

Figure 2-23: Component 12 – Tunnel Connection to Existing Shaft at JBAB

2.2 HISTORIC PROPERTIES WITHIN THE PROJECT AREA OF POTENTIAL EFFECT

Historic properties in the Project APE are listed in **Table 2-1**. This includes all historic districts, individually listed properties, and properties that have been determined eligible for listing in the National Register or the DC Inventory of Historic Sites (DC Inventory). Each property is numbered in the table to correspond with the Project APE provided on **Figure 2-1** and **Figure 2-2**. Included are all the historic properties that could potentially be adversely affected, directly or indirectly, temporarily or permanently, from implementation of the Potomac River Tunnel project. Note, that the historic properties within the GI portion of the Project APE are discussed in *Section 2.4* as the practicability of GI has yet to be determined.

Table 2-1: Historic properties within the Project APE

Number	Historic Property	Location	Designation	Period of Significance
N / A	The Plan of the City of Washington	Original boundaries of the Federal City	National Register (No. 97000332), DC Inventory	1790 – 1942
A	National Mall Historic District	Roughly bound by 3rd Street NW / SW to the east, Independence Avenue SW, Raoul Wallenberg Place SW, CSX Railroad, Potomac River to the south and west, and Constitution Avenue NW, 17th Street NW, White House Ground, and 15th Street NW to the north	National Register (No. 66000031), DC Inventory	1791 – present (Criterion A); 1791 – 1965 (Criterion C)
B	East and West Potomac Parks Historic District	Roughly bound by Constitution Avenue NW to the north, the Potomac River to the west, the Washington Channel to the south, and 17th Street NW to the east	National Register (No. 73000217), DC Inventory	1882 – 1997
C	Mount Vernon Memorial Highway	15.2-mile roadway that extends from Memorial Circle south to Mount Vernon	National Register (No. 81000079), DC Inventory, Virginia Landmarks Register	1929 – 1932
D	George Washington Memorial Parkway	Extends from Memorial Circle south to Mount Vernon, and north on both side of the Potomac River to the Capital Beltway	National Register (No. 95000605), Virginia Landmarks Register	1930 – 1966

Number	Historic Property	Location	Designation	Period of Significance
E	Arlington National Cemetery Historic District	One Memorial Avenue, Arlington, Virginia	National Register (No. 14000146)	1964 – Present
F	Rock Creek and Potomac Parkway Historic District	Along the Potomac River and Rock Creek from the Lincoln Memorial to the National Zoo	National Register (No. 05000367), DC Inventory	1828 – 1951
G	Observatory Hill Historic District	23rd and E Streets NW	National Register (No. 100000479), DC Inventory	1844 – 1961
H	Theodore Roosevelt Island National Memorial (Analostan Island)	Potomac River west of Georgetown Channel	National Register (No. 66000869), DC Inventory, National Monument (NM)	1749 – 1833; 1861 – 1865; 1931 – Present
I	Foggy Bottom Historic District	Roughly bound by 25th Street NW to the east, New Hampshire Avenue NW and H Street NW to the south, 26th Street NW to the west, and K Street NW to the north	National Register (No. 87001269), DC Inventory	1870 – 1911
J	Georgetown National Historic Landmark District	Roughly bound by Reservoir Road NW and Dumbarton Oaks Park to the north, Rock Creek Park to the east, the Potomac River to the south, and Glover-Archbold Parkway to the west	National Register (No. 67000025), DC Inventory, National Historic Landmark (NHL)	1751 – 1950
K	C&O Canal NHP	Georgetown extending west from Rock Creek	National Register (No. 66000036), DC Inventory, NM, Contributes to Georgetown NHL District, Contributes to Potomac Gorge	9000 BCE-1500 CE; 1928 – 1924; 1938 – 1942; 1964 – 1965
L	The Potomac Gorge	Potomac River upstream from the Francis Scott Key Bridge	DC Inventory	18th – 19th cent.
1	Lady Bird Johnson Park	157-acre island located in the District of Columbia along the west shore of Potomac River, directly across from West Potomac Park in Washington, D.C.	Determined eligible for listing in the National Register	1915 – 1979
2	Cuban Friendship Urn	Reservation 332, Ohio Drive at 14th Street Bridge SW, in West Potomac Park	National Register (No. 07001053), DC Inventory, Contributes to East & West Potomac Parks Historic District	1928
3	Thomas Jefferson Memorial	Southeast side of Tidal Basin, bounded by Ohio Drive SW to east, East Basin Drive SW to south	National Register (No. 66000029), DC Inventory, Contributes to East & West Potomac Parks Historic District	1947
4	Franklin Delano Roosevelt Memorial	West Potomac Park, west end of Tidal Basin	National Register (No. 01000271), Contributes to East & West Potomac Parks Historic District	1997
5	Martin Luther King, Jr. Memorial	West Potomac Park, south of Independence Avenue SW	Contributes to East & West Potomac Parks Historic District	2011
6	Auditor's Complex (Bureau of Engraving and Printing)	231 14th Street SW	National Register (No. 78003051), DC Inventory	1878 - 1912
7	Korean War Veterans Memorial	West Potomac Park, north of Independence Avenue SW	Contributes to East & West Potomac Parks Historic District	1995
8	Arlington Memorial Bridge (and Related Features)	Spans the Potomac River on the axis between the Lincoln Memorial in Washington, DC and Arlington House in Arlington, VA	National Register (No. 80000346), DC Inventory, Contributes to East & West Potomac Parks Historic District	1926 – 1932

Number	Historic Property	Location	Designation	Period of Significance
9	Lincoln Memorial (Statue of Lincoln)	West Potomac Park within Lincoln Memorial Circle NW	National Register (No. 66000030), DC Inventory, Contributes to East & West Potomac Parks Historic District	1912 – 1922
10	John F. Kennedy Center for the Performing Arts	2700 F Street NW	Determined eligible for listing in the National Register	1964 – Present
11	Watergate Complex	2500, 2600, 2650, and 2700 Virginia Avenue NW; 600 and 700 New Hampshire Avenue NW	National Register (No. 05000540), DC Inventory	1964 – 1972
12	Francis Scott Key Bridge	Over the Potomac River, connects Georgetown in Washington, DC to Rosslyn in Arlington County, Virginia	National Register (No. 96000199), DC Inventory, Virginia Landmarks Register	1917 – 1939
13	Dodge Warehouses (and Adjacent Structures)	1000-1006, 1008, and 1010 Wisconsin Avenue NW, and 3205 K Street NW	DC Inventory, Contributes to Georgetown NHL District	Late-18th – 19th cent.
14	Brickyard Hill House	3134-3136 South Street NW	DC Inventory, Contributes to Georgetown NHL District	c. 1800
15	Grace Church (Grace Protestant Episcopal Church)	1041 Wisconsin Avenue NW	National Register (No. 71001001), DC Inventory, Contributes to Georgetown NHL District	c. 1866 – 1895
16	Duvall Foundry	1050 30th Street NW	DC Inventory, Contributes to Georgetown NHL District	c. 1856 – c. 1870
17	West Heating Plant	1051 29th Street NW	DC Inventory, Contributes to Georgetown NHL District	1942 – 1968
18	Henry McCleery House	1068 30th Street NW	DC Inventory, Contributes to Georgetown NHL District	c. 1800
19	District of Columbia Paper Manufacturing Company (Paper Mill)	3255-3259 K Street NW	DC Inventory, Contributes to Georgetown NHL District	1900 – 1902
20	Bomford Mill (Pioneer Flour Mills)	3261 K Street NW	DC Inventory, Contributes to Georgetown NHL District	1845 – 1922
21	Potomac Boat Club	3530 Water Street NW	National Register (No. 91000786), DC Inventory, Contributes to Georgetown NHL District, Potomac Gorge	1908 – 1941
22	Potomac (Alexandria) Aqueduct Bridge Abutment and Pier	Potomac River west of Key Bridge	DC Inventory	1833 – 1962
23	Washington Canoe Club	3700 K Street NW	National Register (No. 90002151), DC Inventory, Contributes to Georgetown NHL District, Potomac Gorge	1904 – 1939
24	Wisconsin Avenue Bridge (High Street Bridge)	Wisconsin Avenue over the C&O Canal	DC Inventory, Contributes to Georgetown NHL District	1831

2.3 HISTORIC PROPERTIES IN THE GROUND LEVEL CONSTRUCTION AREAS WITHIN THE PROJECT AREA OF POTENTIAL EFFECT

The Ground Level Construction Areas are within the following large, historic districts and national parks. No individually listed historic properties are within the construction areas. As the Project APE is so large, the limits of construction at and above the ground surface have been highlighted to assess potential direct and indirect effects at each construction site within the Project APE. The identified resources have the potential to be directly adversely affected by

ground level construction, temporary or permanent, from work associated with the Potomac River Tunnel project. Most of the at- and above-grade infrastructure would be constructed within the existing boundaries of National Register-listed historic properties.

The Plan of the City of Washington
Location: Original boundaries of the Federal City
Period of Significance: 1790 – 1942
Designation: DC Inventory, 1964, expanded 1997; National Register, 1997

The Plan of the City of Washington is the only example of a comprehensive baroque city plan in the United States, composed of a system of radiating avenues, parks, and vistas superimposed on an orthogonal street grid. The Plan, as depicted in **Figure 2-24**, encompasses the original limits of the Federal City, stretching from Buzzard's Point to the south, Rock Creek to the west, the Anacostia River to the east and Florida Avenue (originally known as Boundary Street) to the north. Purposefully designed as the nation's capital, the political role of the city is physically expressed through the commemorative and symbolic location of buildings, structures, and vistas.

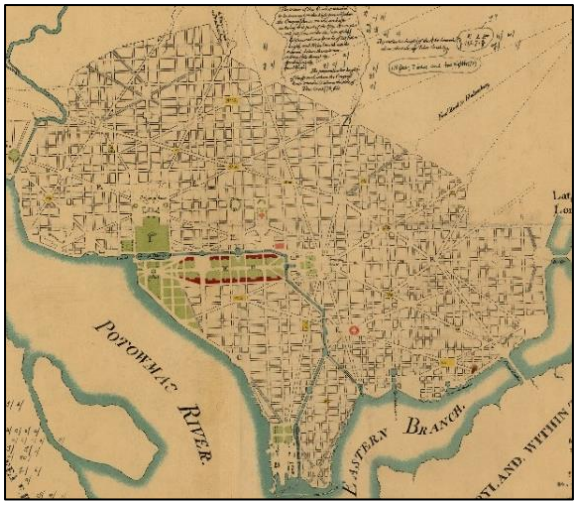

Figure 2-24: Detail, L'Enfant Plan Facsimile, 1887 (Library of Congress 1887)

Originally designed by Pierre Charles L'Enfant, the plan was influenced by the designs of several European cities and eighteenth-century gardens. Thereafter, the plan was further modified and improved, most notably by the Senate Park Commission in 1901. The plan created by the Senate Park Commission, also commonly referred to as the McMillan Commission, employed City Beautiful tenets to L'Enfant's original plan, creating the most elegant example of the style in the nation. The 1901 plan magnified and expanded the original plan for the capital city, which included the reclamation of land for waterfront parks, parkways, and improved Mall, and new monuments and vistas (Leach and Barthold 2009; DC SHPO 2009). Key character-defining features are the wide avenues and street grid, as well as the large and small parks, or reservations, created by that grid.

National Mall Historic District
Location: Bound by 3rd Street NW/SW to the east, Independence Avenue SW, Raoul Wallenberg Place SW, CSX Railroad, Potomac River to the south and west, and Constitution Avenue NW, 17th Street NW, White House Ground, and 15th Street NW to the north
Period of Significance: 1791 – present (Criterion A); 1791 – 1965 (Criterion C)
Designation: DC Inventory, 1964; National Register, 1966; expanded 2016

The National Mall Historic District is significant under Criteria A and C for politics and government, entertainment and recreation, ethnic heritage, education, social history, architecture, art, community planning, and landscape architecture. The historic district is significant for its relationship to the permanent establishment of the United States capital in Washington, DC, and its continued use as the nation's "front yard," as a gathering place for Americans to celebrate and/or protest a range of political, social, economic, and military issues, among others.

The historic district was recently expanded to the west with a boundary that now reaches the Potomac River and is approximately 693 acres and encompasses a total of 144 resources, 110 of which are considered contributing buildings, sites, structures, or objects. The entire National Mall is characterized by a range of different spaces: open lawn and park

land, designed landscapes and gardens, public museums, one of which is shown in **Figure 2-25**, public recreation spaces including softball fields and volley ball courts, and national monuments. Nationally significant under Criteria A and C, the district has a period of significance which begins in 1791 with the establishment of the District of Columbia as the capital and the development of the city's L'Enfant Plan, and continues through to the present day to include ongoing recent social and political events. (Robinson, Gasparini, and Kerr 2016)

Figure 2-25: View of the Smithsonian Castle, a contributing resource to the National Mall Historic District

East and West Potomac Parks Historic District
Location: Roughly bound by Constitution Avenue NW to the north, the Potomac River to the west, the Washington Channel to the south, and 17th Street NW to the east
Period of Significance: 1882 – 1997
Designation: DC Inventory, 1964; National Register, 1973, revised 2001

The East and West Potomac Parks Historic District encompasses a substantial portion of the monumental core of the District and provide recreational space for the public. The parks' lands were created by a 30-year reclamation project by the U.S. Army Corps of Engineers. Beginning in 1882, the project created approximately 730 acres of land enclosed by stone seawalls along the Potomac River. An 1897 Act of Congress reserved the reclaimed land for recreational use.

The plan for the parks was a primary feature of the McMillan Plan of 1901, a plan for the city created by the Senate Parks Commission based on City Beautiful design principles. The parks are characterized by large swaths of open land framed by mature landscape plantings and historic boulevards and drives. The parks serve as the setting for various memorials and landscape features including the Lincoln Memorial and Reflecting Pool, the Jefferson Memorial, the Franklin Delano Roosevelt Memorial, the Vietnam Veterans Memorial, the Martin Luther King Jr. Memorial, and the Tidal Basin, among others. One character-defining feature is Ohio Drive SW, which rings the outside of the reclaimed land, shown in **Figure 2-26**, allowing free public access to the entire park. Other character-defining features include the wide-open spaces of the parks, as well as the recreational fields and courts, including a golf course, volleyball courts, softball fields, and rugby fields. The parks are significant in the areas of architecture, art, city planning, commemoration, engineering, entertainment/recreation, landscape architecture, politics/government, social history, and transportation (Bobeczko and Robinson 1998).

Figure 2-26: Ohio Drive SW along East and West Potomac Parks Historic District

East and West Potomac Parks are divided by the Tidal Basin. East Potomac Park, located to the east of the Tidal Basin, contains the Thomas Jefferson Memorial, NPS National Capital Region Headquarters, East Potomac Park Golf Course, and Hains Point. West Potomac Park, located to the west of the Tidal Basin, contains the Franklin Delano Roosevelt Memorial, Martin Luther King, Jr. Memorial, DC War Memorial, Korean War Veterans Memorial, Lincoln Memorial, World War II Memorial, Vietnam Veterans Memorial, and Constitution Gardens.

Rock Creek and Potomac Parkway Historic District
Location: Along the Potomac River and Rock Creek from the Lincoln Memorial to the National Zoo
Period of Significance: 1828 – 1951
Designation: DC Inventory, 1964; National Register, 2005

Rock Creek and Potomac Parkway Historic District is a scenic parkway that connects the Zoological Park to West Potomac Park. Originally conceived in the late-nineteenth and early twentieth centuries as a scenic drive for carriages, equestrians, and pedestrians, by the time of the parkway's construction in the 1920s and 1930s its design had been altered to accommodate the automobile. The first official plan for the parkway was developed as part of the Senate Park Commission's 1902 report: *The Improvement of the Park System of the District of Columbia*. In 1913, Congress passed legislation authorizing the parkway, the first in the District metropolitan region and one of the earliest in the United States. However, due to problems with funding and land acquisition, construction of the parkway did not begin until the 1920s and was substantially completed by the 1930s. One of the major features of the historic district is the Rock Creek Park Trail, shown in **Figure 2-27**, which connect trails in upper Rock Creek Park with the National Mall and is a character-defining feature of the scenic parkway.

Figure 2-27: Rock Creek and Potomac Parkway Historic District

Georgetown National Historic Landmark District
Location: Roughly bound by Reservoir Road NW and Dumbarton Oaks park to the north, Rock Creek Park to the east, the Potomac River to the south, and Glover-Archbold Parkway to the west
Period of Significance: 1751 – 1950
Designation: DC Inventory, 1964; NHL, 1967; National Register, 1967, amended, 2003

Georgetown was established in 1751 by an Act of the Maryland Assembly. In 1789, the town was incorporated with an elected government, and became a part of the District of Columbia when it was established in 1791. Congress revoked Georgetown's independent charter in 1871 and abolished Georgetown as a legal entity in 1895.

The historic district encompasses the original port town that was laid out in 1751 and was later absorbed into the City of Washington. The historic district stands as a largely intact surviving example of a historic town with a grid plan with narrow streets which combined to create a patchwork of historic streetscapes. Another prominent character-defining feature of Georgetown is the Chesapeake and Ohio Canal, which runs through the southern end of Georgetown.

Figure 2-28: Georgetown Car Barn on M Street NW

Many of the District's oldest buildings are located within the historic district. Georgetown has a variety of residential, commercial, institutional, and industrial buildings designed in a variety of architectural styles including Federal, Greek Revival, Italianate, Queen Anne, Romanesque, and Classical Revival, as well as several vernacular structures which elevates the district to a NHL (DC SHPO 2009; Williams 2003). **Figure 2-28** above shows the Georgetown Car Barn at 3600 M Street NW constructed in 1905 alongside 3509 M Street NW, which dates to 1890. Some of the more prominent

character-defining features are a part of the streetscapes of the historic district, including, but not limited to, cobble stone streets, remnants of trolley tracks, brick sidewalks, and tree boxes.

Chesapeake and Ohio Canal National Historical Park
Location: Georgetown, extending west from Rock Creek
Period of Significance: 9000 BCE-1500 CE; 1928 – 1924, C & O Canal built and operated; 1938 – 1942, New NPS Initiatives & Civilian Conservation Corps Program; 1964 – 1965, Mission 66
Designation: NM, 1961; DC Inventory, 1964; National Register, 1966, revised 2015

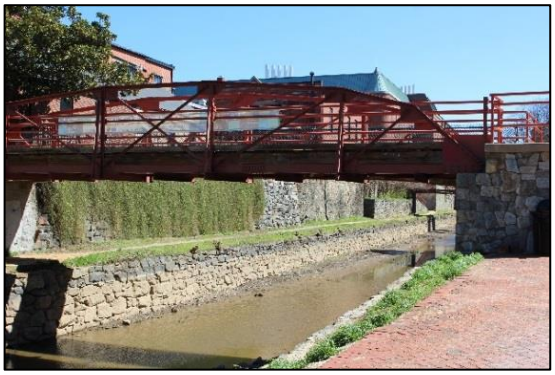

Figure 2-29: Chesapeake and Ohio Canal National Historical Park Historic District

Constructed between 1828 and 1850, the C&O Canal NHP is a linear historic district that extends from Georgetown, in the District, to Cumberland in western Maryland, and encompasses 20,526 acres along the Potomac River. The National Historical Park is significant for its important associations with the history of transportation and engineering in the United States, as well as reflecting significant trends in local and statewide architectural, commercial, military, agriculture, industrial, community development, conservation, ethnic heritage, and recreational history. The C&O Canal NHP, shown in **Figure 2-29**, is also significant as it contains several individually listed prehistoric and historic archaeological sites of state and local significance (Salvatore and Potter 2014). A few of the character-defining features include the bridges, boat houses, locks, pathways, and stone walls found throughout the park.

The Potomac Gorge (The Potomac Palisades)
Location: Potomac River upstream from Francis Scott Key Bridge
Designation: DC Inventory, 1964

Figure 2-30: Capital Crescent Trail within Potomac Gorge, C&O Canal NHP, and Georgetown Historic District

The Potomac Gorge is situated at the opening of the valley where the Potomac breaks over the fall line from the Piedmont uplands onto the coastal plain. The area is known for being the site of the Federal City; it was selected for political, practical, and aesthetic reasons. The Potomac Gorge has been preserved in its natural state since the time of the McMillan Plan (DC SHPO 2009). While there have been modern improvements, especially towards the southern terminus, including boat houses and trails, as shown in **Figure 2-30**, a majority of the coastline of the Potomac River within the Potomac Gorge has been preserved in its natural state.

2.4 HISTORIC PROPERTIES WITHIN THE GREEN INFRASTRUCTURE PORTION OF THE AREA OF POTENTIAL EFFECT

Historic properties within the GI portion of the Project APE are listed in **Table 2-2**. Each resource is numbered in the table to correspond with the detailed GI portion of the Project APE map provided as **Figure 2-2**. Included are all the historic districts, individually listed properties, and properties that have been determined eligible for listing in the National Register or DC Inventory that could potentially be adversely affected, directly or indirectly, temporarily or permanently, from GI implementation within the CSO 027, 028, and 029 sewersheds. For conservatism, all properties within the GI sewersheds have been included; however, not all will be affected pending final siting of GI facilities.

Table 2-2: Historic properties within the GI portion of the Project APE

Number	Historic Property	Sewershed	Location	Designation	Period of Significance
J	Georgetown National Historic Landmark District	027, 028, 029	Roughly bound by Reservoir Road and Dumbarton Oaks park to the north, Rock Creek Park to the east, the Potomac River to1990 the south, and Glover-Archbold Parkway to the west	National Register (No. 67000025), NHL, DC Inventory	1751 – 1950
K	C&O Canal NHP	027, 028, 029	Georgetown extending west from Rock Creek	National Register (No. 66000036), DC Inventory, NM, Contributes to Georgetown NHL District, Contributes to Potomac Gorge	9000 BCE-1500 CE; 1928 – 1924; 1938 – 1942; 1964 – 1965
L	The Potomac Gorge (Potomac Palisades)	028, 029	Potomac River upstream from the Francis Scott Key Bridge	DC Inventory	18th – 19th cent.
M	Glover-Archbold Park	029	Foundry Branch from Potomac River to Van Ness Street NW	National Register (No. 06001260), DC Inventory	1890 – 1943
N	Georgetown Visitation Convent and Preparatory School	027, 029	1524 35th Street NW	National Register (No. 900002146), Contributes to Georgetown NHL District	1819 – 1932
O	Washington Cathedral Historic District	029	Wisconsin Avenue at Massachusetts Avenue NW	National Register (No. 74002170), DC Inventory	1907 – 1990
12	Francis Scott Key Bridge	028	Over the Potomac River, connects Georgetown in Washington, DC to Rosslyn in Arlington County, Virginia	National Register (No. 96000199), DC Inventory, Virginia Landmarks Register	1917 – 1939
19	District of Columbia Paper Manufacturing Company (Paper Mill)	027	3255 – 3259 K Street NW	DC Inventory, Contributes to Georgetown NHL District	1900 – 1902
20	Bomford Mill (Pioneer Flour Mills; Flour Mill)	027	3261 K Street NW	DC Inventory, Contributes to Georgetown NHL District	1845 – 1922
24	Wisconsin Avenue Bridge (High Street Bridge)	027	Wisconsin Avenue over the C&O Canal	DC Inventory, Contributes to Georgetown NHL District	1831
25	Vigilant Firehouse	027	1066 Wisconsin Avenue NW	National Register (No. 71001008), DC Inventory, Contributes to Georgetown NHL District	1844 – 1883
26	Old Engine Company No. 5 (Bank of Columbia, Georgetown Town Hall & Mayor's Office)	027	3210 M Street NW	DC Inventory, Contributes to Georgetown NHL District	1796 – 1946
27	City Tavern	027	3206 M Street NW	National Register (No. 91001489), DC Inventory, Contributes to Georgetown NHL District	1796 – 1875
28	Georgetown Commercial Buildings, M Street and Wisconsin Avenue	027	2919, 3068, 3056, 3072, 3112, 3116 M Street NW & 1218, 1219, 1221, 1249, 1304, 1515, 1517, 1522, 1524, 1527, & 1529 Wisconsin Avenue NW	DC Inventory, Contributes to Georgetown NHL District	c. 1780 – 1820
29	Georgetown Market	027	3276 M Street NW	National Register (No. 71001000), DC Inventory, Contributes to Georgetown NHL District	1865

Number	Historic Property	Sewershed	Location	Designation	Period of Significance
30	Joseph Carleton House	027	1052 – 1054 Potomac Street NW	DC Inventory, Contributes to Georgetown NHL District	c. 1794
31	Forrest-Marbury House	027	3350 M Street NW	DC Inventory, National Register (No. 73002084), Contributes to Georgetown NHL District	1788 – 1790
32	Halcyon House (Benjamin Stoddert House)	028	3400 Prospect Street NW	National Register (No. 71001002), DC Inventory, Contributes to Georgetown NHL District	1787
33	Prospect House (Lingan-Templeman House)	028	3508 Prospect Street NW	National Register (No. 72001430), DC Inventory, Contributes to Georgetown NHL District	1788 – 1793
34	Quality Hill (John Thomson Mason House; Charles Worthington House)	027	3425 Prospect Street NW	National Register (No. 72001431), DC Inventory, Contributes to Georgetown NHL District	1797 – 1798
35	William Wilson Corcoran Store	027	1300 Wisconsin Avenue NW	DC Inventory, Contributes to Georgetown NHL District	1817
36	Barber-Caperton House (& Gazebo)	027	3233 N Street NW	DC Inventory, Contributes to Georgetown NHL District	c. 1813 – 1816; Gazebo c. 1830
37	St. John's Church, Georgetown	027	3240 O Street NW	DC Inventory, Contributes to Georgetown NHL District	Church, 1809; Rectory, 1875
38	Smith Row	027	3255 – 3267 N Street NW	DC Inventory, Contributes to Georgetown NHL District	c. 1815
39	Bodisco House (Clement Smith House)	027	3322 O Street NW	DC Inventory, Contributes to Georgetown NHL District	1815 – 1854
40	Cox's Row	027	3327 – 3339 N Street NW	DC Inventory, Contributes to Georgetown NHL District	c. 1817 – 1818
41	Smith-Bruce House	027	1405-11 34th Street NW	DC Inventory, Contributes to Georgetown NHL District	c. 1810
42	Old Holy Trinity Church (Convent of Mercy)	027	3513-15 N Street NW	DC Inventory, Contributes to Georgetown NHL District	c.1787 – 1794
43	Georgetown University Healy Hall	028, 029	37th and O Streets NW	National Register (No. 71001003), NHL, DC Inventory, Contributes to Georgetown NHL District	1879; 1899
44	Georgetown University, Old North	029	37th and O Streets NW	DC Inventory, Contributes to Georgetown NHL District	c. 1795 – 1797
45	Georgetown University, Astronomical Observatory	029	Georgetown University	National Register (No. 73002087), DC Inventory, Contributes to Georgetown NHL District	1841 – 1844
46	Foxall-McKenney House	027	3123 Dumbarton Avenue NW	DC Inventory, Contributes to Georgetown NHL District	1819
47	Christ Church (& Rectory)	027	3112 & 3116 O Street NW	National Register (No. 72001421), DC Inventory, Contributes to Georgetown NHL District	Church, 1885 – 1887; Rectory, c. 1810
48	Bowie-Sevier House	027	3124 Q Street NW	DC Inventory, Contributes to Georgetown NHL District	c. 1800 – 1805

Number	Historic Property	Sewershed	Location	Designation	Period of Significance
49	The Yellow House	027	1430 33rd Street NW	DC Inventory, Contributes to Georgetown NHL District	c.1800
50	The Yellow Tavern	027	1524 33rd Street NW	DC Inventory, Contributes to Georgetown NHL District	c. 1795
51	Volta Laboratory (Alexander Graham Bell Laboratory; Bell Carriage House)	027	3414 Volta Place NW	DC Inventory, Contributes to Georgetown NHL District	1854 - 1922
52	Alexander Melville Bell House	027	1527 35th Street NW	DC Inventory, Contributes to Georgetown NHL District	1854 – 1920
53	Georgetown Visitation Convent and Preparatory School – Monastery and Academy Building	027	1524 35th Street NW	DC Inventory, Contributes to Georgetown NHL District, Contributes to Georgetown Visitation Convent and Preparatory School	Mid-19th cent. - 1932
54	Georgetown Visitation Convent and Preparatory School – Chapel	027	1524 35th Street NW	DC Inventory, Contributes to Georgetown NHL District, Contributes to Georgetown Visitation Convent and Preparatory School	1821 – 1932
55	Volta Bureau	027	1537-41 35th Street NW (3417 Volta Place NW)	National Register (No. 0022080), NHL, DC Inventory, Contributes to Georgetown NHL District	1893 – 1922
56	Mackall-Worthington House	027	3406 R Street NW	DC Inventory, Contributes to Georgetown NHL District	1820
57	Western High School (Duke Ellington School of the Arts)	029	1698 35th Street NW	National Register (No. 03000673), DC Inventory	1898 – 1978
58	Western High School Field Houses	029	1700 38th Street NW	Determined eligible for listing in the National Register	1929 – 1932
59	Hillandale (Main Residence and Gatehouse)	029	3905 Mansion Court NW; 3905 Reservoir Road NW	National Register (No. 94001595), DC Inventory	1922 – 1968
60	Burleith Historic District	029	Whitehaven Parkway NW on the north, Reservoir Road NW on the south, 35th Street NW on the east, and 39th Street NW on the west	Determined eligible for listing in the National Register	1895 – 1939
61	Holy Rood Cemetery	029	2126 Wisconsin Avenue NW	Determined eligible for listing in the National Register	1832 – 1984
62	Whitehaven Parkway	029	Whitehaven Parkway between MacArthur Boulevard NW and Massachusetts Avenue NW	Determined eligible for listing in the National Register	1928 – 1950
63	Glover Park Historic District	029	Tunlaw Road NW on the north, Whitehaven Parkway and Holy Rood Cemetery on the south, Wisconsin Avenue NW on the east, Glover Archbold Park on the west	Determined eligible for listing in the National Register	1909 – 1955
64	Alban Towers (and Interiors)	029	3700 Massachusetts Avenue NW	National Register (No. 94001040), DC Inventory	1928 – 1929

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3.0 EXISTING CONDITIONS

The following section describes the existing conditions at each component proposed as part of the Potomac River Tunnel project. As part of the National Historic Preservation Act Section 106 process, this section of the AOE Report focuses on describing the existing conditions of the proposed areas of construction and identifies all character-defining features of the historic properties that fall within those limits of construction. Specifically, the character-defining features that contribute to the resources' integrity, including location, design, setting, materials, workmanship, feeling, and/or association.

3.1 DESCRIPTION OF POTOMAC RIVER TUNNEL

The Potomac River Tunnel stretches from JBAB to the south, generally along the east side of the Potomac River, to Georgetown University to the west. The tunnel corridor includes the National Mall Historic District, East and West Potomac Parks Historic District, Rock Creek and Potomac Parkway Historic District, Foggy Bottom Historic District, Georgetown Historic District, C&O Canal NHP, and the Potomac Gorge. The tunnel would be constructed within the limits of the APE for the overall project area but would be located 75 to 125 feet below the ground surface. Geotechnical borings, protection of structures, ground improvements, and monitoring equipment may be needed at the surface before and during tunnel construction.

The National Mall Historic District was recently expanded from the US Capitol at 3rd Street NW/SW, all the way west to the Potomac River, encompassing all West Potomac Park and its associated features. The district is characterized by a variety of different spaces, including but not limited to, designed landscapes and gardens, open lawn and park land, recreational fields, museums, and national monuments. The portion of the National Mall Historic District that falls within the APE is also the same portion of West Potomac Park that falls within the APE. For clarity, West Potomac Park will be the focus of the character-defining features described in this report, although National Mall features will also be considered.

East and West Potomac Parks Historic District encompasses a substantial portion of the monumental core of the National Mall. East and West Potomac Parks are divided by the Tidal Basin, with West Potomac Park being roughly bounded by Constitution Avenue NW to the north, the Potomac River to the west and south, 17th Street NW, and the Tidal Basin to the east. East Potomac Park is bound by the Tidal basin to the north, the Potomac River to south and west, and the Washington Channel to the north and east. The historic district, including both parks, is defined by its combination of national monuments, open spaces, and recreational playfields. The open spaces and fields are used year-round for special events and sporting activities such as golf, softball, volleyball, and soccer and are key character-defining features of the district. Groves and allies of trees provide shade and define the waterfront of the Potomac River and National Mall. Ohio Drive SW is a character-defining feature that allows visitors to access the entire historic district from the Lincoln Memorial to Hains Point. Critical viewsheds to and from East and West Potomac Parks include, but are not limited to, those across the Potomac River, from the George Washington Memorial Parkway, Arlington Cemetery, Lady Bird Johnson Park, and Memorial Bridge. Key character-defining features of the viewsheds to East and West Potomac Parks are the rough-cut, stone seawall constructed in 1911 when the parks were infilled, as well as the variety of trees along the waterfront, especially the approximately 1,800 Japanese Cherry trees planted between 1966 and 1968 at the direction of President Johnson. These specific cherry trees were planted around the Tidal Basin and the southern end of East Potomac Park at Hains Point. East and West Potomac Parks Historic District retains its character-defining features and there are no non-contributing features that detract from the historic district's integrity.

Rock Creek and Potomac Parkway Historic District stretches from the National Zoological Park to the north to the Potomac River to the south. Character-defining features of the district include Rock Creek and its surrounding natural vegetation, natural and manmade trails, including Rock Creek Trail, that allow visitors to explore a more natural setting, and larger intricately designed bridges that traverse the creek and its tributaries. Critical viewsheds to and from Rock Creek and Potomac Parkway include, but are not limited to, those across the Potomac River, from the George Washington Memorial Parkway, Theodore Roosevelt Island, Kennedy Center, and Francis Scott Key Bridge. The district retains its character-defining features and there are no non-contributing features that detract from the historic district's integrity.

The Georgetown National Historic Landmark District is roughly bound by Reservoir Road NW and Dumbarton Oaks Park to the north, Rock Creek Park to the east, the Potomac River to the south, and Glover-Archbold Parkway to the west. The historic district includes over 4,000 contributing structures and countless other character-defining features. Some of the character-defining features include structures built within the period of significance that stretches from 1751 to 1950, as well as multiple areas of significance, including architecture, commerce, entertainment/recreation, exploration/settlement, industry, transportation, and archaeology. This includes, but is not limited to, the cobble-stone roadways and streets, paved and bricked alleys, brick, stone, and concrete sidewalks, light posts, mailboxes, call boxes, fences and gates, bridges, and trolley rails. Overall, the Georgetown National Historic Landmark District has a high degree of integrity and significance. Critical viewsheds to and from the Georgetown National Historic Landmark District include, but are not limited to, those across the Potomac River, from the George Washington Memorial Parkway, Theodore Roosevelt Island, and Francis Scott Key Bridge. The district retains many of its character-defining features and though there are a few non-contributing features throughout the district, including but not limited to maintenance buildings, visitor information booths, and restrooms, they do not detract from the historic district's integrity.

C&O Canal NHP begins at mile marker zero at the mouth of Rock Creek and continues outside the District boundary north of Chain Bridge. The park is defined by the canal and towpath, as well as the locks, bridges, boat houses, stone walls, and vegetation surrounding the canal, all of which are character-defining features. C&O Canal NHP retains its character-defining features with few intrusions, including but not limited to contemporary bridges, utility structures, signage, and restrooms, to detract from the historic district's integrity and significance. Critical viewsheds to and from the C&O Canal NHP include, but are not limited to, those across the Potomac River, from the George Washington Memorial Parkway, the Potomac Gorge, and Francis Scott Key Bridge.

Archaeological Resources

The Potomac River Tunnel would be located between 75 and 125 feet below the current land surface, well below levels of human occupation. Construction of the tunnel at these depths has no potential to encounter archaeological resources (Kreisa et al. 2018).

3.2 DESCRIPTION OF GROUND LEVEL CONSTRUCTION AREAS

This section details the existing conditions and character-defining features at each Ground Level Construction Areas throughout the project area. This section also identifies the construction areas where archeological resources have been identified, or areas of archeological potential. A summary table of the results of the Phase IA assessment and Phase IB survey for the project, along with recommendations for further investigations, is provided as **Table 3-1** at the end of this section.

3.2.1 COMPONENT 2 – TUNNEL MINING SITE

There are two potential tunnel mining sites being considered for the proposed project. Both mining site options are located within the open recreational fields of West Potomac Park within the National Mall and East and West Potomac Parks Historic Districts. West Potomac Park encompasses a substantial portion of the monumental core of the National Mall and the historic district was listed in the DC Inventory in 1964 and the National Register in 1973, revised in 2001. West Potomac Park also contributes to the significance of the National Mall Historic District, which was listed in the DC Inventory in 1964, the National Register in 1966, and expanded in 2016. West Potomac Park is roughly bound by Constitution Avenue NW to the north, the Potomac River to the west and south, 17th Street NW and the Tidal Basin to the east. The first site is located to the north, directly south of Independence Avenue NW while the second is located south of the Franklin Delano Roosevelt Memorial.

3.2.1.1 Tunnel Mining Site Option 1 – West Potomac Park (North)

The approximately six-acre site is located within the softball fields of West Potomac Park and is generally confined by Independence Avenue SW, Ohio Drive SW, and West Basin Drive SW. This area is additionally addressed under Component 3 – Emergency Overflow Structure Option 1 – West Potomac Park (North), described in *Section 3.2.2.1*. The construction area is almost entirely flat, open lawn with approximately 11 trees, including two purple beech trees and nine American elm trees lining Ohio Drive SW along the southern boundary of the site. There are no cherry trees within this site. There is a rugby goal post located along a "desire" path between Independence Avenue SW and Ohio Drive SW that generally demarcates the western border of the construction area. A contemporary chain-link fence, seen in **Figure 3-1**, defines the northern border of the recreational space parallel to Independence Avenue SW between Ohio Drive SW and West Basin Drive SW. The eastern border of the site cuts through the open lawn and terminates at Ohio Drive SW, where a gravel access drive and contemporary metal access gate, seen in **Figure 3-2**, allows NPS to get trucks in and out of the former polo fields. This area has one holly tree, two American elm trees, and one willow tree. It is anticipated that ingress/egress to the construction area would be provided from Ohio Drive SW, as well as Independence Avenue SW.

Figure 3-1: Northern edge of proposed site, looking east

Figure 3-2: Southwest corner of proposed site, looking north

The construction area includes two of the polo fields, now used as softball fields, defined by the dirt in-fields and chain-link backstops. The open lawn is a character-defining feature of the historic districts as the land was created from fill with the original intention of providing free and open public recreational facilities for District residents and visitors to the National Mall, while the physical goal posts, chain-link backstops, and dirt in-fields themselves are not character-defining features. The landscape and trees along Ohio Drive SW are also character-defining features of West Potomac Park as they were planted to frame the roadway and provide shade to the adjacent, more active, open recreational areas.

Key character-defining viewsheds in this section of West Potomac Park include views north to the Lincoln Memorial, northeast to the Memorial Bridge, views east to the Washington Monument, views west and south to the Potomac River, and southeast to the open expanse of the rest of the softball fields in this location. Due to the landscape, other structures, and large trees, no other monuments are visible from the site, including the Jefferson Memorial, Martin Luther King, Jr. Memorial, or the Franklin Delano Roosevelt Memorial.

This portion of West Potomac Park continues to convey its significance. The area retains its character-defining features. There are non-contributing features, such as contemporary signage, manholes, and grating, but they do not detract from the area's integrity.

High voltage electricity distributions lines would be required to deliver power to the tunnel boring machine (TBM). Pending coordination with the Potomac Electric Power Company (PEPCO), power lines would be installed either along the public right-of way of Independence Avenue SW, or Ohio Drive SW and East Basin Drive SW. Independence Avenue SW provides three vehicular travel lanes in both the eastbound and westbound directions. The eastbound and westbound lanes are separated by a wide median. Independence Avenue SW crosses the Tidal Basin via the Kutz Bridge. Ohio Drive SW/East Basin Drive SW provides two vehicular travel lanes also in the eastbound and westbound directions. Within West Potomac Park, one lane is regularly used for parking, reducing eastbound Ohio Drive to one lane. Ohio Drive SW/East Basin Drive SW follows along the southern boundary of the Thomas Jefferson Memorial property and over the Inlet Bridge.

Archaeological Resources

There are no registered archaeological sites in West Potomac Park. West Potomac Park is located on late 19th-century "made-land" (Kreisa et al. 2018). However, a series of temporary World War II-era structures are depicted within the area on maps and in photographs dating between 1945 and 1964 and are described as dormitories and residences on a 1946 map of public buildings. An archaeological systematic shovel test pit (STP) survey of the North (Option 1) and South (Option 2) mining site options was conducted in 2017 (Kreisa et al. 2018). Most STPs evidenced varying amounts and types of fill deposits consistent with the man-made nature of the area. Two brick piers and an unidentified intact concrete feature, possibly associated with the temporary World War II-era structures, were identified within the north mining site option and one unidentified concrete feature, possibly a building footing or utility ductwork, was identified within the south mining site option. While 125 artifacts were recovered, dating of the artifacts suggest that the items are from the fill deposits, recent park activities, and the temporary World War II structures. These remains are recommended not eligible for listing in the National Register. NPS and DC SHPO archaeologists have agreed with this recommendation.

Additionally, there are no registered archaeological sites along Independence Avenue SW, or Ohio Drive SW and East Basin Drive SW, where high voltage electricity distribution lines would be extended to the tunnel mining site in West Potomac Park. Kreisa et al. 2018 identifies multiple structures directly south of Independence Avenue SW between 14th Street SW and Maine Avenue SW as early as 1887; however, installation of the electricity distribution lines would be confined to the roadway except in the immediate vicinity of the site.

Prior to filling in the late nineteenth century, the West Potomac Park area was likely a floodplain landform which could have been suitable for human occupation during the late Pleistocene and early Holocene epochs between about 20,000 and 10,000 years ago. A review of geotechnical cores found that while the presence of a stable landform was likely during this time, subsequent sea level rise that initiated tidal conditions and broadened the Potomac River estuary caused a lateral movement of the river channel and destroyed the pre-Holocene landform (Wagner 2018).

3.2.1.2 Tunnel Mining Site Option 2 – West Potomac Park (South)

The approximately six-acre site is also located within the former polo fields, current softball fields, of West Potomac Park, southeast of West Basin Drive SW and south of the Franklin Delano Roosevelt Memorial. This area is additionally addressed in Component 3 – Emergency Overflow Structure Option 2 – West Potomac Park (South), described in *Section 3.2.2.2.* The construction area is almost entirely flat, open lawn with a line of mature landscape trees along the southwest boundary of the site that line Ohio Drive SW. Approximately nine elm trees line the north side of Ohio Drive SW; the remainder of the site is completely open lawn. There are no cherry trees within this site.

The construction area includes three former polo fields, now softball fields, adjacent to Ohio Drive SW, defined by the dirt in-fields and chain-link backstops, seen in **Figure 3-3**. The construction area does not include Ohio Drive SW and the curb, light posts, signage, or other features directly adjacent to the road. However, it is anticipated that ingress/egress to the construction area would be provided from Ohio Drive SW. The construction area ends before the slope up to the northeast, which defines the southwest edge of the Franklin Delano Roosevelt Memorial, and essentially visually and physically separates the softball fields from the memorial and the Tidal Basin beyond, seen in **Figure 3-4**. A high-voltage electricity distribution line would be installed within the right-of-way of Ohio Drive SW and East Basin Drive SW to deliver power to the TBM, as described in *Section 3.2.1.1*.

Figure 3-3: One of the softball fields and backstops, looking southeast

Figure 3-4: Rear of the Franklin Delano Roosevelt Memorial, looking north

The open lawn is a character-defining feature of the historic districts, while the chain-link backstops and dirt in-fields are not character-defining features. The American elm trees located along Ohio Drive SW are also character-defining features as they were planted to frame Ohio Drive SW and provide shade to the adjacent, more active recreational areas. A few non-character-defining features are located within the area, including, but not limited to, manholes and grating.

Key character-defining viewsheds in this section of West Potomac Park include views north to the Washington Monument, views west and south to the Potomac River and Memorial Bridge, and southeast, to the open expanse of the rest of the softball fields in this location. Due to the landscape, other structures, and large trees, no other monuments are visible from the site, including the Lincoln Memorial, Jefferson Memorial, Martin Luther King, Jr. Memorial, or the Franklin Delano Roosevelt Memorial.

This portion of West Potomac Park continues to convey its significance. The area retains its character-defining features and there are no non-contributing features that detract from the area's integrity.

Archaeological Resources

Refer to *Section 3.2.1.1* for archaeological resources within the area of the West Potomac Park (South) mining site option.

3.2.2 COMPONENT 3 – EMERGENCY OVERFLOW STRUCTURE

There are three potential emergency overflow structure sites being considered for the project. The first and second options are located along the Potomac River within the National Mall and East and West Potomac Parks Historic Districts. The third option, also along the Potomac River, is within the Rock Creek and Potomac Parkway Historic District at the mouth of Rock Creek. All three emergency overflow structure options are adjacent to other component options presented in this report.

3.2.2.1 Emergency Overflow Structure Option 1 – West Potomac Park (North)

The first option is located adjacent to and southwest of the Component 2 – Tunnel Mining Site Option 1 – West Potomac Park (North), described in *Section 3.2.1.1*. This option, should it be constructed, would be combined with Component 2 – Tunnel Mining Site Option 1 – West Potomac Park (North) to create an approximately 11-acre site. All the descriptions of character-defining features outlined in *Section 3.2.1.1* would then also apply to this option and this section only describes the additional portion of the site to the southwest.

The portion of the site that would be associated with emergency overflow structure construction begins just south of the John Ericsson Memorial at the start of Ohio Drive SW, stretches from the east side of Ohio Drive SW to the Potomac River to the west, and ends well before West Basin Drive SW. The construction area is built up along Ohio Drive SW and gently slopes down to the southwest where it terminates at the short rough-cut, fieldstone seawall at the Potomac River, seen in **Figure 3-5**. The area would extend into the Potomac River for temporary access to the waterfront, to construct the structure headwall and to place riprap for outfall stabilization. The construction area contains the Rock Creek Park Trail that extends all the way around Hains Point in East Potomac Park. The trail, Ohio Drive SW, and the waterfront contain numerous mature trees, including American elms, willow trees, and approximately 20 flowering cherry trees. Several red maple trees were recently planted within the site as well.

To move traffic to and from Independence Avenue SW and Ohio Drive SW, the temporary intersection and road will be located on the east end of the construction staging area. The northern portion of the site includes the public right-of-way of Independence Avenue SW, including the central median and allies of American elm trees.

The Rock Creek Park Trail, shown in **Figure 3-6**, is a character-defining feature of the historic districts, as the intent of the path is to provide free and open public recreational facilities for District residents and visitors to the National Mall. The seawall that lines the southwest edge of the West Potomac Park is a rough-cut, fieldstone stone seawall, dating to the original reclamation project in the early 20th century and is a character-defining feature. Ohio Drive SW itself is a character-defining feature of the historic district as it provides public access to all parts of the historic district. The trees and vegetation that define the waterfront and line both sides of Ohio Drive SW are also considered character-defining features. Other character-defining features include the sidewalks along Ohio Drive SW, park benches, and light posts that are located within the construction area.

Key character-defining viewsheds in this section of West Potomac Park include views north to the Memorial Bridge, views north, west, and south to the Potomac River and the Virginia shoreline beyond, and southeast, along the shoreline of the Potomac River. Due to the landscape and large trees, no other monuments are visible from the site, including the John Ericsson Memorial, Lincoln Memorial, Washington Monument, Jefferson Memorial, Martin Luther King, Jr. Memorial, or the Franklin Delano Roosevelt Memorial.

This portion of West Potomac Park continues to convey its significance. The area retains its character-defining features and there are very few non-contributing features that detract from the area's integrity, such as trash cans, grating, manholes, parking machines, and parking and road signage.

Figure 3-5: Northwest corner of proposed site, looking southeast

Figure 3-6: Southeast corner of proposed site, looking northwest

Archaeological Resources

Refer to *Section 3.2.1.1* for terrestrial archaeological resources within the area of the West Potomac Park (North) emergency overflow structure option. An assessment of the area within the Potomac River for submerged archaeological resources indicated that there was no potential for the remains of wharves, piers, or other similar structures or shipwrecks at the location of either option (Kreisa et al. 2018). Stable bathymetric depths suggest that the Potomac River bottom was relatively stable and was less likely to have been significantly disturbed by dredging. This area was not within the main channel of the Potomac River and as such retains a potential to have been a floodplain landform suitable for human occupation during the late Pleistocene and early Holocene epochs between about 20,000 and 10,000 years ago. However, a review of geotechnical cores found that while the presence of a stable landform was likely during this time, subsequent sea level rise that initiated tidal conditions and broadened the Potomac River estuary caused a lateral movement of the river channel and destroyed the pre-Holocene landform (Wagner 2018).

3.2.2.2 Emergency Overflow Structure Option 2 – West Potomac Park (South)

The second option is located directly southwest of the Component 2 – Tunnel Mining Site Option 2 – West Potomac Park (South), described in *Section 3.2.1.2*. This option, should it be constructed, would be combined with Component 2 – Tunnel Mining Site Option 2 – West Potomac Park (South) to create an approximately 11-acre site. All the descriptions of character-defining features outlined in *Section 3.2.1.2* would then also apply to this option and this section only describes the additional portion of the site to the southwest.

The portion of the site that would be associated with emergency overflow construction extends from the terminus of Component 2 – Tunnel Mining Site Option 2– West Potomac Park (South) and extends to the waterfront into the Potomac River. The additional land gently slopes down to the water and includes about a dozen American elms, one weeping willow, and numerous maple trees, as well as six flowering cherry trees. The construction area would extend to the southwest into the Potomac River during the construction of the structure headwall and to place riprap for outfall stabilization. The construction area contains the Rock Creek Park Trail that extends all the way around Hains Point in East Potomac Park.

The Rock Creek Park Trail is a character-defining feature of the historic districts as part of their intent to provide free and open public recreational facilities for District residents and visitors to the National Mall. The rough-cut, fieldstone

seawall that lines the southwest edge of the West Potomac Park is a character-defining feature; it is one of the original features of the park on land that was part of the original fill construction of East and West Potomac Parks. Ohio Drive SW itself is a character-defining feature as it provides public access to all parts of the historic districts. The trees and vegetation that define the waterfront and line both sides of Ohio Drive SW are also considered character-defining. Other character-defining features include park benches and light posts that are located within the construction area. Key character-defining viewsheds in this section of West Potomac Park include views north to the Memorial Bridge, and views north, west, and south to the Potomac River and the Virginia shoreline beyond. Due to the landscape, topography, and large trees, no monuments are visible from the site, including the Lincoln Memorial, Jefferson Memorial, Martin Luther King, Jr. Memorial, or the Franklin Delano Roosevelt Memorial.

This portion of West Potomac Park continues to convey its significance. The area retains its character-defining features. There are a few non-contributing features, such as trash cans, water fountains, fire hydrants, manholes, grating, and parking and road signage, but they do not detract from the area's integrity.

Archaeological Resources

Refer to *Section 3.2.1.1* for terrestrial archaeological resources and *Section 3.2.2.1* for submerged archaeological resources within the area of the West Potomac Park (South) emergency overflow structure option.

3.2.2.3 Emergency Overflow Structure Option 3 – CSO 022

The third option is located west of the Watergate Complex, just south of the intersection of Virginia Avenue NW and Rock Creek and Potomac Parkway NW, and southeast of where Rock Creek drains into the Potomac River. The eastern edge of the construction area is defined by Rock Creek and Potomac Parkway NW and extends out into the Potomac River. The construction area is relatively flat, with a gentle slope to the southwest from Rock Creek and Potomac Parkway NW towards the Potomac River. Unlike other areas of the District's waterfront, this section of seawall, which includes the existing CSO 022 outfall pipe, is a mixture of historic and contemporary materials; a large section of the seawall within the construction area has a historic fieldstone seawall underneath approximately three feet of poured concrete, contemporary seawall, seen in **Figure 3-7**. The area contains three mature willow oak trees and other vegetation, including, but not limited to, red oak, locust, and Chinese elm. The vegetation gets thicker towards the northern portion of the site, around the mouth of Rock Creek, reflecting a more natural landscape. The Rock Creek Park Trail runs adjacent to Rock Creek and Potomac Parkway NW and splits into two paths briefly within the construction area, seen in **Figure 3-8**.

Figure 3-7: View of historic seawall topped by contemporary seawall

Figure 3-8: View of Rock Creek Park Trail, looking north

The Rock Creek Park Trail is a character-defining feature of the historic district. The fieldstone portion of the seawall that lines the southwest edge of the staging area is a character-defining; however, the contemporary, built-up concrete portion is not. The trees and vegetation that define the waterfront, especially the thicker, more natural vegetation along the mouth of Rock Creek, are also considered character-defining features even if they were planted outside of the period of significance.

Key character-defining viewsheds in this section of Rock Creek and Potomac Parkway include views north to Rock Creek, views east and south to the Watergate Complex, views south to the John F. Kennedy Center for the Performing Arts (Kennedy Center), shown in **Figure 3-9**, and views west and south to the Potomac River, Theodore Roosevelt Island, and the Georgetown Waterfront, shown in **Figure 3-10**. Due to the landscape, topography, and other trees, no other monuments are visible from the site, including the Lincoln Memorial or Memorial Bridge, which is obscured by the Theodore Roosevelt Bridge.

As a component of the District's waterfront and as the entrance to Rock Creek the area continues to retain its character-defining features. While the area includes non-contributing resources such as the modern seawall, there are no non-contributing features that detract from the area's integrity, such as trashcans and parking and road signage. Additionally, a CSO warning sign and lights are situated adjacent CSO 022 to warn boaters, rowers, kayakers, etc., when sewage overflows into the Potomac River. This feature is visible in **Figure 3-10**.

Figure 3-9: Southern end of proposed site, looking south

Figure 3-10: Center of proposed site, looking west towards Roosevelt Island

Archaeological Resources

There are no registered archaeological sites within the area of the emergency overflow structure option at CSO 022. However, historical map research suggests that the area contained predominantly industrial structures throughout the period of review. The 1861 Boschke map depicts a series of bulkheads along the Potomac River but no structures. The assessment also indicated that wharves, docks, and bulkheads were at this location (depicted on maps dating to 1795, 1849, and 1884 [Kreisa et al. 2018]). An analysis of shoreline change suggests that the shoreline was extended westward into the Potomac River in the late 19th and early 20th centuries. This suggests that remains of these structures could be present beneath fill deposits. To the east a railroad line and several buildings, denoted as the Washington Gas Light Company, were present by 1887. These structures remained, little changed through the early twentieth century. By 1960, the structures and railroad line had been removed.

A geoarchaeological survey consisting of the extraction of three continuous cores was conducted within the emergency overflow structure option at CSO 022 (Kreisa et al. 2018). All three borings were placed adjacent to locations that historical maps depicted late 19th - or early 20th-century structures associated with the Washington Gas Light Company. Two borings encountered deposits of building materials while the third identified a potentially intact buried land

surface dating to the late Pleistocene or early Holocene epochs at slightly over 15 feet (4.6 m) below surface. A review of geotechnical cores found that while the presence of a stable landform was likely during this time, subsequent sea level rise that initiated tidal conditions and broadened the Potomac River estuary caused a lateral movement of the river channel and destroyed the pre-Holocene landform (Wagner 2018). Based on Wagner (2018), the potentially intact buried land surface identified in one of the initial three borings was a fill deposit.

An assessment of the area within the Potomac River for submerged archaeological resources indicated that there was a low potential for the remains of wharves, piers, or other similar structures or shipwrecks at this location (Kreisa et al. 2018). The location of wharves, piers, and bulkheads depicted on nineteenth century maps are now situated within the terrestrial component of this construction area due to expansion of this landform with dredge materials. The uppermost 10 to 15 feet of the river bottom was subjected to dredging within the submerged portion of the construction area. As such, there appears to be little potential for submerged archaeological resources.

3.2.3 COMPONENT 4 – VENTILATION CONTROL FACILITY AND UPIRS DIVERSION STRUCTURE

The proposed location of the ventilation control facility and UPIRS diversion structure is in the Rock Creek and Potomac Parkway Historic District. The approximately two-acre construction area is bound by Whitehurst Freeway NW to the north, 27th Street NW to the east, Virginia Avenue NW to the south, and Rock Creek and Potomac Parkway NW directly to the west. The construction area is relatively flat, with a few trees located in the northern portion and vegetation that gets thicker moving to the southern end of the site, as seen in **Figure 3-11**. The area has 11 mature trees: six maple trees to the north, four holly trees to the south, and one elm tree, also to the south. None of the vegetation or trees within this portion of the resource are considered to be character-defining. A large, concrete Washington Metropolitan Area Transit Authority (WMATA) facility is located between the construction area and the intersection of Virginia Avenue NW and I Street NW, as seen in **Figure 3-12**.

Figure 3-11: Southeast corner of proposed site, looking north

Figure 3-12: Southwest corner of proposed site, looking southeast towards the WMATA structure

There are very few character-defining features of Rock Creek and Potomac Parkway Historic District within this construction area. The area was turned into a secondary space after being cut off from the main expanse of Rock Creek and Potomac Parkway by the construction of the Whitehurst Freeway NW. As such, this portion of Rock Creek and Potomac Parkway, while it retains parts of its identity as a historic property, has been altered. The site is in its original location; however, its design as a natural landscape and setting, association, and feeling were drastically changed after the construction of the Whitehurst Freeway NW was completed in 1949. Also, the workmanship and materials were altered with the introduction of the contemporary concrete structure of the Whitehurst Freeway NW and the concrete WMATA structure that, while it is outside the construction area, directly effects the character of this portion of Rock Creek and Potomac Parkway Historic District.

There are no key viewsheds from this portion of Rock Creek and Potomac Parkway. The view north to the rest of the historic district and West Heating Plant in Georgetown in obscured by the Whitehurst Freeway NW; the view east to Foggy Bottom Historic District is obscured by I-66; the view south to the Watergate is blocked by the WMATA structure; and the view west to Rock Creek is blocked by contemporary planting around the Thompson Boat Center parking lot.

The area continues to be part of the Rock Creek and Potomac Parkway Historic District but lacks the integrity and significance that is found and conveyed by other areas of the historic district that remain in an unaltered state.

Archaeological Resources

One archaeological site, 51NW120, the Lime Kiln site, has been registered in the area of the proposed ventilation control facility and UPIRS diversion structure (Glumac et al. 1993). The site consists of the remains of the kiln and was found to continue to 13 feet below surface and is currently unevaluated for listing in the National Register. Historic maps dating to the 19th century also indicate that the remains of residences and commercial buildings could be present in other portions of the construction area (Kreisa et al. 2018).

3.2.4 COMPONENT 5 – CSO 020 CONTROL

There are two potential sites being considered for CSO 020 Control and both fall within the National Mall and East and West Potomac Parks Historic Districts. The first option is located directly south of the I-66 off ramp to Constitution Avenue NW west of 23rd Street NW while the second is located at the Lincoln Memorial Sand Volleyball Courts east of the Potomac River and Rock Creek and Potomac Parkway NW.

3.2.4.1 CSO 020 Control Option 1 – 23rd St NW/Constitution Ave NW

The approximately two-acre site is in the northwest corner of West Potomac Park, directly south of the I-66 off ramp to Constitution Avenue NW east of the I-66 on ramp from Rock Creek and Potomac Parkway NW. To the south and east are further open spaces that terminate at the on ramp to Ohio Drive NW to the south and 23rd Street NW to the east. The construction area is almost entirely flat, open lawn with a line of mature elm trees located along the northern edge of the construction area, seen in **Figure 3-13**, that line the I-66 on ramp from Constitution Avenue NW. A sidewalk also lines the northern edge of the construction area and cuts across the northwest corner. It continues from Constitution Avenue NW to the I-66 on ramp from Rock Creek and Potomac Parkway NW and connects the National Mall with Rock Creek and Potomac Parkway to the west of the construction area but is prevented from connecting to the Rock Creek Trail due to lack of marked pedestrian crosswalks. The western edge of the proposed site slopes down to the I-66 on ramp from Rock Creek and Potomac Parkway NW; the area has a grove of approximately 10 flowering cherry trees, visible on the right-hand side of **Figure 3-14.**

Figure 3-13: Southern edge of proposed site, looking north

Figure 3-14: Northwest corner of proposed site, looking south

The open lawn that defines the proposed construction area is a character-defining feature of the historic districts as the land was created from fill with the original intention of providing free and open public recreational space for District residents and visitors to the National Mall. The mature trees located along the northern and western edges of the construction area are also character-defining features of the National Mall and East and West Potomac Parks Historic Districts. Another critical character-defining feature is the grove of cherry trees to the west. The path that cuts through the construction area is not considered a character-defining feature of the resource, as it is the result of paving desire-lines that had been developed across the lawn over time and does not appear to be historic. Other non-contributing features can be found throughout the construction area, including, but not limited, to non-historic light posts and road signs. It is important to note that the site is not included in the official landscape boundary of the Lincoln Memorial, which is limited to the trees lining 23rd Street NW, east of the site, and the vegetation along Lincoln Memorial Circle, to the south of the site.

Key character-defining viewsheds in this section of West Potomac Park include views south the Lincoln Memorial, and southeast to the Washington Monument. Views to the east, towards the Vietnam Veterans Memorial are obscured by the trees outside the project area, along 23rd Street NW. Views to the north and east, towards the Observatory Hill Historic District and Constitution Avenue NW are blocked by the built-up slope north of the site that is the on-ramp from Constitution Avenue NW to I-66, as shown in **Figure 3-15**.

This portion of West Potomac Park continues to convey its identity as a historic property, though it is a secondary space in the park as it does not currently house any recreational fields, seating, memorials, or monuments. The area retains its character-defining features and the non-contributing features do not detract from the area's integrity.

Figure 3-15: View of proposed site from the northwest corner, looking east

Archaeological Resources

There are no registered archaeological sites within the area of either CSO 020 Control option. Both areas are in late nineteenth-century "made-land" that have, for the entire existence, been uninhabited (Kreisa et al. 2018). Historically, this area was not situated within the main channel of the Potomac River. Therefore, these options retain a potential to have been floodplain landforms during the late Pleistocene and early Holocene epochs. As such, the construction areas could have been suitable for human occupation between about 20,000 years and 10,000 years ago when the areas may have been stable, terrestrial landforms during the late Pleistocene or early Holocene epochs. However, a review of geotechnical cores found that while the presence of a stable landform was likely during this time, subsequent sea level rise that initiated tidal conditions and broadened the Potomac River estuary caused a lateral movement of the river channel and destroyed the pre-Holocene landform (Wagner 2018).

3.2.4.2 CSO 020 Control Option 2 – Lincoln Memorial Volleyball Courts

The approximately two-acre site is in the northwest corner of West Potomac Park. The site is bound by Rock Creek and Potomac Parkway NW on all sides. The site is directly south of the split that takes the parkway either east to Ohio Drive NW or south, to Lincoln Memorial Circle. A majority of the construction area has mature elm trees, linden trees, boxwoods, and approximately 10 flowering cherry trees. The northwest edge of the construction area includes portions of four of the 11 volleyball courts that are in the area, seen in **Figure 3-16**. The construction area is bisected by the

Rock Creek Park Trail, as well as a gravel NPS maintenance road that leads from a NPS storage facility under Rock Creek and Potomac Parkway NW to Ohio Drive SW, the entrance is visible on the left side of **Figure 3-17**.

Figure 3-16: Northeast corner of proposed site, looking west

Figure 3-17: Northwest corner of the proposed site, looking southeast at the NPS Maintenance road

The trees, vegetation, and volleyball courts, within the construction area are all character-defining features of the historic districts as the land was created with the intention of providing free and open public recreational space for District residents and visitors to the National Mall, as is the Rock Creek Park Trail. The maintenance road is a non-contributing feature, along with non-historic light posts, manholes, and road signs.

Key character-defining viewsheds in this section of West Potomac Park include views north to the Kennedy Center and views east to the Washington Monument. Only at the eastern-most portion of the proposed site is the Lincoln Memorial visible to the southeast. Views to the south and west, towards the Potomac River, are blocked by the steep slope up to Rock Creek and Potomac Parkway NW.

This portion of West Potomac Park continues to convey its identity as a historic property. The area retains its character-defining features, including the recreational volleyball courts, and the non-contributing NPS maintenance road that runs through the site, as well as the non-historic light posts and road signs, do not detract from the historic district's integrity or significance.

Archaeological Resources

Refer to *Section 3.2.4.1* for archaeological resources within the area of this CSO 020 Control option.

3.2.5 COMPONENT 6 – CSO 021 CONTROL

The CSO 021 Control construction area is located directly south of the Kennedy Center. The Kennedy Center was determined eligible for listing in the DC Inventory and National Register in 2012 and the southern portion of the complex is currently under construction with a large expansion project. The CSO 021 diversion facility is currently under construction in conjunction with the Kennedy Center expansion and has been located entirely within the current construction site of the Kennedy Center expansion project. Under the Potomac River Tunnel project, no new at- or above-grade structures would be constructed. An adit would be constructed deep underground to connect the diversion to the tunnel and the facility would be placed into operation by using existing access points; no character-defining features of the historic property would be impacted by the proposed construction.

Archaeological Resources

There are no registered archaeological sites within the CSO 021 Control area. Depth of anticipated construction indicates that there is no potential to impact archaeological resources at this location.

3.2.6 COMPONENT 7 – CSO 022 CONTROL

There are two potential locations for the CSO 022 Control located in the Rock Creek and Potomac Parkway Historic District. The first option is located along the Potomac River waterfront, in the same location as described in *Section 3.2.2.3* Emergency Overflow Structure Option 3 – CSO 022 Control. The second location is at Virginia Avenue NW and 27th Street NW, adjacent to the construction area described in *Section 3.2.3* Component 4 – Ventilation Control Facility and UPIRS Diversion Structure.

3.2.6.1 CSO 022 Control Option 1 – Waterfront/Existing Outfall

Refer *to Section 3.2.2.3* for a description of the existing conditions within the area of the CSO 022 Control at the Waterfront/Existing Outfall.

Archaeological Resources

Refer to *Section 3.2.2.3* for archaeological resources within the area of the CSO 022 Control at the Waterfront/Existing Outfall.

3.2.6.2 CSO 022 Control Option 2 – Virginia Ave NW/27th St NW

The construction area is located within the Rock Creek and Potomac Parkway Historic District, bound by Whitehurst Freeway NW to the north, Potomac Freeway to the east, the Watergate Complex to the south, and Rock Creek and Potomac Parkway NW to the west. The three rowhouses along the on-ramp to the Potomac Freeway are not included within this project area; however, the public right-of-way of the Potomac Freeway on-ramp is. The southern portion of the construction area is limited to the public right-of-way of Virginia Avenue NW and 27th Street NW, seen in **Figure 3-18**, while the northern portion of the area, is located on the eastern edge of Rock Creek and Potomac Parkway, adjacent to the area described above in *Section 3.2.3* Component 4 – Ventilation Control Facility and UPIRS Diversion Structure. This portion of Rock Creek and Potomac Parkway, along 27th Street NW, shown in **Figure 3-19**, has approximately 11 mature trees, including four holly trees and one elm tree to the south, and six maple trees to the north. A large, concrete WMATA facility just west of the construction area, at the corner of Virginia Avenue NW and 27th Street NW.

Figure 3-18: Southern end of proposed site, looking south

Figure 3-19: Northern end of proposed site, looking north

There are very few character-defining features of the Rock Creek and Potomac Parkway Historic District within this construction area. The area became a secondary space after being cut off from the main expanse of Rock Creek Park by the Whitehurst Freeway NW. As such, aspects of integrity such as the natural setting, association, and feel, as well as the original landscape of this portion of Rock Creek and Potomac Parkway have been compromised by the construction of the Whitehurst Freeway NW. Also, the workmanship and materials were altered with the introduction of the contemporary concrete structure of the Whitehurst Freeway NW and the concrete WMATA structure. While these modern structures are outside the construction area, they directly affect the character of this portion of Rock Creek and Potomac Parkway Historic District.

Key viewsheds in this area include views south to the Watergate Complex and views to the northwest and southeast, up and down Virginia Avenue NW, as part of the Plan of the City of Washington. The views north along 23rd Street NW have been obscured by I-66 and the Whitehurst Freeway on-ramp. Views to the east are obscured by contemporary buildings and I-66 and views to the east, towards the Potomac River and Georgetown, are blocked by the WMATA structure and large trees.

The area continues to be part of the Rock Creek and Potomac Parkway Historic District but lacks integrity due to modern intrusions.

Archaeological Resources

There are no known archaeological sites within the area of this CSO 022 Control option. Kreisa et al. (2018) indicated the presence of numerous structures from the mid-nineteenth century through the early twentieth century west of 27th Street NW. However, the structures were subsequently demolished with the construction and expansion of the Montgomery-Briggs School, itself razed during the 1960s. Historically, the earlier structures included a mix of residential and commercial/industrial uses. A similar range of structures were located east of 27th Street. To the west of 27th Street NW, the construction area lies between the 12.5-foot diameter Rock Creek diversion sewer, the 8- to 16-foot diameter Potomac River Interceptor, and a WMATA facility. The subsurface impacts associated with the construction of these facilities, as well as the construction and demolition of the Montgomery-Briggs School, suggests that the area retains little potential for the presence of intact archaeological resources (Kreisa et al. 2018). In contrast, such utilities and extensive demolition disturbance does not appear to have occurred west of 27th Street NW. That area retains a potential for archaeological resources.

3.2.7 COMPONENT 8 – CSO 024 CONTROL AND UPI DIVERSION STRUCTURE

The proposed CSO 024 Control and UPI diversion structure site is located at the terminus of the Whitehurst Freeway NW and K Street NW. The site stretches from the intersection of 30th Street NW and K Street NW, just prior to 29th Street NW, where K Street NW and the Whitehurst Freeway NW converge. The site does not include 29th Street NW or the convergence of the three roads, shown in **Figure 3-20**. The site is contained within the public right-of -way of the road and an empty lot owned by the District Department of Transportation just north of K Street NW, shown in **Figure 3-21**. The area is entirely flat with only one maple tree, located at the northeast corner of 30th Street NW and K Street NW. While the construction area is located within the historic district, no historic properties would be affected by the proposed construction of the CSO 024 Control and UPI diversion structure.

This part of Georgetown has experienced significant change and the once bustling waterfront with active wharves and industrial warehouses along K Street NW has been altered with the demolition of the historic wharfs and waterfront structures. The construction of Whitehurst Freeway NW has introduced a modern, steel and concrete structure and significantly changed the feeling and association of this once industrial part of Georgetown.

Key viewsheds of the site that are character-defining are limited to views north up 30th Street NW to Georgetown, south down 30th Street NW to the Potomac River, and views east and west along K Street NW. Views up 29th Street NW to West Heating Plant and Georgetown do not fall within the site and views east to Rock Creek and Potomac Parkway are obscured by the foundations of the Whitehurst Freeway.

Figure 3-20: Eastern edge of proposed site, looking east; this portion of the roadways are not within the site

Figure 3-21: Northwest corner of proposed site, looking east

The area continues to be part of the Georgetown National Historic Landmark District but lacks the integrity and historic associations that once characterized this part of Georgetown. The construction area has utility cabinets, light posts, manholes, park and street signage, and contemporary fencing throughout.

Archaeological Resources

There are no registered archaeological sites within the CSO 024 Control and UPI diversion structure site. While multiple structures were depicted adjacent to the area as early as 1861, existing utilities present beneath K Street NW (four-foot diameter UPI combined sewer) and 30th Street NW (2.5-foot diameter combined sewer) suggest a low potential for intact archaeological resources. Additionally, the 9.5-foot diameter combined sewer, to which the CSO 024 diversion chamber would connect, is present along 30th Street NW from the Potomac River to K Street NW before turning east down K Street NW. The installation of the diversion facility within K Street NW, given the multiple utilities present, has a low potential to impact intact archaeological resources (Kreisa et al. 2018). The construction area extends south of K Street NW. Residential and commercial structures are depicted at that location as early as the mid-nineteenth century.

3.2.8 COMPONENT 9 – CSO 027 CONTROL

There are two possible construction areas for the CSO 027 Control. The first option includes portions of Georgetown Waterfront Park and K Street NW spanning Potomac Street NW. The second option is located entirely within the Georgetown Waterfront Park, between 33rd Street NW and Potomac Street NW. An emergency surge relief pipe could be included as part of either option.

3.2.8.1 CSO 027 Control Option 1 – K St NW/Georgetown Waterfront Park

The approximately two-acre site falls within the public right-of-way of K Street NW, at the intersection of K Street NW and Potomac Street NW, shown in **Figure 3-22**. The other half of the construction site falls within the Georgetown Waterfront Park. The area is a flat, public roadway to the north and a recently designed landscape to the south, with vegetation, pathways, and open spaces shown in **Figure 3-23**. Georgetown Waterfront Park was constructed between 2006 and 2008 as a contemporary recreational landscape that greatly improves the experience of the Georgetown Waterfront.

While the construction area is located within the Georgetown National Historic Landmark District, the setting has been altered by the construction of the contemporary park, modern-office buildings, and the Whitehurst Freeway NW. The new park creates a new association and feeling separate from the historic wharves and industrial uses that once characterized this area. The area continues to be located within the Georgetown National Historic Landmark District but lacks integrity due to the modern construction. However, there are key character-defining views of the Georgetown Waterfront to be considered, including the view northwest to Francis Scott Key Bridge, views west and south to the Potomac River and George Washington Memorial Parkway, and views south and east to the Potomac River, Theodore Roosevelt Island, Watergate Complex, and Kennedy Center, seen in background of **Figure 3-23**.

Figure 3-22: Northern corner of proposed site, looking north, at intersection of Potomac and Water Streets NW

Figure 3-23: Northwest corner of proposed site, looking southwest

Archaeological Resources

One registered archaeological site (51NW075) covers both CSO 027 Control options. This site was investigated as part of a testing program for the Georgetown Waterfront Park, in part to determine the potential impact of park development on archaeological resources (Artemel et al. 1985). Beneath 1.5–5 feet of fill, archaeologists uncovered numerous early nineteenth-century building foundations and brick floors as well as late eighteenth-century cobblestone pavements. A pre-contact Native American component was also encountered, yielding features such as hearths and artifacts such as stone tools, debitage, and pottery.

Minimally, five structures were depicted within or adjacent to the construction areas on the 1802–1803 Latrobe map; however, a number of these are potentially entirely or partially under K Street NW. Structure numbers increased throughout the nineteenth century. Additionally, wharves and docks depicted on historic maps may now be covered by fill.

Finally, the near shore zone of the Potomac River could be impacted if the emergency surge relief pipe is constructed at CSO 027. Historical map review indicates that docks or wharves were present along the shoreline in this area during the nineteenth and twentieth centuries. The remains of these docks and wharves may extend into the near shore zone of the Potomac River (Kreisa et al. 2018).

3.2.8.2 CSO 027 Control Options 2 – Georgetown Waterfront Park

The approximately two-acre site is bound by Water Street NW to the north and the Potomac River to the south. The east and west boundaries are approximately Potomac Street NW and 33rd Street NW, if those streets continued through Georgetown Waterfront Park to the Potomac River. The entire site falls within the Georgetown Waterfront Park. The area is a flat, contemporary landscape with designed vegetation, pathways, and open spaces. The park was constructed between 2006 and 2008 to improve the Georgetown Waterfront, as shown in **Figures 3-24** and **3-25**.

While the construction area is located within the historic district, the proposed site of the CSO 027 Control option is within an area completely defined by modern construction. The area continues to be part of the Georgetown National Historic Landmark District but lacks integrity because of modern intrusions. However, there are key character-defining views of the Georgetown Waterfront to be considered, including the view northwest to Francis Scott Key Bridge, views west and south to the Potomac River and George Washington Memorial Parkway, and views south and east to the Potomac River, Theodore Roosevelt Island, Watergate Complex, and Kennedy Center.

Archaeological Resources

Refer to *Section 3.2.8.1* for archaeological resources within the area of this CSO 027 Control option.

Figure 3-24: Northeast corner of proposed site, looking west

Figure 3-25: Northern edge of proposed site, looking northwest

3.2.9 COMPONENT 10 – CSO 028 CONTROL

The proposed CSO 028 Control is located within three separate historic properties: Georgetown National Historic Landmark District, C&O Canal NHP, and the Potomac Gorge. The site is located directly west of the Potomac (Alexandria) Aqueduct Bridge Abutment and Pier, south of the C&O Canal towpath, and east of the Washington Canoe Club. The site is mostly flat with a steep slope in the northern portion that climbs up towards the C&O Canal towpath, shown in **Figure 3-26**. There is dense, natural vegetation and trees in the southwest corner that are part of the natural Potomac River landscape and vines along the steep slope of the towpath for stabilization, but majority of the site is empty of vegetation. The Capital Crescent Trail, a paved path shown in **Figure 3-27**, bisects the site from east to west. The steep slope of the canal embankment is a character-defining feature of the C&O Canal NHP, as is the Capital Crescent Trail, which is also a character-defining feature of the Georgetown National Historic Landmark District. The natural vegetation and trees along the Potomac River are character-defining features of all three resources, especially the Potomac Gorge.

Key character-defining viewsheds from the site include the view west, down the Capital Crescent Trail, view east toward the Potomac (Alexandria) Aqueduct Bridge Abutment and Pier, and views south to the Potomac River, Francis Scott Key Bridge and George Washington Memorial Parkway. The view north to the canal is obscured by the steep slope of the canal embankment; however, the views to Georgetown beyond are character-defining.

This site remains an integral parcel within all three historic properties: Georgetown Historic District, C&O Canal NHP, and the Potomac Gorge. The area retains its character-defining features and though there are numerous contemporary, non-contributing features, they do not detract from the area's integrity, including a high density of existing utility infrastructure and numerous existing manholes and access points scattered throughout the construction area.

Figure 3-26: Southeast corner of proposed site, looking north towards C&O Canal

Figure 3-27: Western edge of proposed site, looking east at Aqueduct Abutment and Pier

Archaeological Resources

There are no registered archaeological sites within the CSO 028 Control area. Historical map review indicates that a series of commercial and recreational structures were present in the area between the Francis Scott Key Bridge and the Washington Canoe Club in the second half of the nineteenth century into the twentieth century (Kreisa et al. 2018). An early twentieth century dock extended into the Potomac River at the location of the emergency surge relief pipe that may be constructed at CSO 028.

Geoarchaeological core extraction encountered deposits consistent with the remains of one or more structures. Three cores encountered soft paste (handmade, likely fired in a clamp kiln) brick at approximately three feet below surface. The other three did not encounter any structural debris. However, a potential Native American flake associated with the manufacture of stone tools was recovered at 13 feet below surface (Kreisa et al. 2018).

3.2.10 COMPONENT 11 – CSO 029 CONTROL

There are two possible construction areas for the CSO 029 Control. Both options are generally located between Canal Road NW and the southwest entrance to Georgetown University.

3.2.10.1 CSO 029 Control Option 1 – Canal Road NW / Georgetown University Southwest Entrance

The proposed CSO 029 Control Option 1 is located on Canal Road NW at the west end of the Georgetown National Historic Landmark District. The site is bound by the southern half of Canal Road NW to the south, and Georgetown University to the north, east, and west. A majority of the site falls within the public right-of-way of Canal Road NW and a private entrance that leads northwest towards the Georgetown University Campus, shown in **Figure 3-28**. The portion of the site that falls within Canal Road NW is relatively flat, but the northern portion of the site that leads toward the Georgetown University campus contains the beginning of a steep slope north.

The construction area is located within the Georgetown Historic District. Canal Road, shown in **Figure 3-29**, continues to contribute to the Georgetown Historic District, though this section was completely reconstructed in the early 21st century when Georgetown University reconfigured the southwest entrance to the campus. There are no contributing features to the historic district located within the construction area. Key character-defining viewsheds from this area include those east and west along Canal Road NW and those to the south, not of the C&O Canal, as it is not visible from the road, but of the Potomac River beyond.

Figure 3-28: Southeast corner of proposed site, looking west

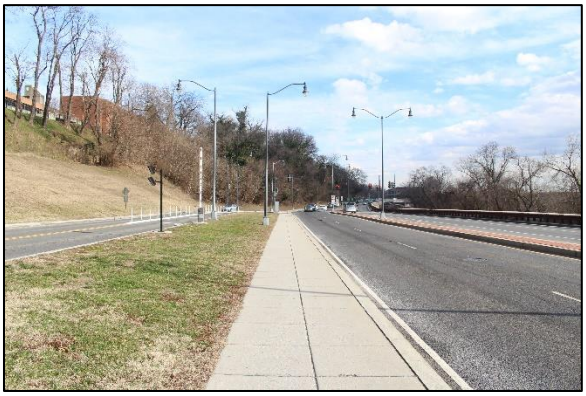

Figure 3-29: Center of proposed site, looking east towards Georgetown

Archaeological Resources

There is one registered archaeological site, 51NW112, within CSO 029 Control Option 1. Site 51NW112 contains both pre-contact Native American and Historic period archaeological resources and has not been evaluated for listing in the National Register. Geoarchaeological core extraction placed to the southwest of 51NW112 also encountered a deposit consistent with the remains of a structure depicted on the 1861 Boschke map (Kreisa et al. 2018). The single core encountered a layer of soft paste (handmade, likely fired in a clamp kiln) brick at 16 feet below surface.

3.2.10.2 CSO 029 Control Option 2 – South of Georgetown University

The proposed CSO 029 Control Option 2 is located at the southern portion of Georgetown University's campus, just north of the exit to Canal Road NW at the west end of the Georgetown National Historic Landmark District. The site is bound by the entrance road to the north and east, a steep cliff down to Canal Road NW to the south, and a wooded portion of land owned by WMATA to the west. A majority of the site falls within the WMATA property, though the land is located on Georgetown University's campus, shown in **Figure 3-30** and **3-31**. The site has a slope up from the access road, with a concrete retaining wall on the east end of the site, with open grass and smaller trees and plantings to the north and west, and a thick stand of trees to the south, leading to the steep slope down to Canal Road NW.

Figure 3-30: East corner of proposed site, looking east

Figure 3-31: West end of proposed site, looking south from across the access road

The construction area is located within the Georgetown National Historic Landmark District. Georgetown University's campus continues to contribute to the historic district, though this section was completely reconstructed in the early 21st century when the school reconfigured the southwest entrance from Canal Road NW. There are no contributing features or viewsheds to the historic district located within the proposed construction area.

Archaeological Resources

There are no registered archaeological sites within the CSO 029 Control Option 2, while the only potential mapped Historic period resource identified is a streetcar line dating to the early twentieth century. The installation of CSO 029 Control Option 2 has a moderate potential to impact both intact pre-contact Native American, based on proximity to the Potomac River, and Historic period, the streetcar line, archaeological resources (Kreisa et al. 2018).

3.2.11 COMPONENT 12 – TUNNEL CONNECTION TO EXISTING SHAFT AT JBAB

The tunnel would connect to the existing shaft at JBAB. The site is bound by the Potomac River to the west, Giesboro Park to the north and east, and base housing to the south. The site is not within or adjacent to any listed or eligible historic properties and there are no character-defining features within the site.

Archaeological Resources

No archaeological sites have been registered where the Potomac River Tunnel would connect to the existing shaft at JBAB. In 2013, Versar, Inc., conducted archaeological site survey investigations (Rohm et al. 2013) prior to construction of the existing ventilation shaft at the site. Testing methods consisted of the excavation of one trench and three test units. The documented stratigraphy revealed several strata of fill over Pleistocene-age subsoils. No archaeological resources were identified.

3.2.12 GREEN INFRASTRUCTURE

Green Infrastructure may potentially be implemented in lieu of tunnel infrastructure within the CSO 027, 028, and 029 sewersheds based on the outcome of the practicability determination to be performed by DC Water. A majority of the Georgetown National Historic Landmark District falls within the three sewersheds.

Character-defining features of the historic district include structures built within the period of significance that stretches from 1751 to 1950, as well as multiple areas of significance, including architecture, commerce, entertainment/recreation, exploration/settlement, industry, transportation, and archaeology. Roughly bound by Reservoir Road NW and Dumbarton Oaks Park to the north, Rock Creek Park to the east, the Potomac River to the south, and Glover-Archbold Parkway to the west, the historic district includes over 4,000 contributing structures and countless other character-defining features. Some of those features include the cobble-stone roadways and streets, paved and bricked alleys, brick, stone, and concrete sidewalks that form a unique patchwork of materials, light posts, mailboxes, call boxes, fences and gates, and trolley rails.

Overall, the Georgetown National Historic Landmark District has a high degree of integrity and significance. The district retains much of its Federal, Greek Revival, Italianate, Queen Anne, Romanesque, and Classical Revival architecture and the neighborhood continues to convey its feeling as a mid- to late- 18th-century town. Other resources within Georgetown are individually listed; a list of those resources within the sewersheds can be found in **Table 2-2**. For conservatism, all resources within the GI sewersheds have been included; however, not all will be affected pending final siting of GI facilities.

Archaeological Resources

Archaeological assessment and survey specific to GI implementation in the CSO 027, 028, and 029 sewersheds has not been conducted. However, archaeological investigations for a variety of unrelated undertakings have been conducted within the boundaries of the three GI areas, although less than 1 percent of the areas have been investigated for the presence of archaeological resources. These investigations have resulted in the identification of a number of pre-contact Native American and Historic period archaeological resources.

Georgetown has a long history, with Native American occupation of the area along the Potomac River between Rock Creek and Foundry Branch for thousands of years prior to the foundation of Georgetown. The numerous listed historic districts further attest to the historical importance of Georgetown since the eighteenth century. It is not surprising, therefore, that numerous pre-contact Native American and Historic period archaeological sites have been identified within or near the three GI areas. Native American sites range from fishing camps along the Potomac River, villages and camps along the river and Rock Creek, and lithic quarries, among others. Historic period sites include domestic and commercial structural remains and associated artifact deposits as well as industrial sites, such as mills, dating from the late eighteenth through the nineteenth centuries. Overall, it is likely that large portions of the three GI areas have a high potential for the presence of similar but currently unidentified archaeological resources where past disturbance has not occurred.

Table 3-1: Summary of results of Phase IA Archeological Assessment and Phase IB Survey with Recommendations

Component Number	Area	Rationale	Recommendations
1	Tunnel Corridor	Constructed 75–100 feet below surface	Create action plan to be implemented in cases of subsidence during construction
2	Tunnel Mining Site Option 1 -West Potomac Park (North)	Made land; no potential for late Pleistocene/early Holocene deposits; few intact deposits associated with temporary structures	No additional investigations
2	Tunnel Mining Site Option 2 -West Potomac Park (South)	Made land; no potential for late Pleistocene/early Holocene deposits; few intact deposits associated with temporary structures	No additional investigations
3	Emergency Overflow Structure Option 1 – West Potomac Park (North)	Made land; no potential for deeply buried late Pleistocene floodplain horizons within made land and in adjacent river	No additional investigations
3	Emergency Overflow Structure Option 2 – West Potomac Park (South)	Made land; no potential for deeply buried late Pleistocene floodplain horizons within made land and in adjacent river	No additional investigations
3	Emergency Overflow Structure Option 3 – CSO 022	Structure remains found at two locations; potential for buried bulkhead	Phase II NRHP evaluation
4	Ventilation Control Facility and UPIRS Diversion Structure	Known Historic period resources present; numerous additional Historic period structures mapped adjacent to the known site area	Phase II at any locations within and adjacent to known site 51NW120; Phase IB survey in areas adjacent to known archaeological site 51NW120
5	CSO 020 Control Option 1 – 23rd Street NW / Constitution Avenue NW	Made land; no potential for late Pleistocene/early Holocene deposits	No additional investigations
5	CSO 020 Control Option 2 – Lincoln Memorial Volleyball Courts	Made land; no potential for late Pleistocene/early Holocene deposits	No additional investigations
6	CSO 021 Control	Proximity to Potomac River for Native American resources; mapped structures and wharves dating to the mid-nineteenth century	Completed
7	CSO 022 Control Option 1 – Waterfront / Existing Outfall	Structure remains found at two locations; potential for buried bulkhead	Phase II NRHP evaluation
7	CSO 022 Control Option 2 – Virginia Avenue NW / 27th Street NW	Known Historic period resources present; mapped structures indicate high potential for additional Historic period resources	Phase IB survey east of 27th Street NW
8	CSO 024 Control and UPI Diversion Structure	Proximity to creek indicates high potential for Native American resources; mapped structures indicate high potential for Historic period resources	No further work if subsurface impacts confined to roadways; if not, Phase IB survey in non-roadway areas

Component Number	Area	Rationale	Recommendations
9	CSO 027 Control Option 1 – K Street NW / Georgetown Waterfront Park (with or without emergency surge relief pipe)	Known Historic period and Native American archaeological site 51NW075 present; potential for docks, wharves, and bulkheads in river	Phase II NRHP evaluation (terrestrial) of 51NW075; evaluate results of terrestrial investigations to determine if underwater geophysical survey is needed
9	CSO 027 Control Option 2 – Georgetown Waterfront Park (with or without emergency surge relief pipe)	Known Historic period and Native American archaeological site 51NW075 present; potential for docks, wharves, and bulkheads in river	Phase II NRHP evaluation (terrestrial) of 51NW075; evaluate results of terrestrial investigations to determine if underwater geophysical survey is needed
10	CSO 028 Control (with or without emergency surge relief pipe)	Layer of soft-paste brick in three core profiles and artifact concentration in fourth at 7.5 feet below surface; Native American artifact in core at 13.5 feet below surface	Phase II NRHP evaluation (terrestrial); monitoring or geotechnical core extraction and analysis (submerged)
11	CSO 029 Control Option 1 – Canal Road NW / Georgetown University Southwest Entrance	Layer of soft paste bricks at 16 feet below surface in core extracted at location of mid-nineteenth-century structure location; expanded construction area contains Historic period archaeological site 51NW112	Phase IB survey in expanded construction area; Phase II NRHP evaluation at diversion chamber
11	CSO 029 Control Option 2 – South of Georgetown University	Proximity to Potomac River for Native American resources	Phase IB survey
12	JBAB Connection	Geoarchaeological assessment identified buried terrestrial landform in close proximity to Anacostia River	Phase IB investigations did not locate archaeological resources. Section 106 consultation was concluded.

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4.0 ALTERNATIVES

DC Water previously evaluated numerous general strategies for CSO control in the development of its Combined Sewer System Long Term Control Plan (DC Water 2002), which was modified in 2015. The alternatives evaluated herein represent continued refinement of the selected control strategies for the CSOs discharging to the Potomac River, and include Alternative A, the no-action alternative; and Alternative B, the proposed action, intended to comply with the Amended Federal Consent Decree.

Within the description of the proposed action (Alternative B), the project is broken into individual project components, which include the tunnel, tunnel mining site, CSO diversion facilities and associated near surface structures, a ventilation control facility, and an emergency overflow structure. Several project components presented under the proposed action include options for siting the facilities that represent the outcome of preliminary engineering design and analysis, as well as extensive collaboration between NPS, DC Water, local and federal government agencies, and community stakeholders. Component options are also presented that were previously considered but have been dismissed from detailed analysis because they would result in unacceptable impacts or costs or are not feasible due to constructability or other engineering constraints.

The Amended Federal Consent Decree requires and defines the process for DC Water to assess the practicability of utilizing GI to provide CSO control for CSOs 027, 028, and 029. Should GI be determined practicable by DC Water (subject to EPA approval), DC Water would construct GI facilities to control the impervious acreage required by the Amended Federal Consent Decree for one or more of these sewersheds in lieu of the corresponding portion(s) of the tunnel and associated infrastructure. Should GI be determined impracticable, DC Water would control these CSOs utilizing the tunnel system as originally envisioned. This chapter describes the full build-out scenario for both the tunnel and GI CSO control technologies. The final CSO control technologies would be selected in accordance with the processes defined in the Amended Federal Consent Decree.

4.1 ALTERNATIVE A: NO-ACTION

Alternative A, the no-action alternative, represents continued operation and maintenance of the existing combined sewer system that is tributary to the Potomac River CSO outfalls. Previously completed improvements to the combined sewer system, implemented by DC Water as part of its Nine Minimum Controls (NMC) and Phase 1 CSO Control Programs, have resulted in an estimated 38 percent reduction in CSOs to the Potomac River by volume from the 1996 baseline condition. However, the system continues to discharge untreated combined sewage during rain events on a regular basis. Under the no-action alternative, CSOs would continue to occur at current levels. CSO frequency and magnitude are highly dependent on weather conditions, occurring at higher levels in wetter years and lower levels in drier years. It is estimated that approximately 74 overflows occur to the Potomac River in a year of average rainfall, resulting in a total discharge of approximately 654 million gallons (DC Water 2015). The no-action alternative would also result in failure to meet DC Water's obligations under its Amended Federal Consent Decree and NPDES Permit, subjecting it to significant stipulated penalties and other regulatory enforcement actions.

Figure 4-1 shows schematically the configuration of the existing sewer system connected to the CSOs along the Potomac River. The system consists of an interconnected network of pipelines and pumping stations constructed by the federal government in various phases since the late 1800s. The last major addition to the system, consisting of the Upper Potomac Interceptor Relief Sewer, Potomac Pumping Station, and Potomac Force Mains, was constructed in the 1960s and 1970s. Each outfall is controlled by one or more existing CSO regulator structure that divert dry weather flows to the Rock Creek and / or Potomac Pumping Stations for conveyance to Blue Plains. During rain events, when the capacities of the downstream pipelines and pumping stations are exceeded, these structures allow flow to be released directly to the Potomac River, reducing the risk of surface flooding and basement backups.

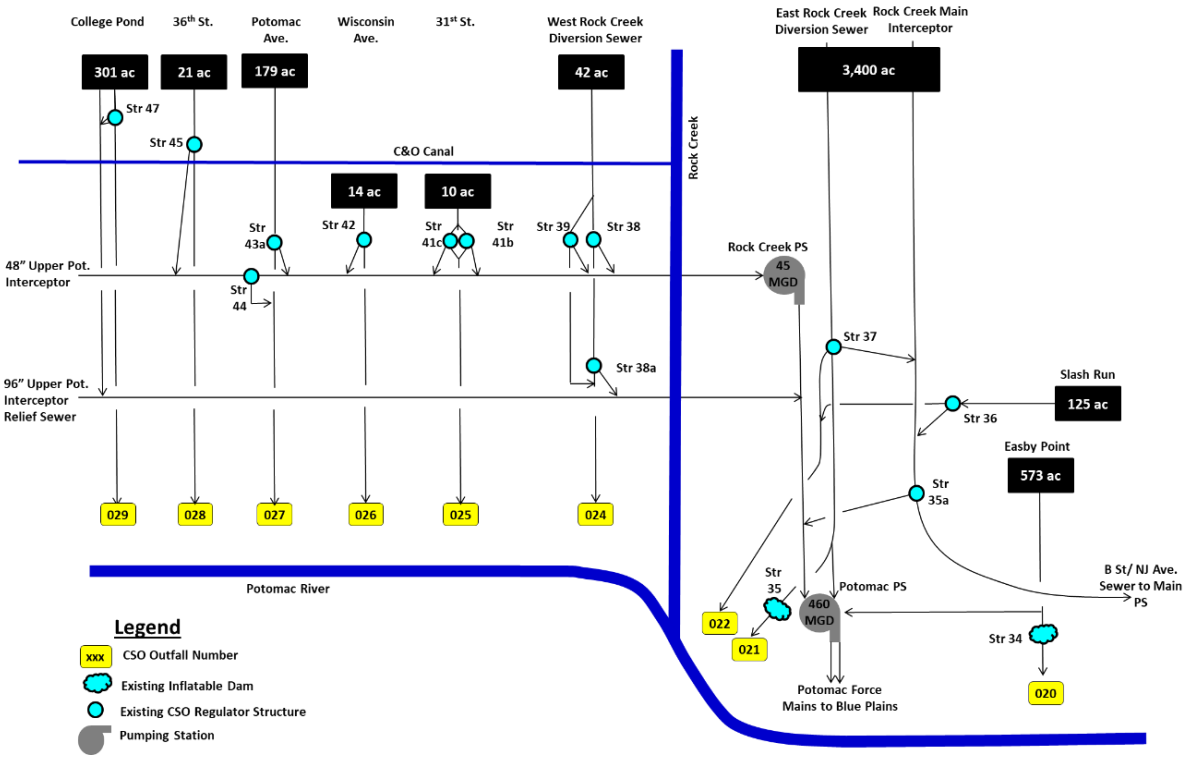

Figure 4-1: Existing Sewer System Configuration

4.2 ALTERNATIVE B: CONSTRUCT POTOMAC RIVER TUNNEL TO COMPLY WITH AMENDED CONSENT DECREE

Alternative B, the proposed action, would involve construction of the Potomac River Tunnel and supporting infrastructure to provide control for seven CSO outfalls along the Potomac River. The proposed controls are estimated to reduce CSOs to the Potomac River by 93 percent by volume and limit their frequency to an estimated four times in a year of average rainfall. Instead of being discharged directly to the river, the captured combined sewage would be stored and conveyed to Blue Plains for treatment. The proposed action would comply with DC Water's Amended Federal Consent Decree and NPDES Permit. The Amended Federal Consent Decree requires the tunnel to be operational by March 23, 2030.

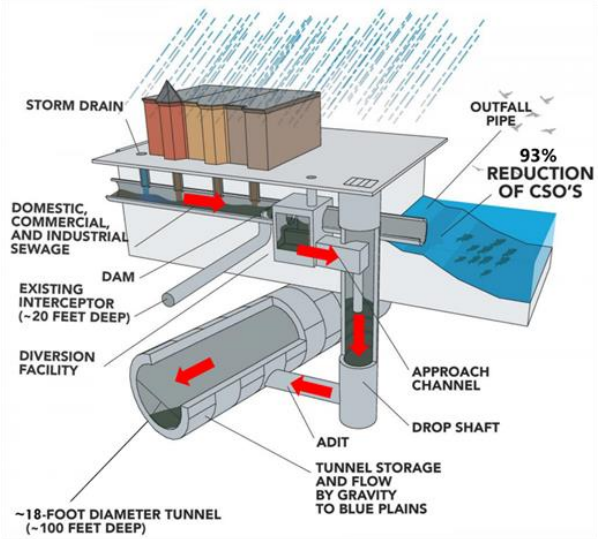

Figure 4-2: Graphic Illustration of Typical Diversion Facility

The overall extent of the proposed action is shown on **Figure 1-1**, which includes the general locations for the tunnel alignment, near surface structures, and drop shafts, as well as the sewersheds for which GI is being evaluated for CSO control. Most of the near surface structures are designed to divert flow from the existing combined sewer system to the tunnel during rain events. These diversion facilities have been proposed downstream of the existing CSO regulator structures to avoid the need for constructing multiple structures for each outfall or significant reconstruction / reconfiguration of the existing sewer network. A typical diversion facility includes a diversion chamber, approach channel, drop shaft, and adit (**Figure 4-2**).

For clarity in presentation of the options considered for each proposed facility, the Potomac River Tunnel has been broken down into project components, listed in **Table 4-1**. Although one option must ultimately be selected for each component, DC Water has identified opportunities where project components can be combined to reduce the number of construction areas that are described under the individual components.

Table 4-1: Components of the Potomac River Tunnel Project

Component Number	Component Description	Component Number	Component Description
1	Tunnel Corridor	8	CSO 024 Control and UPI Diversion Structure
2	Tunnel Mining Site	9	CSO 027 Control*
3	Emergency Overflow Structure	10	CSO 028 Control*
4	Ventilation Control Facility and UPIRS Diversion Structure	11	CSO 029 Control*
5	CSO 020 Control	12	Tunnel Connection to Existing Shaft at JBAB
6	CSO 021 Control	-	Green Infrastructure
7	CSO 022 Control		

*CSO control method pending GI practicability determination required by Amended Federal Consent Decree

In the preparation of this AOE Report, the proposed facilities have been developed to a conceptual level. Figures provided are intended to represent the general scope of proposed facilities and anticipated construction areas. Specific structure layouts and construction limits are subject to change due to further design refinement, collection of additional site data (such as geotechnical borings), and / or coordination with third parties during the negotiation of permits and easements.

4.2.1 COMPONENT 1 – TUNNEL CORRIDOR

A deep underground tunnel is proposed to provide the primary means of storage and conveyance of captured combined sewage. The proposed tunnel would be located approximately 75 to 125 feet below the ground surface and would be constructed in geologic stratigraphy consisting of alluvium, clays, silts, sands, decomposed bedrock, and bedrock. The tunnel would be constructed using a telescoping cylindrical steel 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 would excavate the soil and rock as hydraulic cylinders jack the machine forward. Openings in the cutterhead would control the rate of material excavation that would be conveyed to the surface for disposal.

At its southeastern downstream end, the proposed tunnel would connect to the existing Blue Plains Tunnel within a drop shaft at JBAB, which has been designed to receive the tunnel with minimal surface impact. To the northwest, the tunnel would extend to the most upstream CSO to be captured pending the outcome of the GI practicability determination (CSO 024, 027, 028, or 029).

Due to the proposed use of a TBM to construct the tunnel, minimal surface disruption would be required between the various CSO diversion facilities. Along the tunnel alignment, surface activities are anticipated to be limited to installation of wells, ground monitoring arrays, seismographs, and other nonintrusive instrumentation to monitor the tunneling operations. Depending on subsurface conditions, short-term access may be required at certain points along the alignment to perform ground improvement such as jet grouting, dewatering, and ground freezing to facilitate mining operations or maintenance and / or repair of the TBM. The proposed corridor within which the Potomac River Tunnel would be constructed is shown on **Figure 1-2**.

4.2.2 COMPONENT 2 – TUNNEL MINING SITE

The tunnel mining site would be utilized to construct a mining shaft, lower and launch the TBM, remove excavated materials, and deliver concrete segments that would form the tunnel. The surrounding area would be used to store materials and equipment in support of tunneling operations. Multiple mining site locations were considered along the tunnel alignment. Potential mining sites were selected by identifying sites with adequate available open space, sufficient construction access and haul routes, and preferable geologic stratigraphy. Ground conditions vary significantly between the northern and southern portions of the tunnel alignment, so mining sites near the transition in ground conditions have been identified to allow for optimization of mining operations for the northern rock and southern soil tunneling drives. Two mining site options have been selected for detailed analysis.

4.2.2.1 Tunnel Mining Site Option 1 – West Potomac Park (North)

Tunnel Mining Site Option 1 would consist of approximately 6 acres within the area bounded by Independence Avenue SW, Ohio Drive SW, and West Basin Drive SW within National Mall and Memorial Parks. A conceptual layout of the mining site is shown in **Figure 4-3**. Access to the site would be from Independence Avenue SW and Ohio Drive SW. In addition to the mining shaft, a below-grade ventilation control vault would be constructed. Prior to initiating construction of the Potomac River Tunnel, DC Water, and the Potomac Electric Power Company (PEPCO) would extend high voltage electricity distribution lines to the mining site to deliver power for the TBM from an existing line to the east near 14th Street SW. The high voltage lines would be installed via trenching within the roadway of Independence Avenue SW or within East Basin Drive SW and Ohio Drive SW.

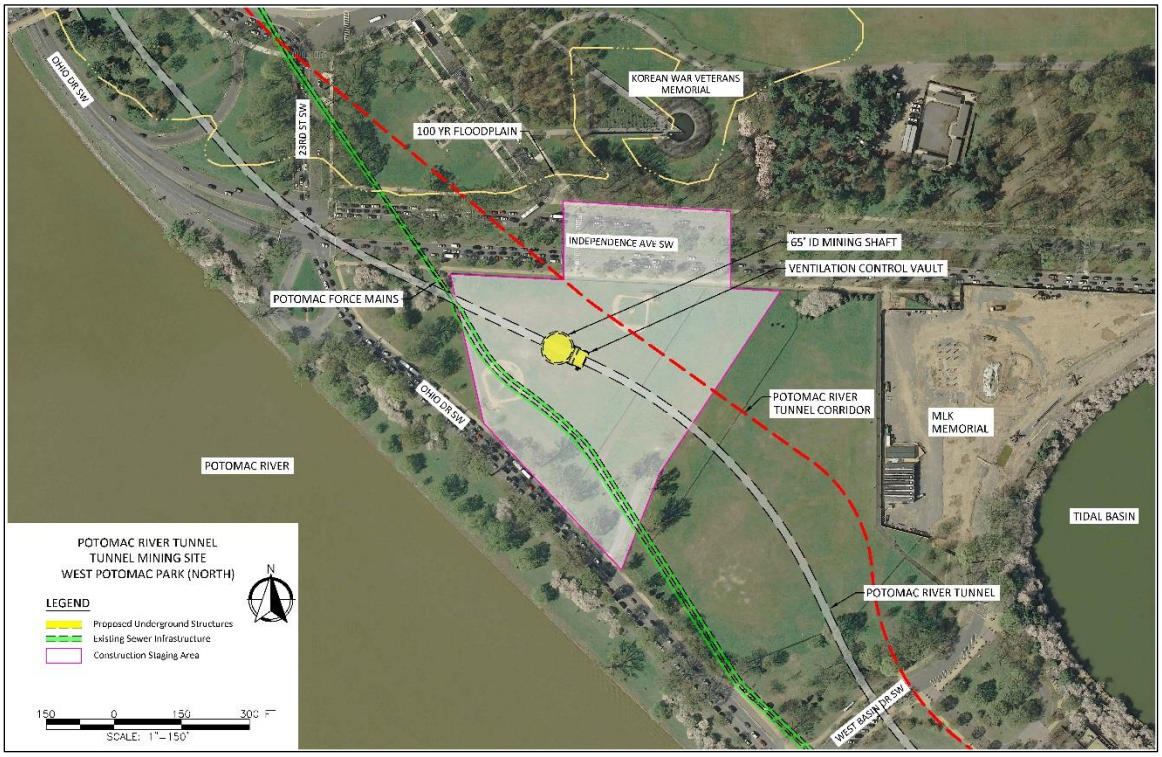

Figure 4-3: Tunnel Mining Site Option 1 – West Potomac Park (North)

Upon completion of construction, the site would be restored substantially to the existing conditions, with only manholes, hatches, and other structure access points visible at grade; however, because the elevation of the site is below the 100-year floodplain, tunnel ventilation grating, electrical panels serving the ventilation equipment, and access points to the ventilation control vault would be extended above-grade by approximately 5 feet to protect the tunnel system and ventilation equipment. The above-grade portion(s) of the ventilation vault would be approximately

900 square feet. Visible features would be integrated into the existing landscape and / or screened to the extent practicable, and the final site layout and restoration would be coordinated with the NPS and other stakeholders during the final design and permitting process.

4.2.2.2 Tunnel Mining Site Option 2 – West Potomac Park (South)

Tunnel Mining Site Option 2 would consist of approximately 6 acres within the area bounded by Ohio Drive SW, West Basin Drive SW, and the Franklin Delano Roosevelt Memorial within National Mall and Memorial Parks. A conceptual layout of the mining site is shown in **Figure 4-4**. Access to the site would be from Ohio Drive SW. In addition to the mining shaft, a below-grade ventilation control vault would be constructed. Similar to Option 1 described in *Section 4.2.2.1*, high voltage distribution lines would be installed prior to construction to deliver power to the TBM. Site restoration activities and visible at-and above-grade features would also be similar to Option 1.

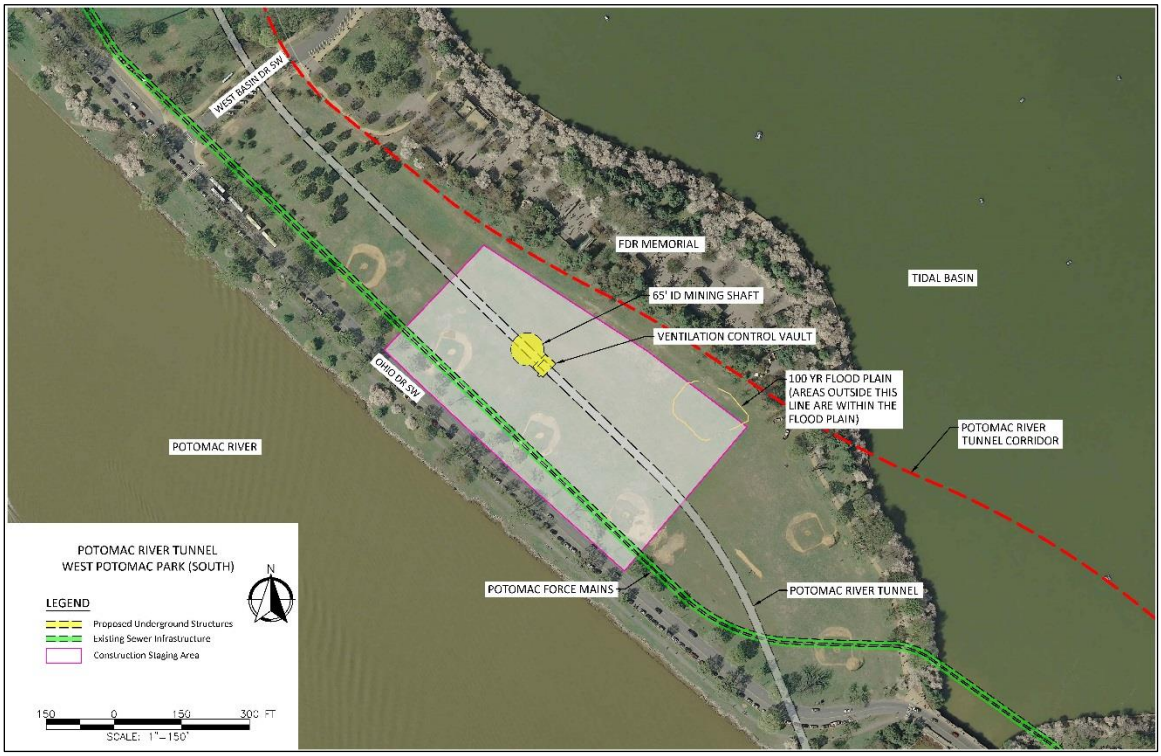

Figure 4-4: Tunnel Mining Site Option 2 – West Potomac Park (South)

4.2.3 COMPONENT 3 – EMERGENCY OVERFLOW STRUCTURE

An emergency overflow structure is necessary to protect the tunnel and upstream infrastructure during rain events that exceed the system's capacity or occur when the system is already full. The underground facility would be fitted with an approximately 200-foot horizontal weir to limit discharge velocities to the river, a baffle wall and bar screens to remove solids / floatables, bulkhead gates to isolate portions of the facility for maintenance, and tide gates to prevent backflow from the river to the tunnel system. Two options have been selected for detailed analysis, both of which allow co-location of construction of the emergency overflow structure with other proposed facilities to minimize the number of construction areas and reduce potential impacts.

4.2.3.1 Emergency Overflow Structure Option 1 – West Potomac Park (North)

Emergency Overflow Structure Option 1 is located along Ohio Drive SW between Independence Avenue SW and West Basin Drive SW and would be located adjacent to the Tunnel Mining Site Option 1 described in *Section 4.2.2.1*. The total construction area, including the overflow structure and mining site, would consist of approximately 11 acres;

however, it is anticipated that construction would be sequenced such that not all the area would be in use at any given time. Below-grade channels would be constructed to connect the mining shaft to the emergency overflow structure. Construction of this option would require relocation or temporary support in place of the existing Potomac Force Mains. During construction, temporary closures and / or relocation of Ohio Drive SW travel lanes and sidewalks would be required. A conceptual layout of the site is shown in **Figure 4-5**. Upon completion of construction, the outfall of the overflow structure would be visible from the river, but the upland portion of the site would be restored substantially to the existing conditions, with manholes, hatches, and other structure access points visible at grade to provide access to the operable portions of the facility for maintenance and repair. Also, riprap outfall protection would be installed on the river bottom to reduce the potential for erosion during tunnel overflow events. Visible features would be integrated into the existing landscape and / or screened to the extent practicable, and the final site layout and restoration would be coordinated with the NPS and other stakeholders during the final design and permitting process.

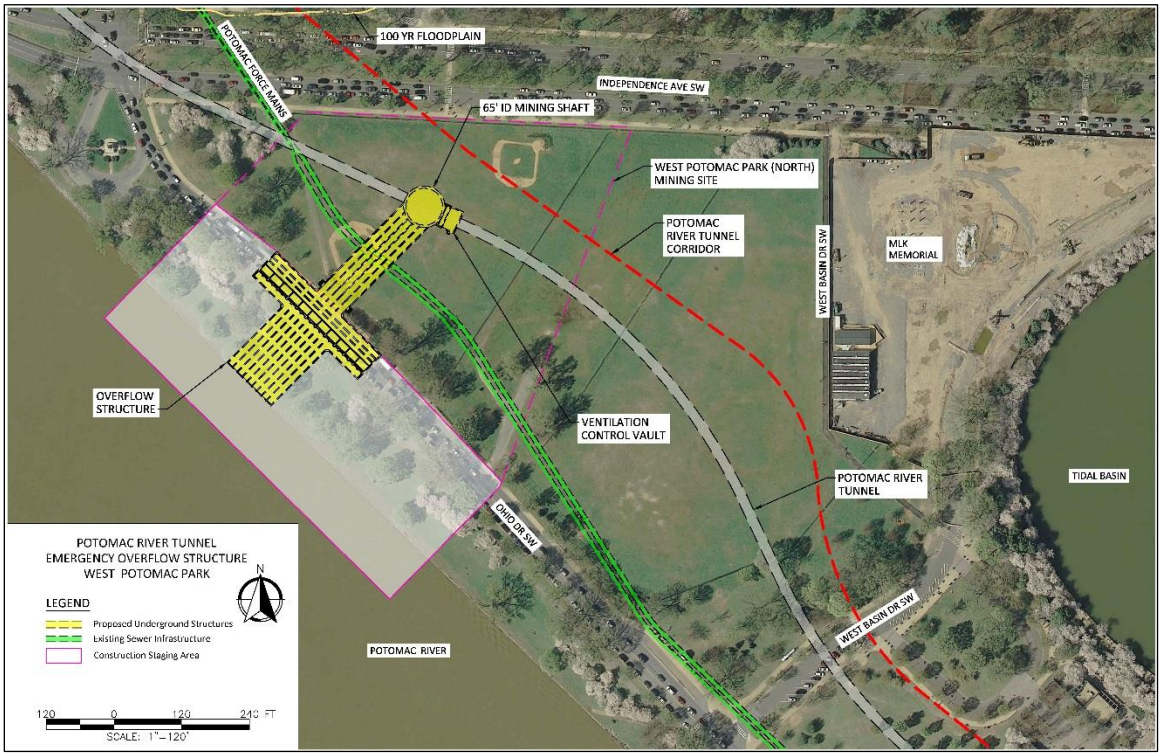

Figure 4-5: Emergency Overflow Structure Option 1 – West Potomac Park (North)

4.2.3.2 Emergency Overflow Structure Option 2 – West Potomac Park (South)

Emergency Overflow Structure Option 2 is located along Ohio Drive SW between West Basin Drive SW and the Inlet Bridge and would be located adjacent to Tunnel Mining Site Option 2 as described in *Section 2.2.2.2*. A conceptual layout of the site is shown in **Figure 4-6**. Except for the location and layout of the construction area, aspects of this option are similar to those described under Option 1 in *Section 4.2.3.1*.

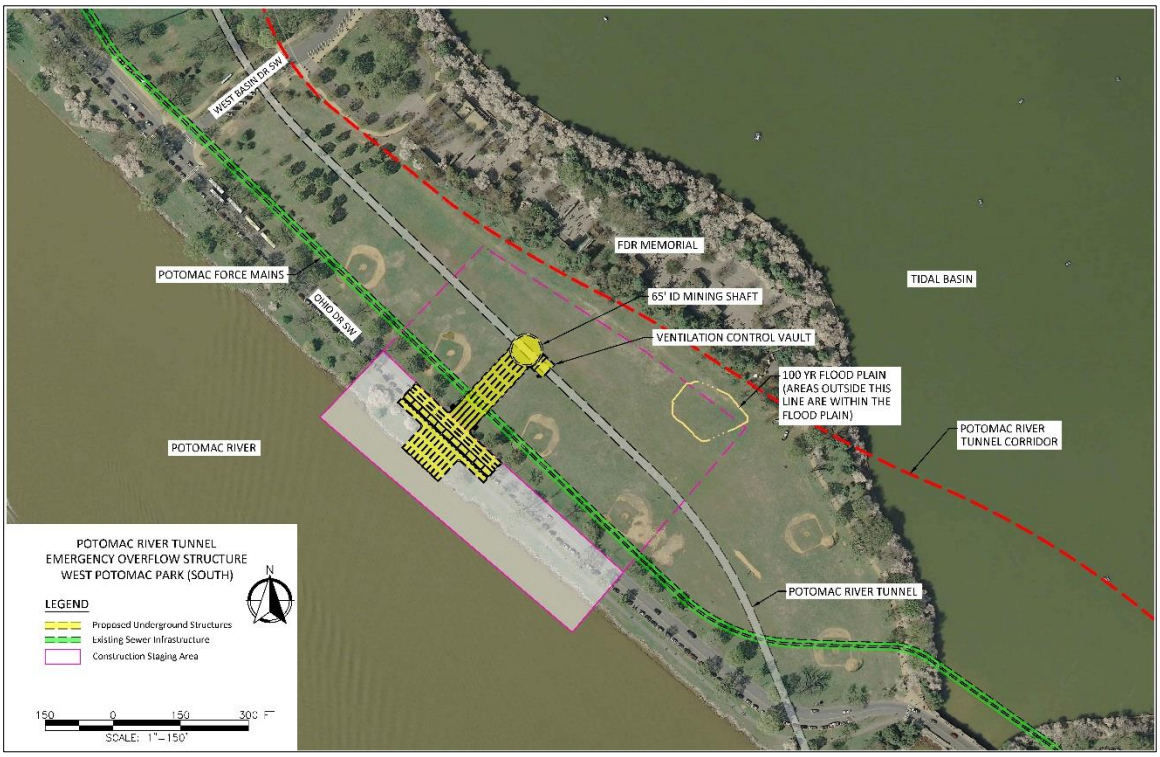

Figure 4-6: Emergency Overflow Structure Option 2 – West Potomac Park (South)

4.2.3.3 Emergency Overflow Structure Option 3 – CSO 022

Emergency Overflow Structure Option 3 is located at CSO 022 west of Rock Creek and Potomac Parkway NW, just south of Virginia Avenue NW, and consists of approximately three acres. Due to the limited space available at the site, temporary construction staging space would need to be created in the river utilizing barges or temporary fill adjacent to the existing seawall. The site combines construction of a below grade emergency overflow structure with a CSO 022 Control diversion structure, potentially consolidating construction of multiple facilities into one area. A conceptual layout of the construction site is shown in **Figure 4-7**. During construction, the segments of the Rock Creek Trail within the site would be detoured to maintain pedestrian and bicycle access. Upon completion of construction, the outfall of the overflow structure would be visible from the river, but the upland portion of the site would be restored substantially to the existing conditions, with only manholes, hatches, and other structure access points visible at grade to provide access to the operable portions of the facility for maintenance and repair. Also, riprap outfall protection would be installed on the river bottom to reduce the potential for erosion during tunnel overflow events. The final site layout and restoration would be coordinated with the NPS and other stakeholders during the final design and permitting process.

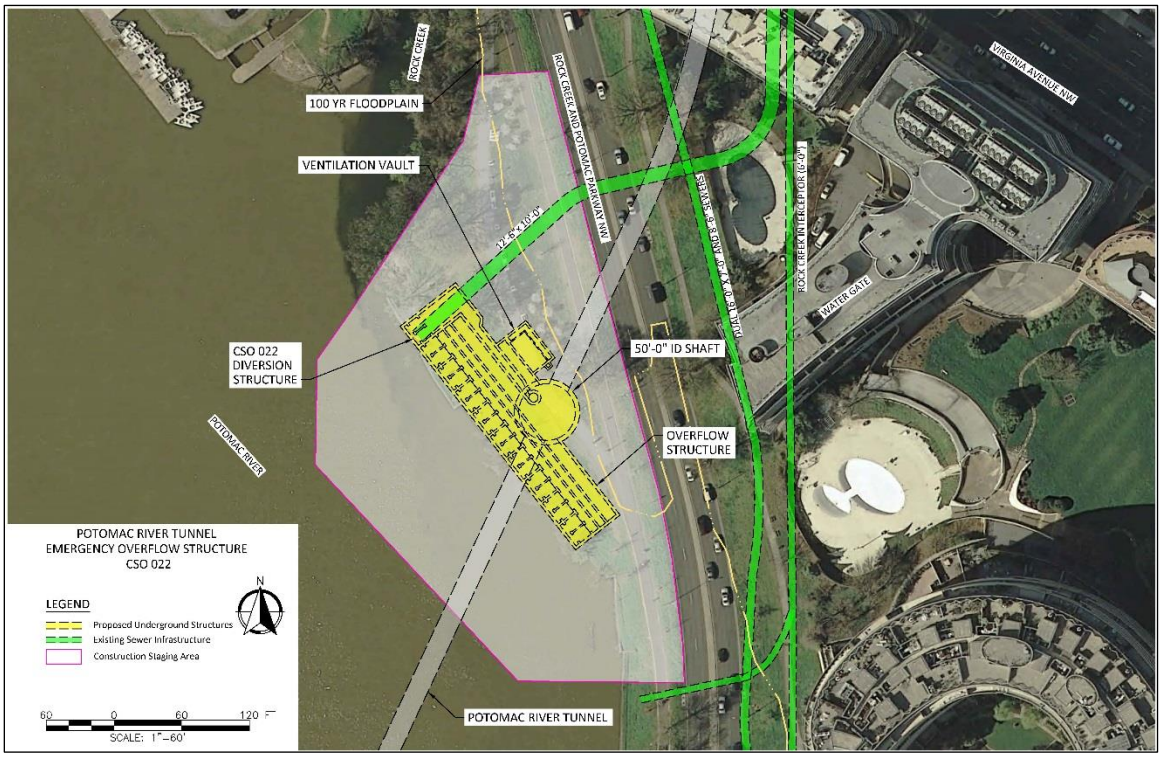

Figure 4-7: Emergency Overflow Structure Option 3 – CSO 022

4.2.4 COMPONENT 4 – VENTILATION CONTROL FACILITY AND UPIRS DIVERSION STRUCTURE

A ventilation control facility is proposed to help regulate air flow throughout the tunnel system. The ventilation control facility would house an active fan-driven odor control system to maintain a negative air pressure within the tunnel and treat fugitive emissions during dry weather conditions and wet weather events. Pending final design, the facility may be constructed either as an above-grade one- to two-story building, consisting of approximately 6,000 square feet, or as a below-grade vault. If constructed as a below-grade vault, portions of the facility would need to be located above grade to provide for egress in compliance with applicable building codes, for access to control systems, and for flood protection for sensitive equipment. One location for the ventilation control facility is presented for detailed analysis.

The proposed ventilation control facility site is located within the open area bounded by Rock Creek and Potomac Parkway NW, 27th Street NW, Virginia Avenue NW, and the ramp from eastbound Whitehurst Freeway to Interstate 66. In addition to the ventilation control facility, an underground diversion facility for the Upper Potomac Interceptor Relief Sewer (UPIRS) would be constructed. In conjunction with other proposed diversion structures along the tunnel alignment, this structure would allow the Potomac River Tunnel to be used as backup for the Potomac Pumping Station in the event of a power failure or other temporary shutdown. A conceptual layout of the site is shown in **Figure 4-8**. The location and configuration of the facilities, as well as site restoration, would be determined during final design and permitting in coordination with the property owners and owners of adjacent infrastructure.

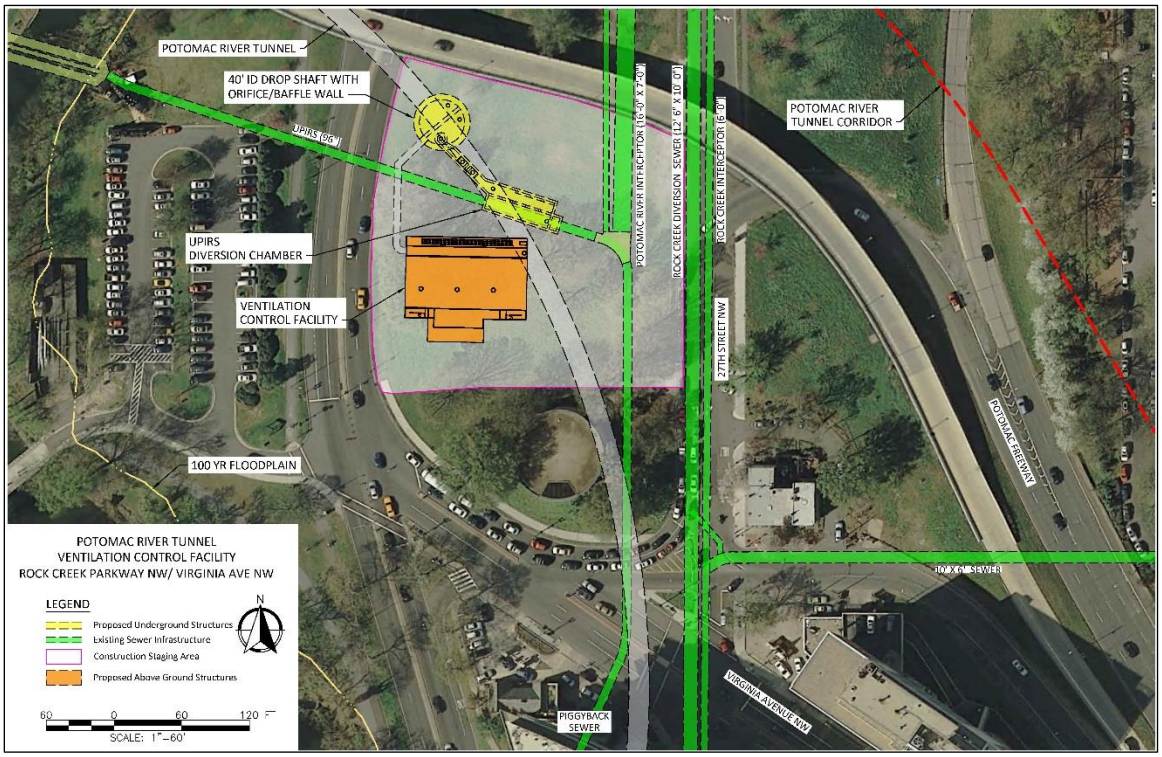

Figure 4-8: Ventilation Control Facility and UPIRS Diversion Structure Site

4.2.5 COMPONENT 5 – CSO 020 CONTROL

CSO 020 discharges to the Potomac River adjacent to Rock Creek and Potomac Parkway NW, just northwest of the Lincoln Memorial. A facility is required to divert a minimum of 297 MGD of combined sewer flows from the existing outfall to the tunnel. Two options for the CSO 020 diversion facility are presented for detailed analysis.

4.2.5.1 CSO 020 Control Option 1 – 23rd Street NW / Constitution Avenue NW

CSO 020 Control Option 1 would be located within the open area southwest of the intersection of 23rd Street NW and Constitution Avenue NW and consists of approximately two acres (**Figure 4-9**). A diversion chamber, approach channel, and drop shaft would be constructed in the northwest portion of the site near the existing sewer. The diversion chamber would be retrofitted to the existing 11.25-foot x 11.25-foot outfall sewer to divert wet weather flow up to the design capacity to the tunnel for storage. An approach channel would be constructed to convey flow from the diversion chamber to the drop shaft. Pending detailed design, a below grade ventilation control vault may be constructed to mitigate fugitive emissions from the shaft. Should the ventilation control vault be constructed, above grade electrical cabinets would be necessary to serve the ventilation equipment. An underground adit would be constructed using trenchless methods connecting the tunnel to the diversion structure drop shaft. Upon completion of construction, the site would be restored substantially to the existing conditions, with only electrical cabinets (if needed), manholes, hatches, and other structure access points visible at grade; however, because a portion of the site is below the 100-year floodplain elevation, tunnel ventilation grating and access points to the ventilation control vault would be extended above-grade by approximately 3 to 5 feet or located in a higher elevation portion of the site to protect the tunnel system and ventilation equipment. The above-grade portion(s) of the ventilation vault would be approximately 300 square feet. The final site layout and restoration would be coordinated with the NPS and other stakeholders during the final design and permitting process.

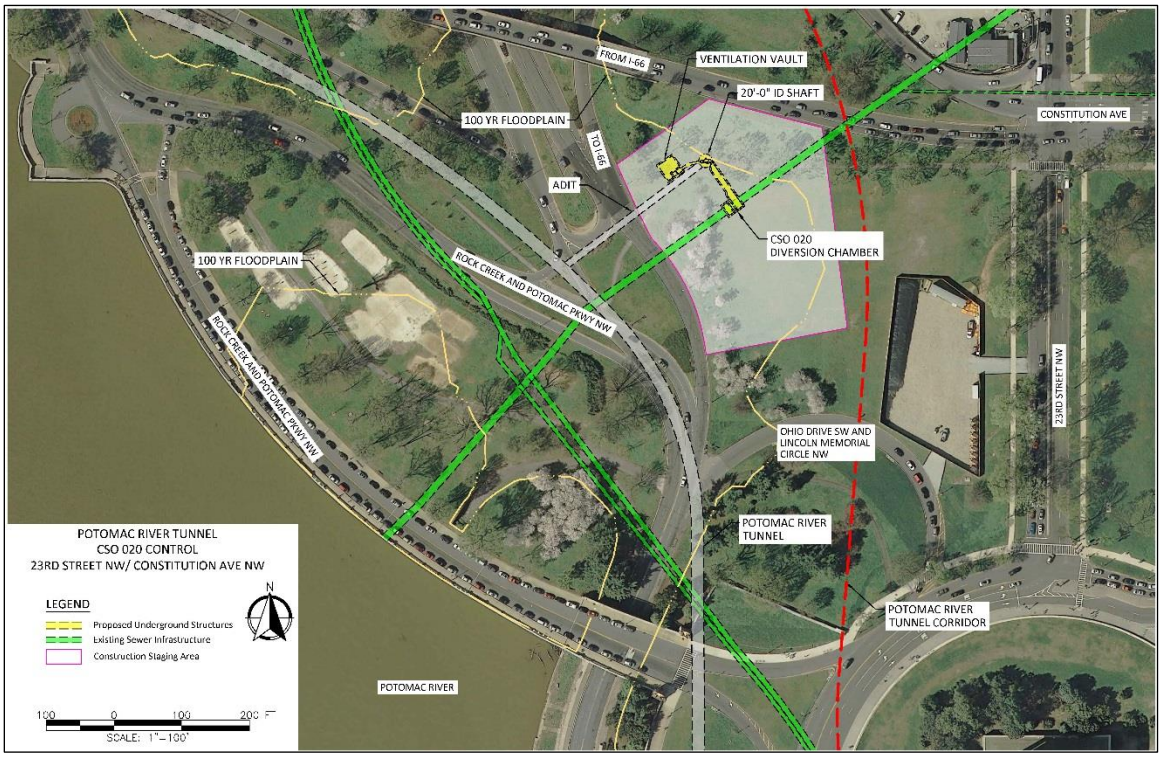

Figure 4-9: CSO 020 Control Option 1 – 23rd Street NW / Constitution Avenue NW

4.2.5.2 CSO 020 Control Option 2 – Lincoln Memorial Volleyball Courts

CSO 020 Control Option 2 would be constructed at the volleyball courts between Rock Creek Parkway NW and Ohio Drive NW and consists of approximately two acres (**Figure 4-10**). A diversion chamber, approach channel, and drop shaft would be constructed in the southeastern portion of the site near the existing sewer. Except for the location and layout of the construction area, aspects of this option are similar to those described under Option 1 in *Section 4.2.5.1*.

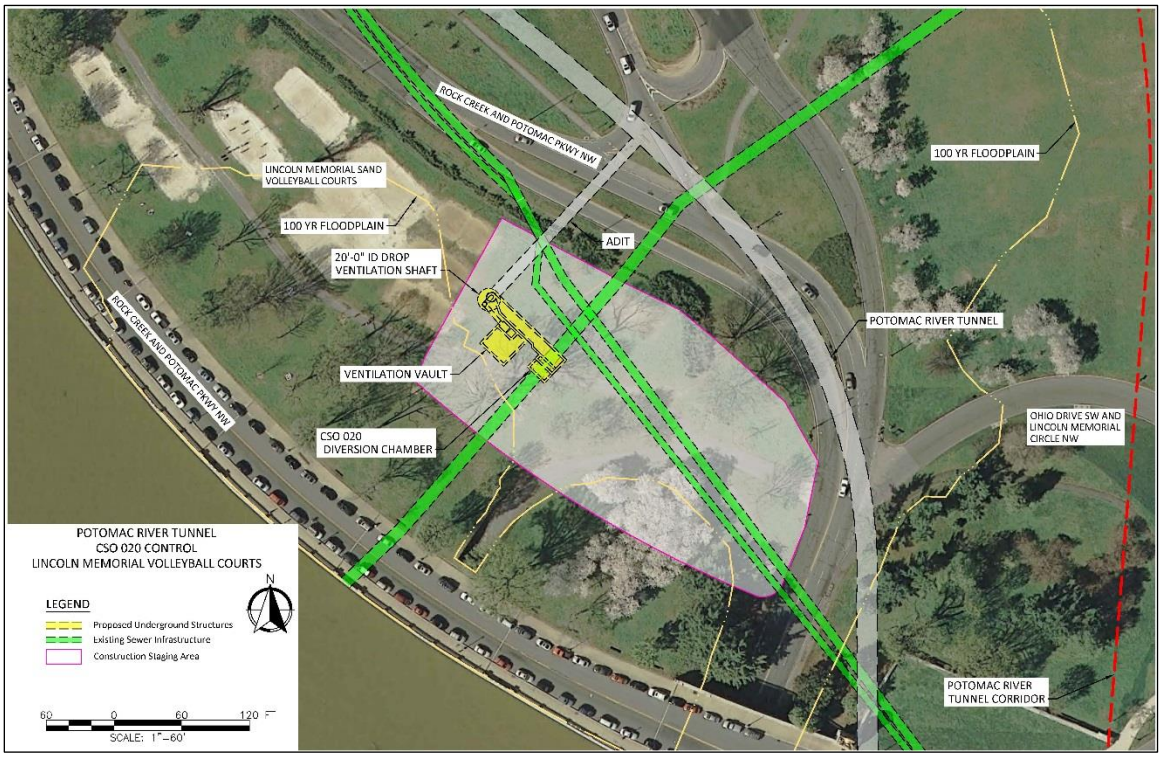

Figure 4-10: CSO 020 Control Option 2 – Lincoln Memorial Volleyball Courts

4.2.6 COMPONENT 6 – CSO 021 CONTROL

The CSO 021 diversion structure, approach channel, drop shaft, and ventilation control vault are currently being constructed concurrently with the Kennedy Center Expansion Project as depicted on **Figure 4-11**. The CSO 21 diversion facilities have been integrated into the final site design of the expanded Kennedy Center facilities to minimize impacts. Work proposed at this site as part of the Potomac River Tunnel would include construction of an underground adit to connect CSO 021 diversion structure drop shaft to the tunnel. The adit would be constructed from within the tunnel with all excavated materials removed via the tunnel mining shaft. Other work includes the removal of temporary fill within the diversion chamber and installation of equipment within the ventilation control vault. All work would be closely coordinated with the Kennedy Center to minimize impacts to its operations.

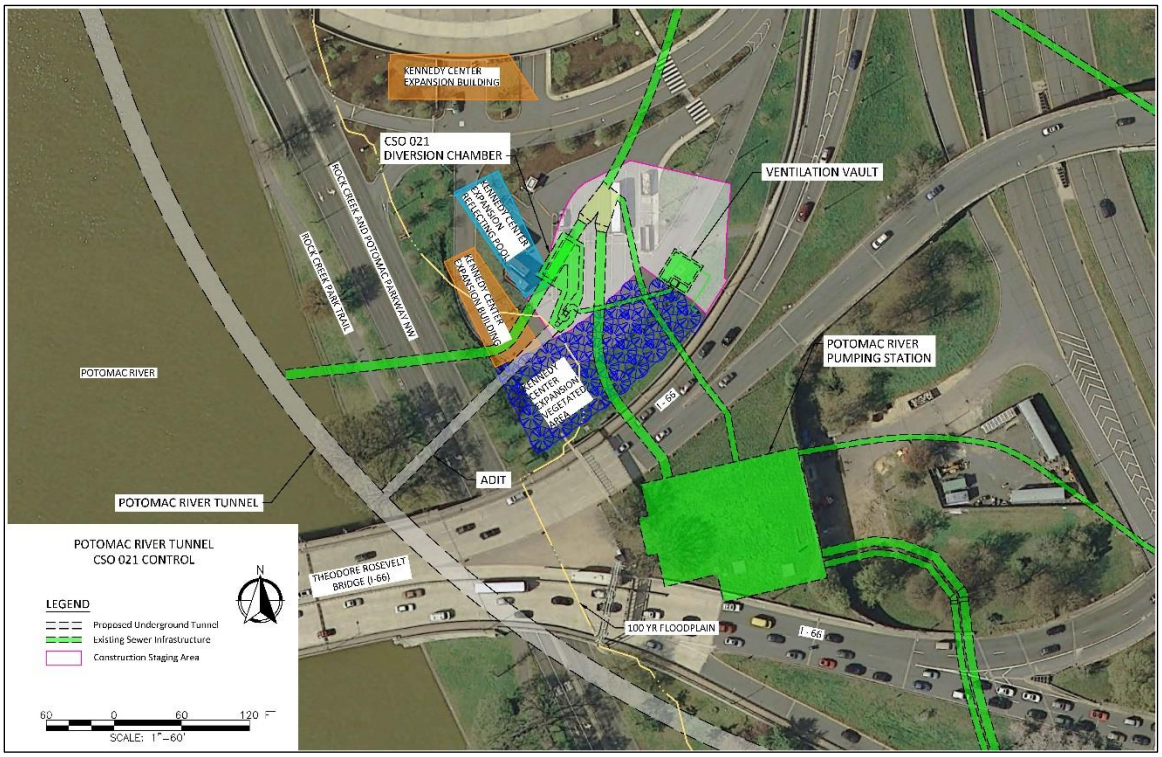

Figure 4-11: CSO 021 Control

4.2.7 COMPONENT 7 – CSO 022 CONTROL

CSO 022 discharges to the Potomac River just downstream of the mouth of Rock Creek. A facility is required to divert a minimum of 333 MGD of combined sewer flows from the existing outfall to the tunnel. Two options for the CSO 022 Control diversion facilities are presented herein for detailed analysis.

4.2.7.1 CSO 022 Control Option 1 – Waterfront / Existing Outfall

CSO 022 Control Option 1 would be constructed adjacent to the existing outfall, just west of Rock Creek Parkway NW and south of Virginia Avenue NW and consists of approximately one and a half acres (**Figure 4-12**). A diversion chamber, approach channel, and drop shaft would be constructed near the existing sewer. The diversion chamber would be retrofitted to the existing 12.5-foot x 10-foot outfall sewer to divert wet weather flow up to the design capacity to the tunnel for storage. An approach channel would be constructed to convey flow from the diversion chamber to the drop shaft. Pending detailed design, a below grade ventilation control vault may be constructed to mitigate fugitive emissions from the shaft. Should the ventilation control vault be constructed, above grade electrical cabinets would be necessary to serve the ventilation equipment. An underground adit would be constructed using trenchless methods connecting the tunnel to the diversion structure drop shaft. During construction, the segments of the Rock Creek Trail within the site would be detoured if necessary to maintain pedestrian and bicycle access. Upon completion of construction, the site would be restored substantially to the existing conditions, with only electrical cabinets (if needed), manholes, hatches, and other structure access points visible at grade; however, because the site is below the 100-year floodplain elevation, tunnel ventilation grating and access points to the ventilation control vault would be extended above-grade by approximately 3 to 5 feet or located on a portion of the site outside of the floodplain to protect the tunnel system and ventilation equipment. The above-grade portion(s) of the ventilation vault would be approximately 300 square feet. The final site layout and restoration would be coordinated with the NPS and other stakeholders during the final design and permitting process.

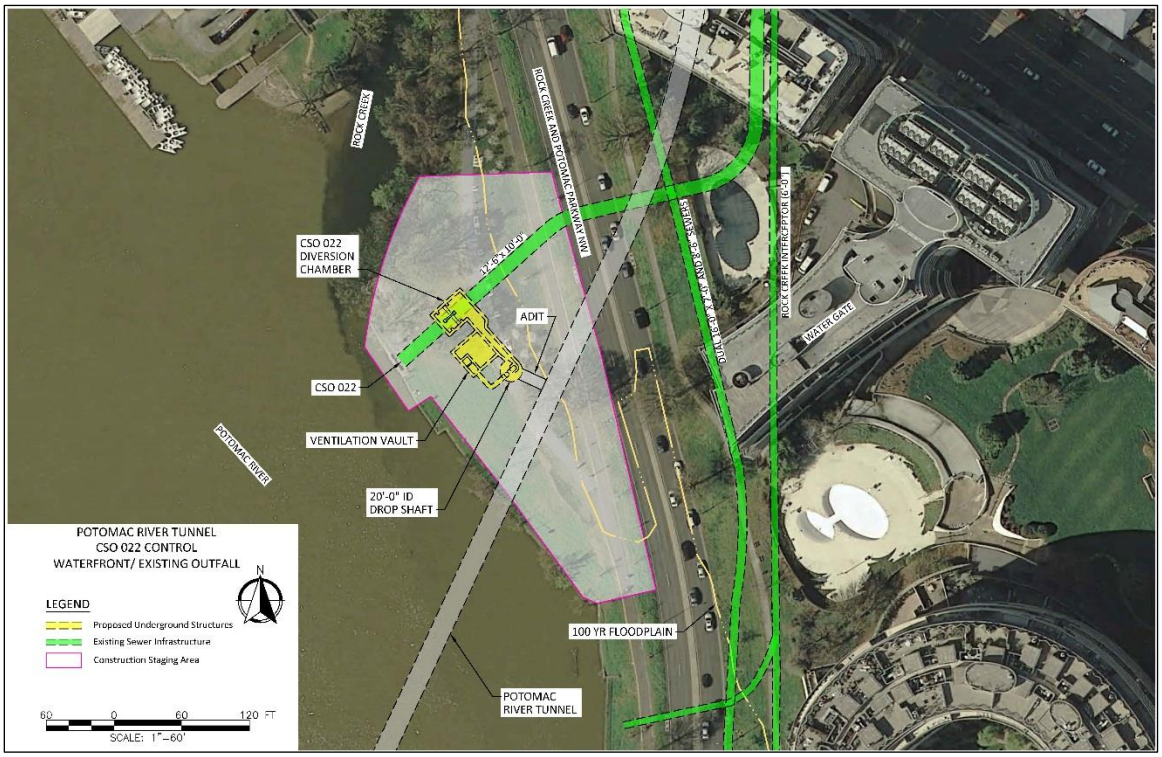

Figure 4-12: CSO 022 Control Option 1 – Waterfront / Existing Outfall

4.2.7.2 CSO 022 Control Option 2 – Virginia Avenue NW / 27th Street NW

CSO 022 Control Option 2 would be constructed at the intersection of Virginia Avenue NW and 27th Street NW (**Figure 4-13**). A diversion chamber, approach channel, and drop shaft would be constructed adjacent to and parallel to the existing sewer and 27th Street NW. During construction, lane and sidewalk closures would be required along Virginia Avenue NW and 27th Street NW. Maintenance of traffic controls, detours, and phasing of construction would be utilized to the extent practicable to maintain circulation of vehicular and pedestrian traffic. Upon completion of construction, the site would be restored substantially to the existing conditions, with only manholes, hatches, and other structure access points visible at grade. The final site layout and restoration would be coordinated with the District Department of Transportation (DDOT) and other stakeholders during the final design and permitting process. Selection of this option would allow for combination of construction of the CSO 022 Control with construction of the ventilation control facility and UPIRS diversion structure.

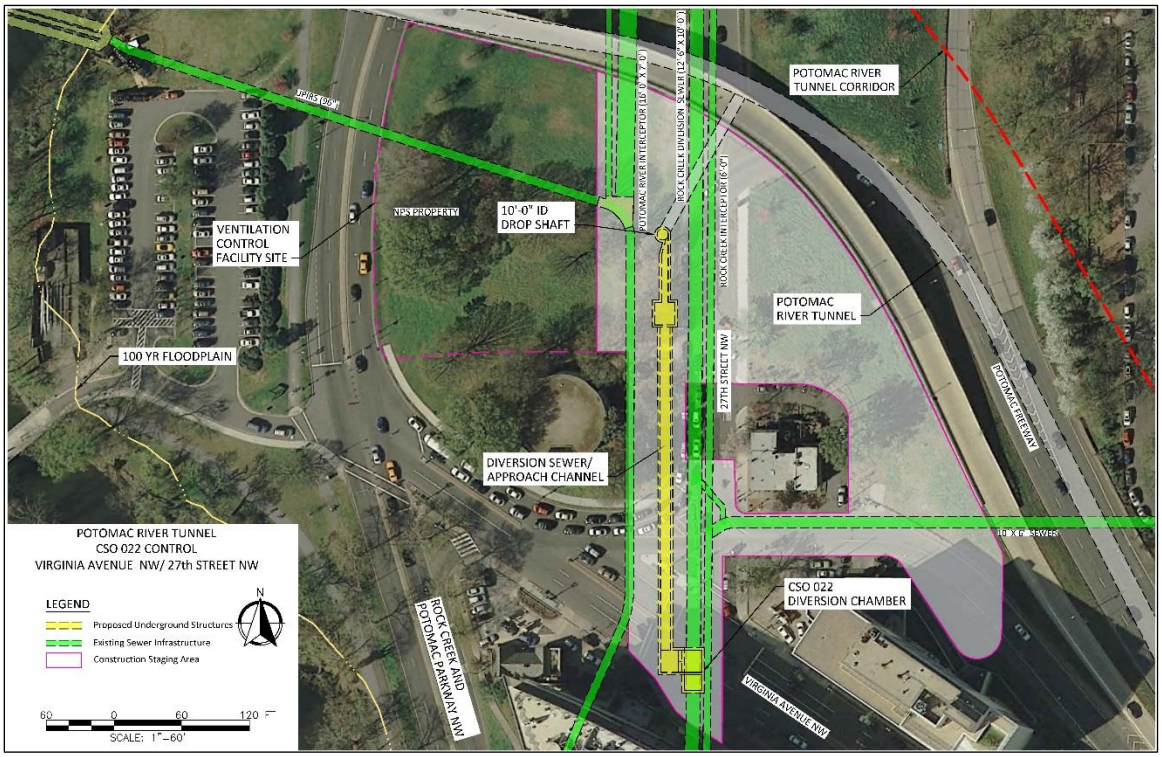

Figure 4-13: CSO 022 Control Option 2 – Virginia Avenue NW / 27th Street NW

4.2.8 COMPONENT 8 – CSO 024 CONTROL AND UPI DIVERSION STRUCTURE

CSO 024 discharges to the Potomac River just upstream of the mouth of Rock Creek at the end of 30th Street NW. A facility is required to divert a minimum of 66 MGD of combined sewer flows from the existing outfall to the tunnel. One facility layout is presented for detailed analysis.

The CSO 024 Control would be constructed at the intersection of K Street NW and 30th Street NW (**Figure 4-14**). Two diversion chambers, an approach channel, and a drop shaft would be constructed within public space at the intersection. The diversion chamber would be retrofitted to the existing 9.5-foot x 7.5-foot outfall sewer to divert wet weather flow up to the design capacity to the tunnel for storage. A separate diversion structure would be constructed on the Upper Potomac Interceptor (UPI), allowing the tunnel to be utilized as backup for the Rock Creek Pumping Station in the event of a power failure or other temporary shutdown. An approach channel would be constructed to convey flow from the diversion chambers to the drop shaft. Pending detailed design, a below grade ventilation control vault may be constructed to mitigate fugitive emissions from the shaft. Should the ventilation control vault be constructed, above grade electrical cabinets would be necessary to serve the ventilation equipment. An underground adit would be constructed using trenchless methods connecting the drop shaft to the tunnel. During construction, vehicular and pedestrian traffic would be detoured around the construction area. Construction would be phased to minimize traffic impacts to the extent feasible. Upon completion of construction, the site would be restored substantially to the existing conditions, with only electrical cabinets (if needed), manholes, hatches, and other structure access points visible at grade; however, because the site is below the 100-year floodplain elevation, tunnel ventilation grating and access points to the ventilation control vault would be extended above-grade by approximately 3 to 5 feet to protect the tunnel system and ventilation equipment. The above-grade portion(s) of the ventilation vault would be approximately 300 square feet. The final site layout and restoration would be coordinated with DDOT (including coordination of designs with the proposed Union Station to Georgetown Streetcar) and other stakeholders during the final design and permitting process.

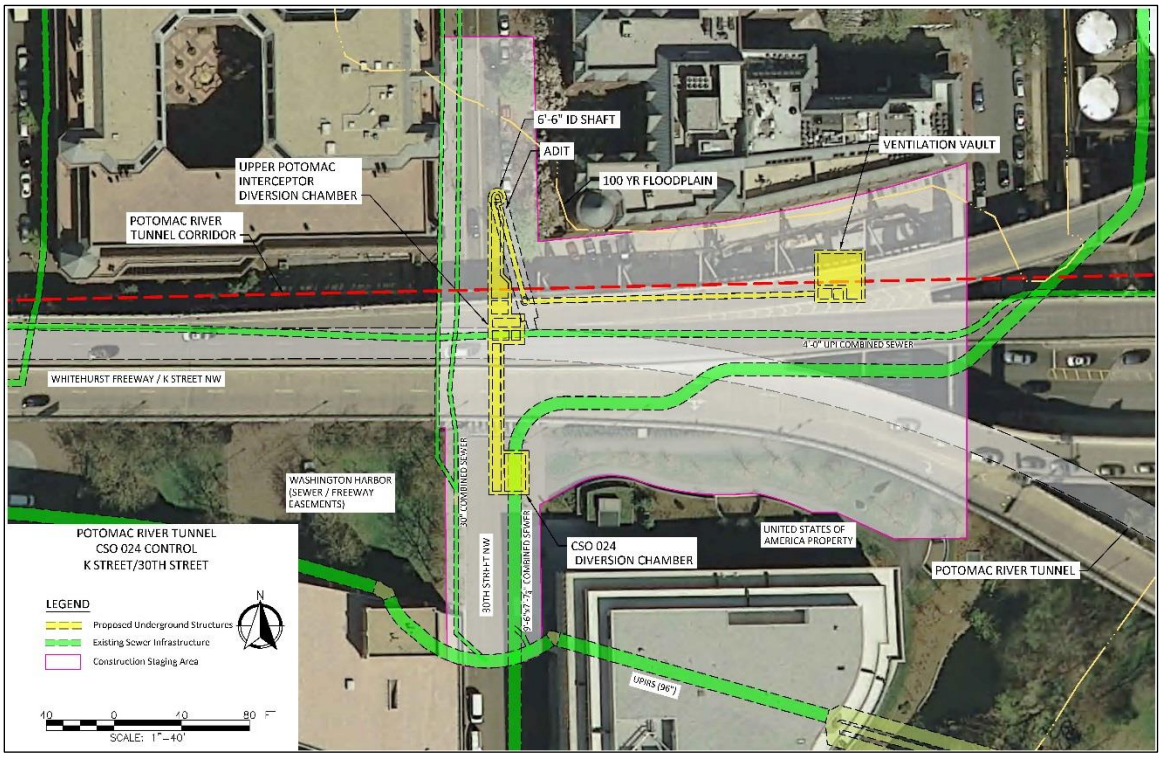

Figure 4-14: CSO 024 Control and UPI Diversion Structure

4.2.9 COMPONENT 9 – CSO 027 CONTROL

CSO 027 discharges to the Potomac River at Georgetown Waterfront Park south of K Street NW between 33rd Street NW and Potomac Street NW. A facility is required to divert a minimum of 92 MGD of combined sewer flows from the existing outfall to the tunnel. Two site options for the CSO 027 diversion facilities are presented for detailed analysis, with two conceptual layouts provided for each option depending on the location selected for an emergency surge relief pipe required to protect the low-lying area between CSO 024 and 028 from flooding due to transient flows within the tunnel system during extreme filling events. The emergency surge relief pipe may also be constructed as part of the CSO 028 Control.

4.2.9.1 CSO 027 Control Option 1 – K Street NW / Georgetown Waterfront Park

CSO 027 Control Option 1 would be located at the intersection of K Street NW and Potomac Street NW (**Figure 4-15**). This reduces the amount of construction within Georgetown Waterfront Park by locating structures within K Street NW (beneath Whitehurst Freeway). A diversion chamber, approach channel, and drop shaft would be constructed within public space at the intersection. Temporary lane and sidewalk closures would be required within K Street NW and Potomac Street NW; maintenance of traffic controls would be provided to maintain vehicular and pedestrian circulation to the extent practicable. The diversion chamber would be retrofitted to the existing 8-foot x 7-foot outfall sewer to divert wet weather flow up to the design capacity to the tunnel for storage. An approach channel would be constructed to convey flow from the diversion chamber to the drop shaft. A below grade ventilation control vault would be constructed to allow air to expel from the tunnel, with equipment provided to mitigate fugitive emissions. Because the site is below the 100-year floodplain elevation, tunnel ventilation grating and access points to the ventilation control vault would be extended above-grade by approximately 3 to 5 feet to protect the tunnel system and ventilation equipment. Due to the need to extend these structures above grade, they could not be placed within the street or sidewalks and would need to be constructed within the adjacent park space. The above-grade portion(s) of the ventilation vault would be approximately 150 square feet. Upon completion of construction, the site would be restored substantially to existing conditions, with only electrical cabinets, manholes, hatches, and other structure access points

visible at- and above-grade. The final site layout and restoration would be coordinated with DDOT, NPS, and other stakeholders during the final design and permitting process.

Should CSO 027 be selected as the location for the emergency surge relief pipe, it would require connection to the river, and thus would require construction through Georgetown Waterfront Park to connect to the Potomac River. The above-grade portion(s) of the ventilation vault would increase to approximately 800 square feet. CSO 027 Control Option 1 including the emergency surge relief pipe is shown in **Figure 4-16**.

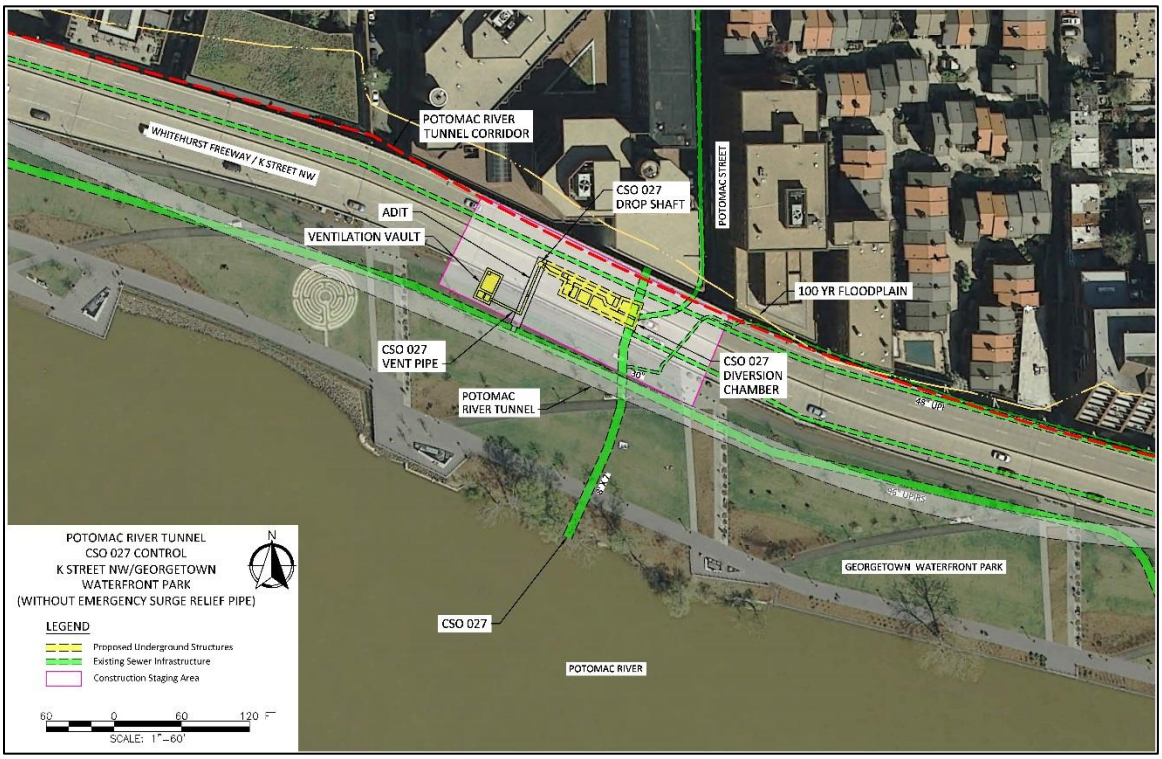

Figure 4-15: CSO 072 Control Option 1 - K Street NW / Georgetown Waterfront Park (without Emergency Surge Relief Pipe)

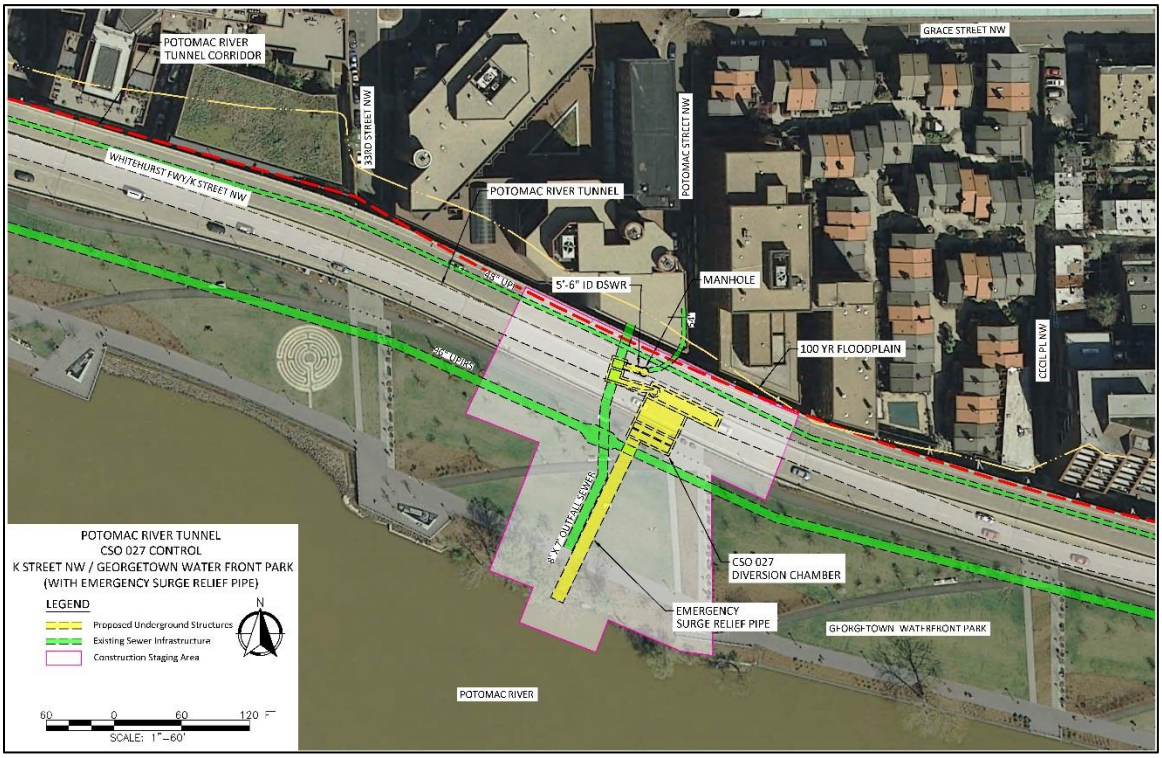

Figure 4-16: CSO 027 Control Option 1 – K Street NW / Georgetown Waterfront Park (with Emergency Surge Relief Pipe)

4.2.9.2 CSO 027 Control Option 2 – Georgetown Waterfront Park

CSO 027 Control Option 2 would be located within Georgetown Waterfront Park (**Figure 4-17** without emergency surge relief pipe, **Figure 4-18** with emergency surge relief pipe). A diversion chamber, approach channel, and drop shaft would be constructed within the park. Except for the location and layout of the construction area, aspects of this option are similar to those described under Option 1 in *Section 4.2.9.1*. However, this option substantially reduces construction within K Street NW.

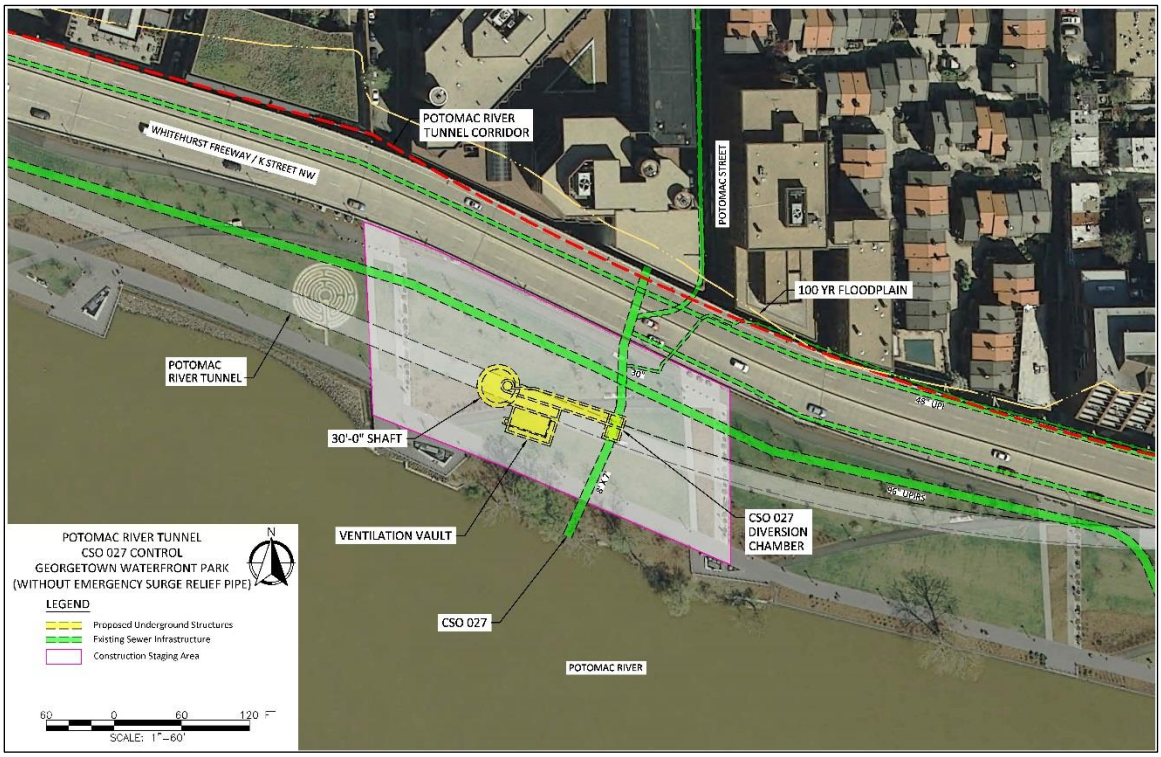

Figure 4-17: CSO 027 Control Option 2 - Georgetown Waterfront Park (without Emergency Surge Relief Pipe)

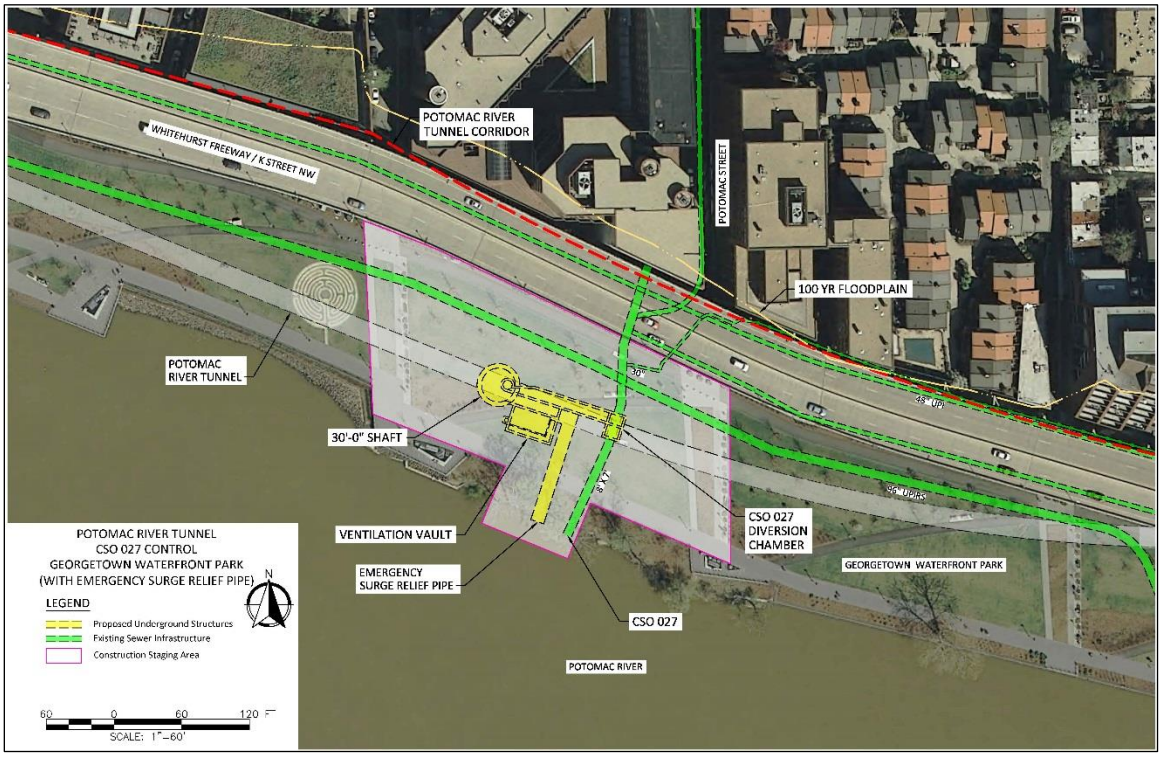

Figure 4-18: CSO 027 Control Option 2 – Georgetown Waterfront Park (with Emergency Surge Relief Pipe)

4.2.10 COMPONENT 10 – CSO 028 CONTROL

CSO 028 discharges to the Potomac River just west of the Potomac (Alexandria) Aqueduct remains. A facility is required to divert a minimum of 9 MGD of combined sewer flows from the existing outfall to the tunnel. One site is

presented for detailed analysis, with two conceptual layouts provided depending on the location selected for an emergency surge relief pipe required to protect the low-lying area between CSO 024 and CSO 028 from flooding due to transient flows within the tunnel system during extreme filling events. The emergency surge relief pipe may also be constructed as part of the CSO 027 Control.

The CSO 028 Control would be constructed along the Capital Crescent Trail adjacent to the C&O Canal embankment just west of the Potomac (Alexandria) Aqueduct remains (**Figure 4-19** without emergency surge relief pipe, **Figure 4-20** with emergency surge relief pipe). The diversion chamber would be retrofitted to the existing 4-foot x 4-foot outfall sewer to divert wet weather flow up to the design capacity to the tunnel for storage. An approach channel would be constructed to convey flow from the diversion chamber to the drop shaft. Because the site is below the 100-year floodplain elevation, access to the drop shaft and the tunnel ventilation grating would be extended above the elevation of the trail by approximately 8 feet to protect the tunnel system from flooding and contain transient flows within the shaft during extreme tunnel filling events. The elevated portion of the drop shaft would be approximately 700 square feet if the site is selected for the emergency surge relief pipe, and approximately 300 square feet if the emergency surge relief pile is constructed at CSO 027 instead. In either case, it would be incorporated into the existing embankment to minimize visual impacts, and exposed portions would be finished with materials coordinated between DC Water, NPS, and other stakeholders. During construction, a temporary detour would be constructed to maintain pedestrian, bicycle, and vehicular access along the Capital Crescent Trail. Upon completion of construction, the site would be restored substantially to the existing conditions, with only the upper drop shaft, manholes, hatches, and other structure access points visible at- and above-grade. The final site layout and restoration would be coordinated with the NPS and other stakeholders during the final design and permitting process.

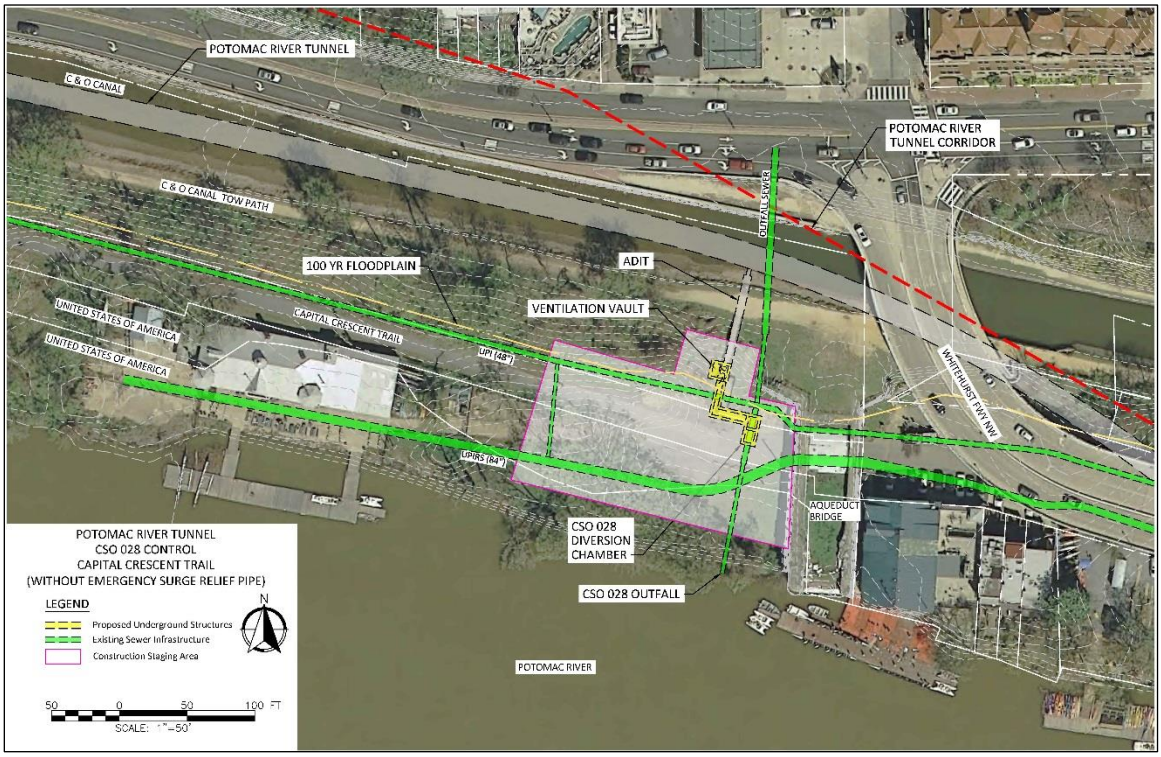

Figure 4-19: CSO 028 Control (without Emergency Surge Relief Pipe)

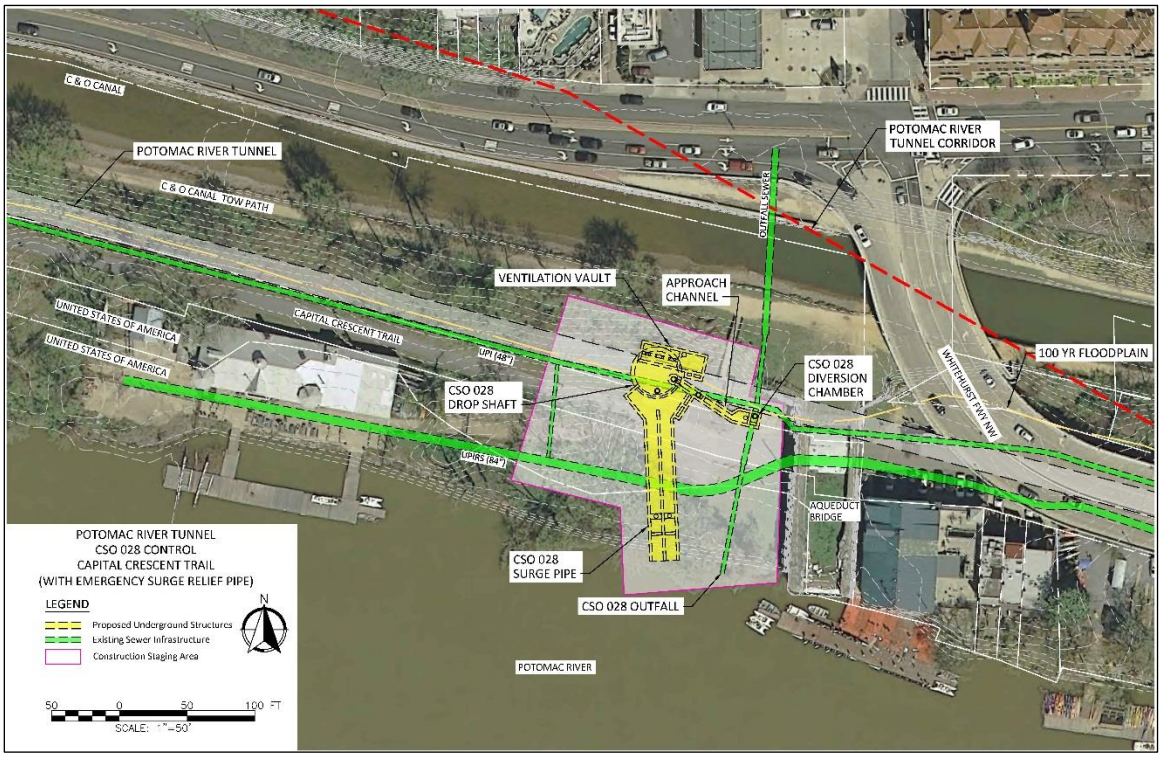

Figure 4-20: CSO 028 Control (with Emergency Surge Relief Pipe)

4.2.11 COMPONENT 11 – CSO 029 CONTROL

CSO 029 discharges to the Potomac River along the Capital Crescent Trail south of Georgetown University approximately 1,500 feet west of the Potomac (Alexandria) Aqueduct remains. A facility is required to divert a minimum of 133 MGD of combined sewer flows from the existing outfall to the tunnel. Two facility layout options are presented for detailed analysis.

4.2.11.1 CSO 029 Control Option 1 – Canal Road NW / Georgetown University Southwest Entrance

CSO 029 Control Option 1 would be constructed along Canal Road NW at the southwest entrance to Georgetown University (**Figure 4-21**). A diversion chamber, approach channel, and drop shaft would be constructed near the existing sewer. The diversion chamber would be retrofitted to the existing 7-foot diameter outfall sewer to divert wet weather flow up to the design capacity to the tunnel for storage. An approach channel would be constructed to convey flow from the diversion chamber to the drop shaft. A below grade ventilation control vault would be constructed to ventilate air from the tunnel during filling events, with equipment provided to mitigate fugitive emissions. Above grade electrical cabinets would be necessary to serve the ventilation equipment. Pending final design, retaining wall(s) may be required to provide additional level working space for construction of the diversion structure and / or shaft or the relocation of roadways. These walls may be temporary or permanent. The configuration and materials of the wall(s) would be coordinated with Georgetown University, DDOT and other stakeholders as appropriate. During construction, lane and sidewalk closures would be required along Canal Road NW and the southwest access to Georgetown University. Construction of the diversion structure would be phased to maintain access to vehicles entering and exiting Georgetown University. Maintenance of traffic controls, detours, and phasing of construction would be utilized to maintain circulation of vehicular and pedestrian traffic to the extent practicable. Upon completion of construction, the site would be restored substantially to the existing conditions, with only electrical cabinets, manholes, ventilation grating, hatches, and other structure access points visible at grade. The final site layout and restoration would be coordinated with DDOT, Georgetown University, and other stakeholders during the final design and permitting process.

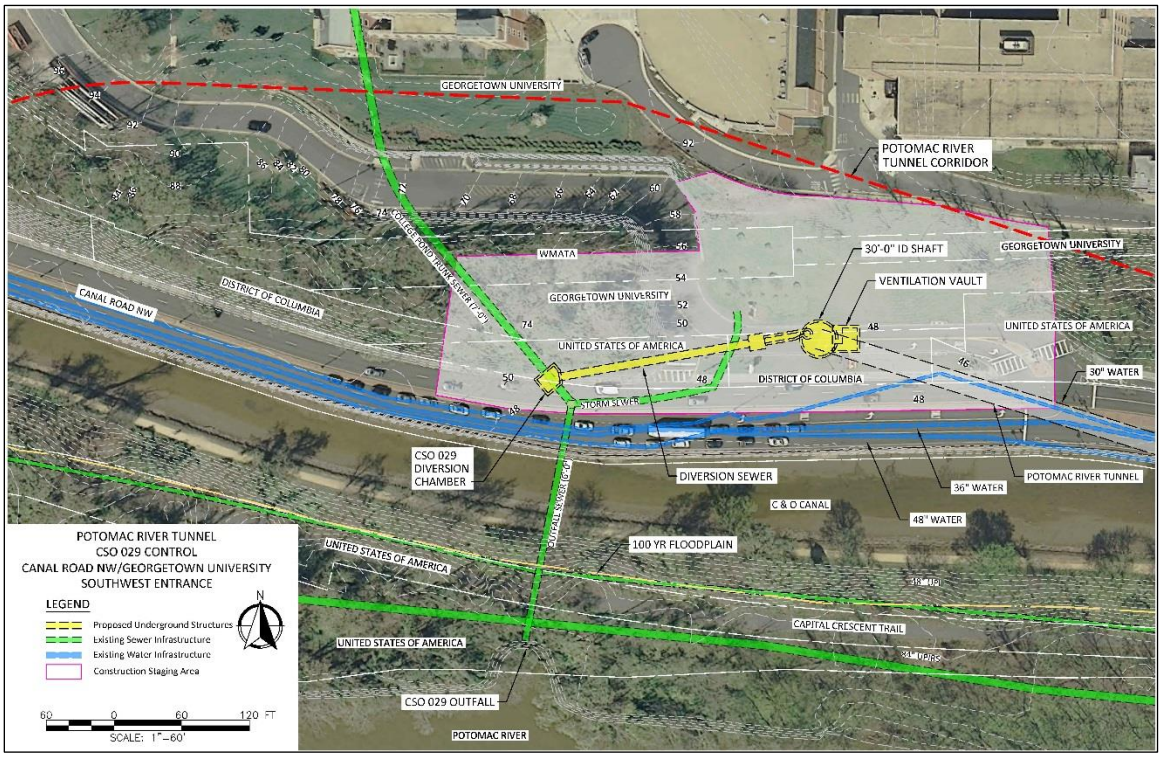

Figure 4-21: CSO 029 Control Option 1 – Canal Road NW / Georgetown University Southwest Entrance

4.2.11.2 CSO 029 Control Option 2 – South of Georgetown University

CSO 029 Control Option 2 would be constructed between Canal Road NW and the southwest entrance to Georgetown University (**Figure 4-22**). A diversion chamber, approach channel, and drop shaft would be constructed near the existing sewer. Except for the location and layout of the construction area, aspects of this option are similar to those described under Option 1 in *Section 4.2.11.1*. The southwest access to Georgetown University would remain open for through traffic, though temporary closures of portions of the entrance may be necessary during construction.

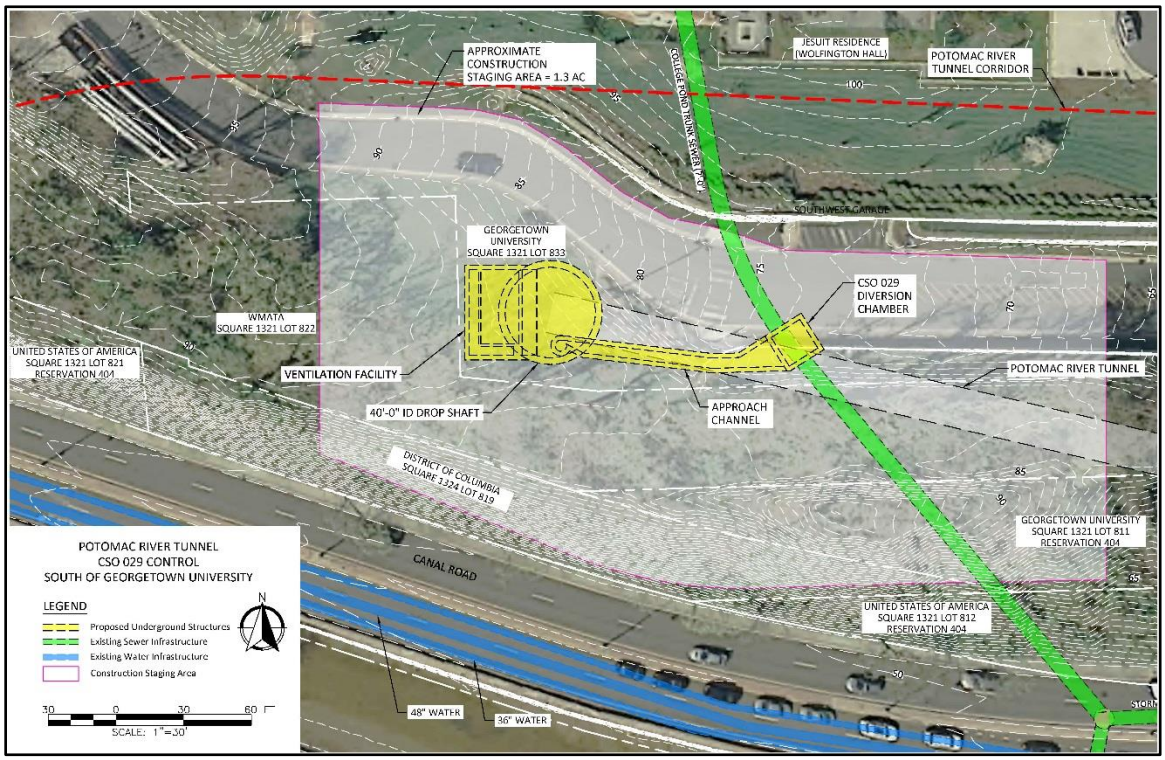

Figure 4-22: CSO 029 Control Option 2 – South of Georgetown University

4.2.12 COMPONENT 12 – TUNNEL CONNECTION TO EXISTING SHAFT AT JBAB

At its downstream end, the Potomac River Tunnel will be connected to the existing Blue Plains Tunnel, which would convey the flow to Blue Plains. The connection would be made via the existing drop shaft at JBAB, which has been designed to accommodate this connection (**Figure 4-23**). All work at this site would occur within the tunnel and existing drop shaft, except for potential ground improvement at the Potomac River Tunnel's interface with the drop shaft. The site would be restored substantially to existing conditions. All work at this site would be coordinated closely with JBAB.

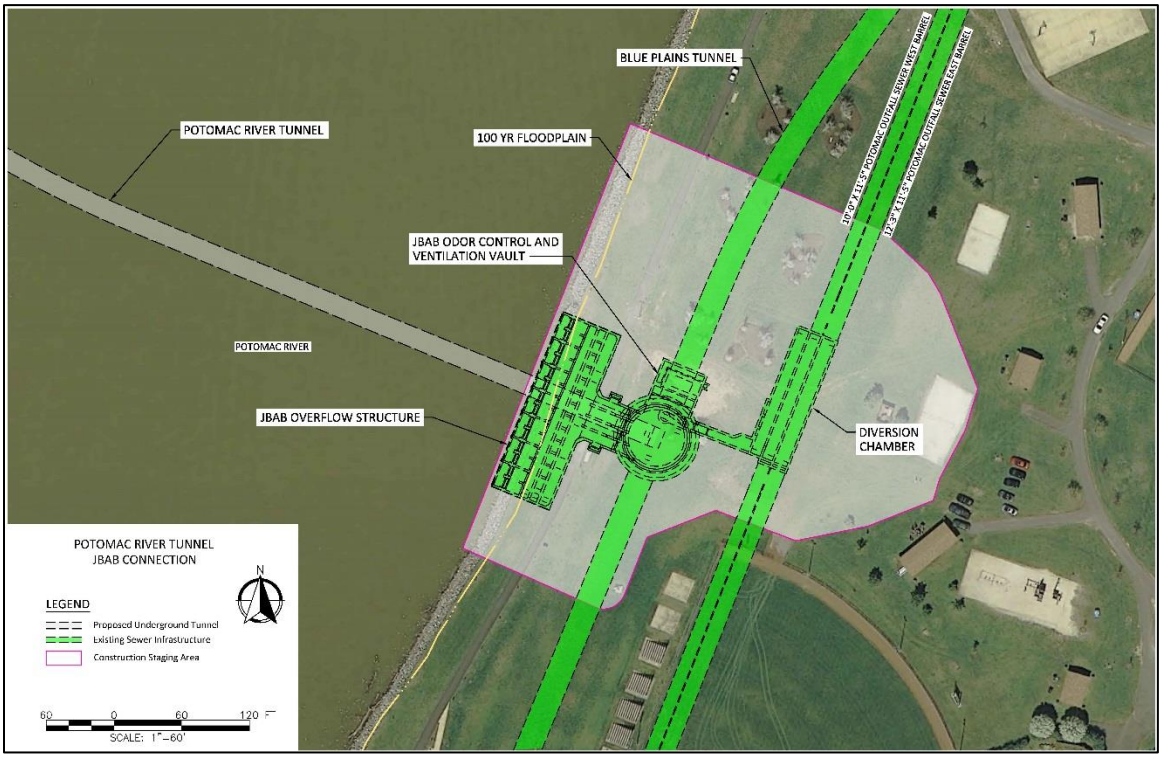

Figure 4-23: Tunnel Connection to Existing Shaft at JBAB

4.2.13 POTENTIAL GI PRACTICABILITY DETERMINATION OUTCOMES WITHIN THE PROPOSED ACTION

DC Water's Consent Decree was amended in 2016 to include the use of GI strategies to control CSOs with the intention of replacing portions of the proposed storage / conveyance tunnels and diversion facilities for the smaller, more upstream CSOs discharging to the Potomac River. Bioretention, downspout disconnection, and permeable pavement are examples of some of the types of low impact development facilities that would be constructed within the CSOs 027, 028, and 029 sewersheds. These facilities allow stormwater to flow through the surface layer of the facility to an underground storage layer, often composed of gravel. The facilities then temporarily store the runoff, slowing down the flow into the existing sewer system. Depending on soil conditions, the flow may infiltrate into the ground rather than flowing into the sewer system. **Figure 4-24** illustrates some examples of the GI practices that could be constructed within the Potomac River sewersheds.

To comply with the Consent Decree requirement to evaluate the practicability of GI, DC Water has initiated Green Infrastructure Project 1. This project will implement a portion of the required GI within the Potomac River GI sewersheds. DC Water will monitor and assess the outcome of Project 1 to determine the practicability of implementing the remainder of the required GI in these sewersheds. Green Infrastructure Project 1 is scheduled to be completed in 2019, with post-construction monitoring to conclude by 2020.

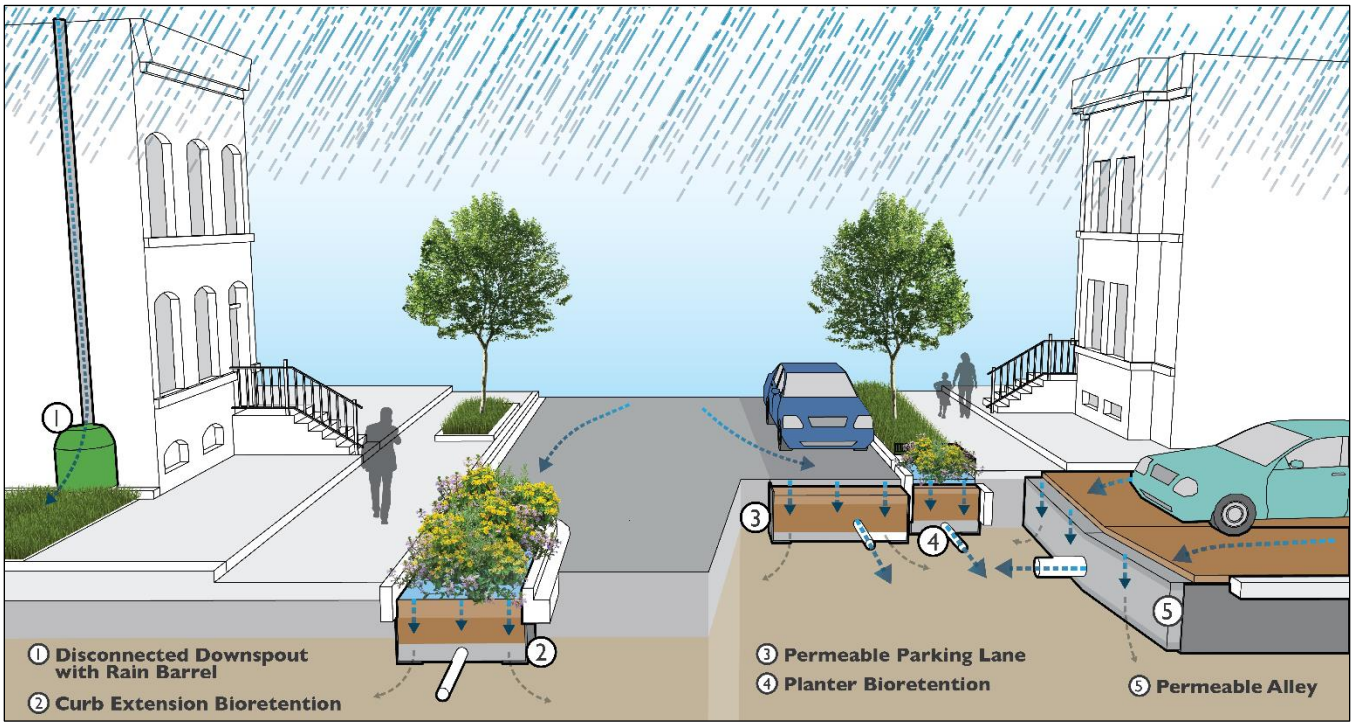

Figure 4-24: Graphic Illustration of Several Green Infrastructure Practices

Based on the outcome of the GI practicability determination, the western (upstream) terminus of the Potomac River Tunnel may vary. Four potential outcomes of the GI practicability determination are possible, which are summarized in **Table 4-2**. For each outcome, the Potomac River Tunnel would terminate at the most upstream CSO to be controlled by the tunnel.

Table 4-2: Possible Green / Gray Infrastructure Outcomes for the Proposed Action Alternative

Outcome	CSOs 020 - 024	CSO 027	CSO 028	CSO 029
A	Gray Infrastructure	Green Infrastructure	Green Infrastructure	Green Infrastructure
B	Gray Infrastructure	Gray Infrastructure	Green Infrastructure	Green Infrastructure
C	Gray Infrastructure	Gray Infrastructure	Gray Infrastructure	Green Infrastructure
D	Gray Infrastructure	Gray Infrastructure	Gray Infrastructure	Gray Infrastructure

Detailed facility siting and design have not been performed for the level of GI implementation required by the Amended Federal Consent Decree should GI be determined practicable. **Table 4-3** identifies the impervious acres of drainage area to be managed by GI after completion of GI Project 1. The type, configuration, and layout of GI facilities will be site specific and will be dependent on the results of the practicability assessment performed for GI Project 1.

Table 4-3: Impervious Area to be Controlled by GI per Amended Federal Consent Decree

Parameter Description	CSO 027	CSO 028	CSO 029
Total Sewershed Area	164 acres	21 acres	330 acres
Impervious Area to be Controlled by GI [(1)]	31 acres	4 acres	25 acres

[(1)] Area indicates remainder of impervious acres to be managed after completion of GI Project 1

5.0 IDENTIFICATION OF EFFECTS

5.1 CRITERIA OF ADVERSE EFFECT

Effects assessments are based on the criteria of adverse effect as defined in the National Historic Preservation Act (36 CFR § 800.5). The criteria of adverse effect are defined as follows:

> An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or cumulative [36 CFR 800.5(a)(1)].

Examples of adverse effects may include:

- physical destruction or damage;
- alterations that are inconsistent with the *Secretary's Standards for the Treatment of Historic Properties*, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access;
- removal of the property from its historic location; change of the character of the property's use or contributing physical features within the property's setting;
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- neglect or deterioration (except in certain religious or cultural cases); and,
- transfer, lease, or sale of property out of federal ownership or control without adequate preservation controls.

The following analysis is an assessment of the effects of the project on all National Register and DC Inventory eligible or listed historic properties and is based on the Section 106 criteria of effect. It should be noted that this report only addresses the adverse effects that would impact the integrity and/or significance of historic properties. Other impacts, such as construction-related traffic and noise, impacts to visitor/community use and experience, water quality, wetlands, and cumulative impacts, are analyzed and discussed in the EA being executed for the project under the NEPA regulations.

The determination of effect was based on conceptual project designs. Many assumptions regarding construction impacts, demolition, finishes, execution, and visual impacts have been made, including location, size, and number of features, demolition, and construction methods of the project, which have yet to be determined. It is therefore assumed that the entire Ground Level Construction Areas would be disturbed during construction, resulting in the temporary removal of all vegetation, circulation features, signage, benches, and any other existing features and amenities.

5.2 DETERMINATION OF ADVERSE EFFECT

5.2.1 POTENTIAL ADVERSE EFFECTS TO THE PROJECT AREA OF POTENTIAL EFFECT

Table 5-1 identifies historic properties that are located within the Project APE, as well as any direct and indirect, temporary and permanent, adverse effects that could potentially result from the construction of the tunnel approximately 75 – 125 feet underground. Vibrations from the TBM could impact resources within the zone of

influence, which would be established based on engineering evaluation of the final tunnel alignment and construction means and methods selected. The table also identifies potential indirect effects on surrounding historic properties that could be affected from permanent construction at the Ground Level Construction Areas. The direct adverse effects that could result from the Ground Level Construction Areas are addressed in *Section 5.2.2.* Potential adverse effects that could result from the implementation of GI are discussed in *Section 5.2.3.*

Table 5-1 is organized by resource as they are numbered in the corresponding APE map and historic properties table, **Figure 2-1** and **Table 2-1,** respectively. Included are the resources that could potentially be adversely affected, directly or indirectly, from the Potomac River Tunnel and its associated construction, temporary and permanent.

Table 5-1: Potential Adverse Effects to Historic Properties within the Project Area

Number	Historic Property	Alternative A (No-Action Alternative)	Alternative B (Construction of Potomac River Tunnel / Preferred Alternative)
N/A	The Plan of the City of Washington	No Adverse Effect	*Temporary:* There would be no temporary adverse effects. None of the avenues or streets of L'Enfant's Plan would be blocked or obscured during construction. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds throughout L'Enfant's Plan would be affected.
A	National Mall Historic District	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to buildings and other structures within the National Mall due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects.
B	East and West Potomac Parks Historic District	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to buildings and other structures within East and West Potomac Parks due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects.
C	Mount Vernon Memorial Highway	No Adverse Effect	*Temporary:* There would be no temporary adverse effect. *Permanent:* There would be no permanent adverse effects. *Indirect:* There could be indirect adverse effects to views or viewsheds throughout Mount Vernon Memorial Highway. The height of the emergency overflow structure under Options 1 or 2 has not yet been determined but it is likely the structure would be visible from Mount Vernon Memorial Highway.
D	George Washington Memorial Parkway	No Adverse Effect	*Temporary:* There would be no temporary adverse effect. *Permanent:* There would be no permanent adverse effects. *Indirect:* There could be indirect adverse effects to views or viewsheds throughout George Washington Memorial Highway. The height of the emergency overflow structure under Options 1 or 2 has not yet been determined but it is likely that the structure would be visible from George Washington Memorial Parkway. Emergency Overflow Structure Option 3 would also be visible from George Washington Memorial Parkway; however, the height of the structure would be limited to the existing seawall height, resulting in a negligible adverse effect. The proposed emergency surge relief pipe at CSO 027 Control Options 1 and 2 would be visible from George Washington Memorial Highway; however, the 10-foot pipe would blend in with the other existing outfalls along the river in Georgetown and would have a negligible adverse effect on the resource. The proposed construction from CSO 028 Control would not be visible from the Parkway across the river due to the tree line along the Potomac River.
E	Arlington National Cemetery Historic District	No Adverse Effect	*Temporary:* There would be no temporary adverse effect. *Permanent:* There would be no permanent adverse effects. *Indirect:* There could be indirect adverse effects to views or viewsheds throughout Arlington National Cemetery Historic District. The height of the emergency overflow structure under Options 1 or 2 has not yet been determined but it is likely that the structure would be visible from the historic district.

Number	Historic Property	Alternative A (No-Action Alternative)	Alternative B (Construction of Potomac River Tunnel / Preferred Alternative)
F	Rock Creek and Potomac Parkway Historic District	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to buildings and other structures within Rock Creek and Potomac Parkway due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. During construction of Emergency Overflow Structure Option 3 or CSO 022 Control Option 1, this section of the resource would temporarily be closed, and the Rock Creek Park Trail would be rerouted, resulting in a temporary adverse effect; however, the trail and park would be reopened after construction was completed. Effects to visitor use is discussed in the EA. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects.
G	Observatory Hill Historic District	No Adverse Effect	*Temporary*: There would be no temporary adverse effects. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as the permanent features from CSO 020 Control Options 1 and 2 would not be visible from the resource.
H	Theodore Roosevelt Island National	No Adverse Effect	*Temporary*: There would be no temporary adverse effects. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be potential indirect visual effects to Roosevelt Island from Emergency Overflow Structure Option 3. The structure would be visible from the northeast corner of the island; however, due to the current height of the seawall at the location of construction, the overflow structure would be below the current seawall, resulting in a negligible adverse effect. Additionally, permanent construction resulting from CSO 022 Control Option 1 would not be visible from Roosevelt Island due to the distance across the Potomac River and the limited height of the permanent features.
I	Foggy Bottom Historic District	No Adverse Effect	*Temporary*: There would be no temporary adverse effects. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be indirect visual effects due to the construction of the ventilation control facility; however, the design would be executed in consultation with NPS and DC SHPO to minimize those adverse effects.
J	Georgetown National Historic Landmark District	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to buildings and other structures within the Georgetown National Historic Landmark District due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. Temporary construction-related effects would result from Components 6 through 11; traffic, noise, and visitor usage are discussed within the EA. Once construction is completed, the sites in Georgetown would be returned to their original functions and configurations. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects.
K	C&O Canal NHP	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to buildings and other structures within C&O Canal NHP due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects.
L	The Potomac Gorge	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to buildings and other structures within the Potomac Gorge due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects.
1	Lady Bird Johnson Park	No Adverse Effect	*Temporary:* There would be no temporary adverse effect. *Permanent:* There would be no permanent adverse effects. *Indirect:* There could be indirect adverse effects to views or viewsheds throughout Lady Bird Johnson Park. The height of the emergency overflow structure under Options 1 or 2 has not yet been determined but it is likely that the structure would be visible from Lady Bird Johnson Park.

Number	Historic Property	Alternative A (No-Action Alternative)	Alternative B (Construction of Potomac River Tunnel / Preferred Alternative)
2	Cuban Friendship Urn	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to the Cuban Friendship Urn due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects.
3	Thomas Jefferson Memorial	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to the Jefferson Memorial due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects. None of the ground level construction areas are visible from the Jefferson Memorial.
4	Franklin Delano Roosevelt Memorial	No Adverse Effect	*Temporary*: There could be temporary adverse effects to the Franklin Delano Roosevelt Memorial due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects. None of the ground level construction areas are visible from the Roosevelt Memorial.
5	Martin Luther King, Jr. Memorial	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to the Martin Luther King, Jr. Memorial due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects. Permanent construction form Tunnel Mining Site Option 1 would not be visible from the memorial. The visitor center located at Independence Drive SW and West Basin Drive SW, as well as tall trees located at that intersection, screen the memorial from the ballfields of West Potomac Park.
6	Auditor's Complex (Bureau of Engraving and Printing)	No Adverse Effect	*Temporary*: There would be no temporary adverse effects. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effect to the historic property as all work executed for the extension of high voltage electricity distribution lines would be limited to roadways.
7	Korean War Veterans Memorial	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to the Korean War Veterans Memorial due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects. Permanent construction form Tunnel Mining Site Option 1 would not be visible from the memorial. The heavy tree canopy in and surrounding the memorial block all views from the memorial to Independence Avenue SW and beyond.
8	Arlington Memorial Bridge	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to Arlington Memorial Bridge due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There could be indirect adverse effects to views or viewsheds to and from Arlington Memorial Bridge. The height of the emergency overflow structure under Options 1 or 2 has not yet been determined but it is likely that the structure would be visible from the bridge.

Number	Historic Property	Alternative A (No-Action Alternative)	Alternative B (Construction of Potomac River Tunnel / Preferred Alternative)
9	Lincoln Memorial	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to the Lincoln Memorial due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from the Lincoln Memorial would be affected. The permanent structures proposed in CSO 020 Control Options 1 and 2 would be limited and due to the topography of the land, would not be visible from the Lincoln Memorial. Furthermore, CSO 020 Control Option 1 is west of the critical viewshed from the Lincoln Memorial up 23rd Street NW and features would be situated as far west as practicable, away from the National Mall.
10	John F. Kennedy Center for the Performing Arts	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to the Kennedy Center due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from the Kennedy Center would be affected. The height of Emergency Overflow Structure Option 3 would be limited and would not rise above the extant seawall. There would also be no visual effects from permanent construction of CSO 022 Control Option 1 as the features would be designed specifically for the site to blend in with the surroundings.
11	Watergate Complex	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to Watergate due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* The height of the Emergency Overflow Structure Option 3 would be limited and would not rise above the extant seawall height. There would also be no visual effects from permanent construction of CSO Control 022 Option 1. The limited height would not adversely affect views from the resource. Also, there would be negligible, indirect visual effects due to the construction of the one-to-two story ventilation control facility; however, the design would be executed in consultation with NPS and DC SHPO to minimize those adverse effects.
12	Francis Scott Key Bridge	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to Francis Scott Key Bridge due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as the permanent features from CSO 027 Control Options 1 and 2 as the permanent features would be designed to blend in with Georgetown Waterfront Park. Permanent features at the CSO 029 Control would not be visible from Francis Scott Key Bridge as it would be behind extant buildings. The proposed construction from CSO 028 Control would not be visible from the bridge due to the tree line along the Potomac River as well as the existing Potomac (Alexandria) Aqueduct Abutment and Pier.
13	Dodge Warehouses	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to the Dodge Warehouses due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from the Dodge Warehouses would be affected. The height of CSO 027 Control Options 1 and 2 would be limited and would not be visible from the Dodge Warehouses. Furthermore, the features would be designed so as to blend in with the character of Georgetown Waterfront Park and would not interrupt views from the resource to the waterfront.

Number	Historic Property	Alternative A (No-Action Alternative)	Alternative B (Construction of Potomac River Tunnel / Preferred Alternative)
14	Brickyard Houses	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to the Brickyard Houses due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from the Brickyard Houses would be affected.
15	Grace Church (Grace Protestant Episcopal Church)	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to Grace Church due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from the Grace Church would be affected.
16	Duvall Foundry	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to Duvall Foundry due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from Duvall Foundry would be adversely affected. Permanent construction at the CSO 024 Control would be limited in height and would be placed within the public right-of way of K Street NW, not effecting the views from Duvall Foundry to the waterfront.
17	West Heating Plant	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to West Heating Plant due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from West Heating Plant would be adversely affected. Permanent construction at the CSO 024 Control would be limited in height and would be placed within the public right-of way of K Street NW, not effecting the views from West Heating Plant to the waterfront.
18	Henry McCleery House	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects the Henry McCleery House due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from Henry McCleery House would be adversely affected. Permanent construction at the CSO 024 Control would be limited in height and would be placed within the public right-of way of K Street NW, not effecting the views from West Heating Plant to the waterfront.
19	DC Paper Manufacturing Company	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to the DC Paper Manufacturing Company due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from the DC Paper Manufacturing Company would be affected. The height of CSO 027 Control Options 1 and 2 would be limited and would not be visible from the DC Paper Manufacturing Company. Furthermore, the features would be designed to blend in with the character of Georgetown Waterfront Park and would not interrupt views from the resource to the waterfront.

Number	Historic Property	Alternative A (No-Action Alternative)	Alternative B (Construction of Potomac River Tunnel / Preferred Alternative)
20	Bomford Mill	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to Bomford Mill due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from Bomford Mill would be affected. The height of CSO 027 Control Options 1 and 2 would be limited and would not be visible from Bomford Mill. Furthermore, the features would be designed to blend in with the character of Georgetown Waterfront Park and would not interrupt views from the resource to the waterfront.
21	Potomac Boat Club	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to Potomac Boat Club due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from Potomac Boat Club would be affected. Permanent features from the CSO 028 Control would be blocked from the Potomac Boat Club by the Potomac (Alexandria) Aqueduct Abutment and Pier.
22	Potomac (Alexandria) Aqueduct Abutment and Pier	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to the Potomac (Alexandria) Aqueduct Abutment and Pier due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. Access to Potomac (Alexandria) Aqueduct Abutment and Pier may be rerouted, resulting in a temporary adverse effect, during the construction of the CSO 028 Control, but would be returned once construction was completed. *Permanent:* There would be no permanent adverse effects. *Indirect:* Permanent features from the CSO 028 Control would be visible from the Potomac (Alexandria) Aqueduct Abutment and Pier resulting in a potential, indirect adverse effect; however, the features would be designed in consultation with NPS to blend in to the surroundings.
23	Washington Canoe Club	No Adverse Effect	*Temporary*: Pending final tunnel alignment selection, there could be temporary adverse effects to the Washington Canoe Club due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. Access to Washington Canoe Club may be rerouted, resulting in a temporary adverse effect, during the construction of the CSO 028 Control, but would be returned once construction was completed. *Permanent:* There would be no permanent adverse effects. *Indirect:* Permanent features from the CSO 028 Control would be visible from the Washington Canoe Club resulting in a potential, indirect adverse effect; however, the features would be designed in consultation with NPS to blend in to the surroundings.
24	Wisconsin Avenue Bridge (High Street Bridge)	No Adverse Effect	*Temporary:* Pending final tunnel alignment selection, there could be temporary adverse effects to the Wisconsin Avenue Bridge due to vibrations from tunnel boring and hauling activities. For resources within the tunnel vibration zone of influence, DC Water would implement a thorough monitoring plan, including structural protections, as needed, for historic structures along the tunnel alignment, and would identify other construction means and methods to minimize the potential effects of vibration. *Permanent:* There would be no permanent adverse effects. *Indirect:* There would be no indirect adverse effects as no views or viewsheds to or from the Wisconsin Avenue Bridge would be affected.

Archeological Resources

The Potomac River Tunnel would be located between 75 and 125 feet below the current land surface, well below levels of human occupation. Construction of the tunnel at these depths has no potential to encounter archaeological resources. However, DC Water may perform ground improvements outside of the Ground Level Construction Areas where necessary to facilitate TBM maintenance or mitigate the potential for impacts to existing utilities or other structures due to ground subsidence during tunnel excavation. DC Water would perform archaeological assessment and survey of all

areas where ground improvements outside of defined construction areas would occur, conduct National Register evaluation of any resources encountered, and avoid, minimize or mitigate adverse effects to archaeological resources found to be eligible for listing in the National Register or DC Inventory.

5.2.2 POTENTIAL ADVERSE EFFECTS TO THE GROUND LEVEL CONSTRUCTION AREAS

The following determination of effect describes effects from the ground level construction of supporting infrastructure for the Potomac River Tunnel. This section addresses temporary and permanent direct effects to the historic properties outlined in *Section 2.3* and the character-defining features described in *Section 3.2*. This section does not discuss indirect adverse effects the project would have on other surrounding historic properties; those were discussed in *Section 5.2.1*.

As mentioned in *Section 5.1*, the following analysis is an assessment of the effects of the project on all National Register or DC Inventory eligible or listed historic properties and is based on the Section 106 criteria of effect. It should be noted that this report only addresses the adverse effects that would impact the integrity and/or significance of historic properties. Other impacts, such as construction-related traffic and noise, impacts to visitor/community use and experience, water quality, wetlands, and cumulative impacts are analyzed and discussed in the EA being prepared for the project per NEPA regulations.

The determination of effect was based on conceptual project designs. Many assumptions regarding construction impacts, demolition, finishes, execution, and visual impacts have been made, including location, size, and number of features, demolition, and construction methods of the project, which have yet to be determined. It is therefore assumed that the entire Ground Level Construction Areas would be disturbed during construction, resulting in the temporary removal of all vegetation, circulation features, signage, benches, and any other existing features and amenities.

This section is organized by alternative, component, and option (when applicable).

Under *Alternative A (No-Action)*, no effects, direct or indirect, would occur to any historic properties within the project area; therefore, there would be no adverse effects.

5.2.2.1 Component 2: Tunnel Mining Site

Under *Alternative B (Preferred Alternative)* a tunnel mining site would be required during construction. There are two site options proposed under *Alternative B*.

5.2.2.1.1 Tunnel Mining Site Option 1 – West Potomac Park (North)

Most of the construction associated with the Tunnel Mining Site Option at West Potomac Park (North) would be temporary. This section of the park would be closed temporarily during construction displacing the two softball fields and the open recreational space on the site resulting in a temporary adverse effect. The trees along Ohio Drive SW and the gravel drive would be removed to clear the construction site resulting in a temporary adverse effect. DC Water would coordinate with NPS to reestablish park functions and facilities following construction. There would be no adverse effects, temporary or permanent, direct or indirect, to any historic properties as a result of installing high voltage electricity distribution lines from 14th Street SW, along Independence Avenue SW, or Ohio Drive SW and East Basin Drive SW, as all work would take place within the roadway except in the immediate vicinity of the mining site and connection to existing infrastructure.

Permanent features that would be visible following construction include approximately five to seven at-grade manholes, three to four access hatches, and other access points to underground structures. Due to the site's location within the 100-year floodplain, several elements would be elevated approximately five feet above grade, including an

electrical cabinet for the ventilation equipment, tunnel ventilation grating, and an access point to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to minimize adverse effects and incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or as multiple smaller structures to reduce the visual intrusion. Finish materials such as stone or brick could be used as treatments on above-grade structures to be more compatible with the surrounding architecture. Depending on surrounding land use, the site could also be graded with a gentle slope to the top of a structure to create a mound that would integrate the DC Water structure into the landscape and soften the appearance. Alternatively, visible structures could be placed adjacent to existing facilities or concealed with shrubs or other vegetation. DC Water would coordinate closely with NPS, DC SHPO, and others, as appropriate, to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

Temporary adverse effects would occur to historic properties under the Tunnel Mining Site Option at West Potomac Park (North). Trees that are removed would be replaced in kind or with native species at a ratio coordinated with the NPS, to minimize the adverse effect. The closure of the site to public use would also be temporary and the section of the park would reopen once construction was completed, with the same function. These temporary adverse effects would be mitigated and eliminated after construction was completed.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points would be placed as inconspicuously as possible within the site and would be designed in consultation with NPS, DC SHPO, and others to be appropriate with materials and details that would have minimal adverse effects on the park. The permanent construction would have no adverse effect to the softball fields, which would be reestablished following construction, the location's function as a public recreational space, or the larger National Mall and East and West Potomac Parks Historic Districts, within which West Potomac Park is located. Furthermore, as the facilities would be designed to have minimal impact on the surrounding West Potomac Park and National Mall, they would be located to not have an adverse effect on any views from the resource. This includes views north to the Lincoln Memorial, northeast to the Memorial Bridge, views east to the Washington Monument, views west and south to the Potomac River, and views southeast, to the open expanse of the rest of the softball fields at this location.

Archaeological Resources

Archaeological investigations within the Tunnel Mining Site Option at West Potomac Park (North) found limited archaeological resources related to the temporary World War II structures and no intact surfaces at the locations of the tunnel mining site or along the possible routes for the extension of high voltage electricity distribution lines within Ohio Drive SW and East Basin Drive SW. These resources are not eligible for listing in the National Register (Kreisa et al. 2018). This area has also been found to have no potential for deeply buried, late Pleistocene-early Holocene dated archaeological deposits (Wagner 2018).

Phase IB survey is recommended prior to the extension of high voltage electricity distribution lines along Independence Avenue SW to deliver power to the tunnel mining site should final plans include disturbance outside the roadway between 14th Street SW and Maine Avenue SW except in the immediate vicinity of the mining site and connection to existing infrastructure.

5.2.2.1.2 Tunnel Mining Site Option 2 – West Potomac Park (South)

A majority of the construction associated with the Tunnel Mining Site Option at West Potomac Park (South) would be temporary. This section of the park would be closed temporarily during construction displacing the three softball fields and the open recreational space on the site, resulting in a temporary adverse effect. The trees along Ohio Drive SW would be removed to clear the construction site also resulting in a temporary adverse effect. DC Water would coordinate with NPS to reestablish park functions and facilities following construction. There would be no adverse

effects, temporary or permanent, direct or indirect, to any historic properties from the extension of high voltage electricity distribution lines from 14th Street SW, along Ohio Drive SW and East Basin Drive SW, as all work would take place within the roadway.

Permanent features that would be visible following construction include approximately five to seven at-grade manholes, three to four access hatches, and other access points to underground structures. Due to the site's location within the 100-year floodplain, several elements would be elevated approximately five feet above grade, including an electrical cabinet for the ventilation equipment, tunnel ventilation grating, and an access point to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to minimize adverse effects and incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or as multiple smaller structures to reduce the visual intrusion. Finish materials such as stone or brick could be used as treatments on above-grade structures to be more compatible with the surrounding architecture. Depending on surrounding land use, the site could also be graded with a gentle slope to the top of a structure to create a mound that would integrate the DC Water structures into the landscape and soften the appearance. Alternatively, visible structures could be placed adjacent to existing facilities or concealed with shrubs or other vegetation. DC Water would coordinate closely with NPS, DC SHPO, and others, as appropriate, to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

Temporary adverse effects would occur to historic properties under the Tunnel Mining Site Option at West Potomac Park (South). Trees that are removed would be replaced in kind or with native species at a ratio coordinated with the NPS, to minimize the adverse effect. The closure of the site to public use would also be temporary and the section of the park would reopen once construction was completed, with the same function. These temporary adverse effects would be mitigated and eliminated after construction was completed.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points would be placed as inconspicuously as possible within the site and would be designed in consultation with NPS, DC SHPO, and others to be appropriate with materials and details that would have minimal adverse effects on the park. The permanent construction would have no adverse effect to the softball fields, which would be reestablished following construction, the location's function as a public recreational space, or the larger National Mall and East and West Potomac Parks Historic Districts within which West Potomac Park is located. Furthermore, as the facilities would be designed and situated to have minimal impact on the surrounding West Potomac Park and National Mall; they would be located to not have an adverse effect on any views from the resource to other historic sites, including views north to the Washington Monument, views west and south to the Potomac River and Memorial Bridge, and southeast, to the open expanse of the rest of the softball fields at this location.

Archaeological Resources

Archaeological investigations within the Tunnel Mining Site Option at West Potomac Park (South) found limited archaeological resources related to the temporary World War II structures and no intact surfaces at the locations of the tunnel mining site or along the route to extend high voltage electricity distribution lines within Ohio Avenue SW and East Basin Drive SW. These resources are recommended to be not eligible for listing in the National Register (Kreisa et al. 2018). This area has also been found to have no potential for deeply buried, late Pleistocene-early Holocene dated archaeological deposits (Wagner 2018).

5.2.2.2 Component 3 – Emergency Overflow Structure

Under *Alternative B (Preferred Alternative)* an emergency overflow structure would be required to protect the tunnel and upstream infrastructure during rain events which exceed the system's capacity or occur when the system is already full. There are three site options proposed under *Alternative B.*

5.2.2.2.1 Emergency Overflow Structure Option 1– West Potomac Park (North)

Most of the construction associated with Emergency Overflow Structure Option 1 would be temporary and would extend from West Potomac Park into the Potomac River. This section of West Potomac Park would be temporarily closed and Ohio Drive SW and Rock Creek Park Trail, which run through the site, would be temporarily relocated to allow for traffic circulation around the construction site. For further discussion of impacts due to traffic and visitor use, reference the Potomac River Tunnel EA, but there would be no adverse effects to Independence Avenue SW, as the current configuration is not a character-defining feature, and would be restored once construction was completed. All the trees on the site, including those along Independence Avenue SW, would be removed during the construction process. This includes approximately 20 flowering cherry trees that line the Potomac River within the site, which would result in an adverse effect to the National Mall and East and West Potomac Parks Historic Districts; however, once construction was completed, trees would be replaced in kind or at a ratio coordinated with NPS in accordance with an approved planting plan. Following construction, DC Water would coordinate with NPS to reestablish Ohio Drive SW and Rock Creek Park Trail, and other park functions and facilities.

Permanent features that would be visible following construction include numerous at-grade manholes, access hatches, and other access points to underground structures. At-grade features would be placed within Ohio Drive SW to the extent practicable, causing a negligible adverse effect on the resource, but minimizing effects to the surrounding landscape. Due to the site's location within the 100-year floodplain, several elements would need to be elevated approximately five feet above grade, including an electrical cabinet for the ventilation equipment, tunnel ventilation grating, and an access point to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or as multiple smaller structures to reduce the visual intrusion. Finish materials such as stone or brick could be used as treatments on above-grade structures, or the site could be graded with a gentle slope to the top of a structure to create a mound that would soften the appearance. Alternatively, visible structures could be placed adjacent to existing facilities or concealed with shrubs or other vegetation. DC Water would coordinate closely with NPS, DC SHPO, and others as appropriate to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

The emergency overflow structure would be constructed along the riverfront and would be composed of poured concrete with large rectangular openings that would partially protrude above the water line. A section of the historic seawall would be demolished to accommodate the overflow structure and would result in an adverse effect. The exact height of the overflow structure has yet to be determined, but it would be visible from across the Potomac River from George Washington Memorial Parkway/Mount Vernon Memorial Highway, Arlington Memorial Bridge, Arlington National Cemetery, and Lady Bird Johnson Park; potential, indirect adverse effects to those resources are discussed in *Section 5.2.1*. However, the emergency overflow structure would be located to not effect views within West Potomac Park itself as the park setting would be reestablished on top of the structure. To the extent possible, as previously mentioned, trees and other vegetation removed for construction would be replaced, minimizing the adverse effect.

Temporary adverse effects would occur to historic properties under the Emergency Overflow Structures Option at West Potomac Park (North). Trees that are removed would be replaced in kind or at a ratio coordinated with NPS in accordance with an approved planting plan, resulting in a temporary adverse effect. The closure of the site to public use would also be temporary and the section of the park would reopen once construction was completed, with the same function. Ohio Drive SW and Rock Creek Park Trail would be rerouted during construction but would be reestablished after work was completed.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points would be placed as inconspicuously as possible within the site and would be designed in consultation with NPS, DC SHPO, and others, to

be appropriate with materials and details that would have negligible adverse effects on the park. The permanent construction would have no adverse effect to the softball fields which would be reestablished following construction, the location's function as a public recreational space, or the larger National Mall and East and West Potomac Parks Historic Districts within which West Potomac Park is located. The emergency overflow structure would cause an adverse effect with the loss of portions of the historic seawall, but the structure would not block views to the river. Furthermore, as the facilities would be designed and situated to have minimal impact on the surrounding West Potomac Park and National Mall, they would be located to not have an adverse effect on any views from the resource to other historic sites, including views north to the Memorial Bridge, views north, west, and south to the Potomac River and the Virginia shoreline beyond, and southeast, along the shoreline of the Potomac River.

Archaeological Resources

See *Section 5.2.2.1.1* and *Section 5.2.2.1.2* for the assessment of effects to archeological resources associated with the potential tunnel mining site locations within West Potomac Park. In addition, as the emergency overflow structure would extend into the Potomac River, Kreisa et al. (2018) assessed the construction area for the potential for submerged archaeological resources. This assessment indicated that the area within the Potomac River adjacent to West Potomac Park Options 1 and 2 is in an area that was not historically within the main channel of the Potomac River. In addition, a review of geotechnical borings determined that this area has no potential for deeply buried, late Pleistocene-early Holocene dated archaeological deposits (Wagner 2018).

5.2.2.2.2 Emergency Overflow Structure 2 – West Potomac Park (South)

Most of the construction associated with Emergency Overflow Structure Option 2 would be temporary and would extend from West Potomac Park into the Potomac River. This section of West Potomac Park would be temporarily closed and Ohio Drive SW and Rock Creek Park Trail, which run through the site, would be temporarily relocated to allow for traffic circulation around the construction site. For further discussion of impacts due to traffic and visitor use, reference the Potomac River Tunnel EA. All the trees on the site would be removed during the construction process, including approximately six flowering cherry trees that line the river within the site. This would result in an adverse effect to the historic districts; however, once construction was completed, trees would be replaced in kind. Following construction, DC Water would coordinate with NPS to reestablish Ohio Drive SW and Rock Creek Park Trail, and other park functions and facilities.

Permanent features that would be visible following construction include numerous at-grade manholes, access hatches, and other access points to underground structures. At-grade features would be placed within Ohio Drive SW to the extent practicable, causing a negligible adverse effect on the resource, but minimizing effects to the surrounding landscape. Due to the site's location within the 100-year floodplain, several elements would need to be elevated approximately five feet above grade, including an electrical cabinet for the ventilation equipment, tunnel ventilation grating, and an access point to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or as multiple smaller structures to reduce the visual intrusion. Finish materials such as stone or brick could be used as treatments on above-grade structures, or the site could be graded with a gentle slope to the top of a structure to create a mound that would soften the appearance. Alternatively, visible structures could be placed adjacent to existing facilities or concealed with shrubs or other vegetation. DC Water would coordinate closely with NPS, DC SHPO, and others to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

The emergency overflow structure would be constructed along the riverfront and would be composed of poured concrete with large rectangular openings that would partially protrude above the water line. A section of the historic seawall would be demolished to accommodate the overflow structure and would result in an adverse effect. The exact

height of the overflow structure openings has yet to be determined, but they would be visible from across the Potomac River from George Washington Memorial Parkway/Mount Vernon Memorial Highway, Arlington Memorial Bridge, Arlington National Cemetery, and Lady Bird Johnson Park; potential, indirect adverse effects to those resources are discussed in *Section 5.2.1*. However, the emergency overflow structure would not affect views within West Potomac Park itself as the park setting would be reestablished on top of the structure. To the extent practicable, trees and other vegetation removed for construction would be replaced, minimizing the adverse effect.

Temporary adverse effects would occur to the historic properties under the Emergency Overflow Structures Option at West Potomac Park (South). Trees that are removed would be replaced in kind with an approved planting plan coordinated with NPS, resulting in a temporary adverse effect. The closure of the site to public use would also be temporary and the section of the park would reopen once construction was completed, with the same function. Ohio Drive SW and Rock Creek Park Trail would be rerouted during construction but would be reestablished after work was completed.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points would be placed as inconspicuously as possible within the site and would be designed in consultation with NPS, DC SHPO, and others to be appropriate with materials and details that would have negligible adverse effects on the park. The permanent construction would have no adverse effect to the softball fields which would be reestablished following construction, the location's function as a public recreational space, or the larger National Mall and East and West Potomac Parks Historic Districts within which West Potomac Park is located. The emergency overflow structure would cause an adverse effect with the loss of portions of the historic seawall, but the structure would not block views to the river. Furthermore, as the facilities would be designed and situated to have minimal impact on the surrounding West Potomac Park and National Mall; they would be located to not have an adverse effect on any views from the resource to other historic sites, including views north to the Memorial Bridge, and views north, west, and south to the Potomac River and the Virginia shoreline beyond.

Archaeological Resources

See *Section 5.2.2.2.1* for the assessment of effects to archaeological resources associated with Emergency Overflow Structure Option 2.

5.2.2.2.3 Emergency Overflow Structure 3 – CSO 022

Most of the construction associated with Emergency Overflow Structure Option 3 at CSO 022 would be temporary and would extend from Rock Creek and Potomac Parkway Historic District into the Potomac River. This section of Rock Creek and Potomac Parkway, along with the Rock Creek Park Trail, would be closed during the construction of the emergency overflow structure resulting in a temporary adverse effect. In coordination with NPS, Rock Creek Park Trail would be rerouted during construction, but reestablished with the same configuration and materials of the existing trail, resulting in a temporary adverse effect. The trees along the Potomac River and Rock Creek within the construction area would be removed resulting in an adverse effect but would be replaced in kind or with a native species at a ratio coordinated with NPS to minimize the adverse effect.

Permanent features that would be visible following construction include numerous at-grade manholes, access hatches, and other access points to underground structures. Due to the site's location within the 100-year floodplain, several elements would be elevated approximately three to five feet above grade, including an electrical cabinet for the ventilation equipment, tunnel ventilation grating, and access points to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to minimize adverse effects and incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or as multiple smaller structures to reduce the visual intrusion. Finish materials such as stone or brick could be used as treatments on above-

grade structures to be more compatible with the surrounding architecture. The site could also be graded with a gentle slope to the top of a structure to create a mound that would integrate the DC Water structures into the landscape and soften the appearance. Alternatively, visible structures could be placed adjacent to existing facilities or concealed with shrubs or other vegetation. DC Water would coordinate closely with NPS, DC SHPO, and others to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

The emergency overflow structure would be constructed along the riverfront and would be composed of poured concrete with large rectangular openings that would partially protrude above the water line. A section of the historic seawall would be demolished to accommodate the overflow structure; however, the historic seawall in this area has already been severely altered with the addition of a contemporary, poured concrete seawall on top. The exact height of the overflow structure has yet to be determined, but it would not be higher than the extant seawall in this location. The emergency overflow structure would be visible from across the Potomac River from the Theodore Roosevelt Island; potential, indirect adverse effects to those resources are discussed in *Section 5.2.1*. The emergency overflow structure would not affect views within Rock Creek and Potomac Parkway itself as the park setting would be reestablished on top of the structure and the highest of the structure would not surpass the extant height of the seawall. To the extent practicable, trees and other vegetation removed for construction would be replaced, minimizing the adverse effect.

Temporary adverse effects would occur to historic properties under the Emergency Overflow Structure Option at CSO 022. Trees that are removed would be replaced in kind or at a ratio in accordance with an approved planting plan coordinated with NPS, resulting in a temporary adverse effect. The closure of the site to public use would also be temporary and the section of the park would reopen once construction was completed, with the same function. Rock Creek Park Trail would be rerouted during construction, but reestablished after work was completed, causing a temporary adverse effect.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points required for the CSO 022 diversion facility would be placed as inconspicuously as possible within the site and would be designed in consultation with NPS, DC SHPO, and others to be appropriate with materials and details that would have negligible adverse effects on the park. The emergency overflow structure would cause an adverse effect with the loss of portions of the historic seawall, but the structure would not block views to the river. Furthermore, as the facilities would be designed and situated to have minimal impact on the surrounding Rock Creek and Potomac Parkway; they would not have an adverse effect on any views from the resource to other historic properties, including views north to Rock Creek, views east and south to the Watergate Complex, views south to the Kennedy Center, and views west and south to the Potomac River, Theodore Roosevelt Island, and the Georgetown Waterfront.

Archaeological Resources

A geoarchaeological survey of the area encountered building material near the mapped locations of structures associated with Washington Gas Light Company that minimally date from 1887 to 1915 (Kreisa et al. 2018). An assessment of the area also indicated that docks, wharves, and bulkheads dating to the nineteenth century may be present, now buried beneath fill deposits. As further investigation is required to determine the presence and potential significance of archeological resources at the site, DC Water would perform archaeological evaluations of all known (inclusive of historically-mapped locations) resources within the Emergency Overflow Structure Option 2 construction area, National Register evaluations of previously identified and any additional resources encountered, and minimize or mitigate adverse effects to archaeological resources found to be eligible for listing in the National Register.

In addition, as the emergency overflow structure would extend into the Potomac River, Kreisa et al. (2018) assessed the construction area for the potential for submerged archaeological resources. The assessment indicated that the uppermost 10 to 15 feet of the river bottom was subjected to dredging. As such, there appears to be little potential for submerged archaeological resources and no additional investigations are recommended. In addition, a review of

geotechnical borings determined that this area has no potential for deeply buried, late Pleistocene-early Holocene dated archaeological deposits (Wagner 2018).

5.2.2.3 Component 4 – Ventilation Control Facility and UPIRS Diversion Structure

Under *Alternative B (Preferred Alternative),* a ventilation control facility and diversion structure would be constructed to mitigate air releases from the tunnel system and provide relief for the existing UPIRS. Construction of the ventilation control facility and UPIRS diversion structure would be limited to the parcels of land directly south of the on-ramp to the Whitehurst Freeway NW, partially within the bounds of Rock Creek and Potomac Parkway, and within the Plan of the City of Washington. The construction would cause a temporary adverse effect. All the trees on the site would be removed for construction.

Permanent construction would result in an above ground ventilation control facility that would be approximately one – to – two stories in height and would be designed in consultation with NPS, DC SHPO, NCPC, and the Commission of Fine Arts (CFA) to ensure that the materials and design details are compatible with Rock Creek and Potomac Parkway to minimize the adverse effects. The facility would not interrupt the street grid, and therefore, would not have an adverse effect on the Plan of the City of Washington. Indirect effects from the addition of a new structure on other surrounding historic properties are discussed in *Section 5.2.1*.

Archaeological Resources

Previous investigations of a portion of the ventilation control facility and UPIRS diversion structure construction area have resulted in the identification of archaeological site 51NW120, the Lime Kiln site. Other portions of the construction area, outside of the archaeological site boundaries both east and west of 27th Street NW, have not been surveyed for the presence of archaeological resources. Assessment of the areas not yet surveyed indicates that there remains a high potential for the presence of mid- to late-nineteenth century archaeological resources (Kreisa et al. 2018). As further investigation is required to determine the presence and potential significance of archeological resources at the site, DC Water would investigate all areas not yet surveyed within the construction area, conduct National Register evaluations of 51NW120 and any additional resources encountered and minimize or mitigate adverse effects to archaeological resources found to be eligible for listing in the National Register.

5.2.2.4 Component 5 – CSO 020 Control

Under *Alternative B (Preferred Alternative)* underground structures would be constructed to divert overflow from the existing CSO 020 outfall to the tunnel. There are two options being considered under *Alternative B.*

5.2.2.4.1 CSO 020 Control Option 1 – 23rd St NW/Constitution Ave NW

A majority of the construction associated with the CSO 020 Control Option at 23rd Street NW and Constitution Avenue NW would be temporary. The ground level construction area falls within West Potomac Park, the National Mall, and the Plan of the City of Washington. This section of the park would be closed temporarily but is not a frequently used area; therefore, the closure would have a negligible effect on the National Mall and East and West Potomac Parks Historic Districts. No construction would happen within the public right-of-way of the streets, causing no adverse effect to the Plan of the City of Washington. All trees on the site would be removed for construction causing an adverse effect. After construction is completed, DC Water would coordinate with NPS to reopen this section of the park.

Permanent features that would be visible following construction include approximately five to seven at-grade manholes, three to four access hatches, and other access points to underground structures. Due to the site's location within the 100-year floodplain, several elements would be elevated approximately three to five feet above grade, including an electrical cabinet for the ventilation equipment, tunnel ventilation grating, and an access point to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to minimize adverse

effects and incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or as multiple smaller structures to reduce the visual intrusion. Finish materials such as stone or brick could be used as treatments on above-grade structures to be compatible with the surrounding architecture. The site could also be graded with a gentle slope to the top of a structure to create a mound that would integrate the DC Water structures into the landscape and soften the appearance. Alternatively, the site topography could be used to obscure the visible structures, or they could be concealed with shrubs or other vegetation. DC Water would coordinate closely with NPS, DC SHPO, and others to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

Temporary adverse effects would occur to historic properties under the CSO Control Option 1. Trees that are removed would be replaced in kind or with native species at a ratio and at locations coordinated with the NPS to minimize the adverse effect. The closure of the site to public use would also be temporary and the section of the park would reopen once construction was completed, with the same function. These temporary adverse effects would be mitigated and eliminated after construction was completed.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points would be placed as inconspicuously as possible within the site and would be designed in consultation with NPS, DC SHPO, and others to be appropriate with materials and details that would have minimal adverse effects on the park. Furthermore, as the facilities would be designed and situated to have minimal impact on the surrounding West Potomac Park and the National Mall; they would not have an adverse effect on any views from the resource to other historic sites, including views south the Lincoln Memorial and southeast to the Washington Monument.

Archaeological Resources

An archaeological assessment of the CSO 020 Options 1 and 2 construction areas determined that as these options are located within made-land where there is a low potential for the presence of near-surface archaeological resources (Kreisa et al. 2018). In addition, a review of geotechnical borings determined that this area has no potential for deeply buried, late Pleistocene-early Holocene dated archaeological deposits (Wagner 2018).

5.2.2.4.2 CSO 020 Control Option 2 – Lincoln Memorial Volleyball Courts

A majority of the construction associated with the CSO 020 Control Option at Lincoln Memorial Volleyball Courts would be temporary. The ground level construction area falls within West Potomac Park, the National Mall, and the Plan of the City of Washington. This section of the park would be closed temporarily including the volleyball courts that extend south into the construction site, resulting in an adverse effect to the historic districts. The courts would be reestablished once construction was completed so this section of West Potomac Park would continue to function as a recreational space. No construction would happen within the public right-of-way of the streets, causing no adverse effect to the Plan of the City of Washington. All trees on the site would be removed for construction resulting in an adverse effect. After construction is completed, DC Water would coordinate with NPS to reopen this section of the park.

Permanent features that would be visible following construction include approximately five to seven at-grade manholes, three to four access hatches, and other access points to underground structures. Due to the site's location within the 100-year floodplain, several elements would be elevated approximately five feet above grade, including an electrical cabinet for the ventilation equipment, tunnel ventilation grating, and an access point to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to minimize adverse effects and incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or as multiple smaller structures to reduce the visual intrusion. Finish materials such as stone or brick could be used as treatments on above-grade structures to be more compatible with the surrounding architecture. The site could also be

graded with a gentle slope to the top of a structure to create a mound that would integrate the DC Water structures into the landscape and soften the appearance. Alternatively, visible features could be situation near the entrance to the NPS maintenance facility on the south edge of the site, a more utilitarian location, and they could be concealed with shrubs or other vegetation. DC Water would coordinate closely with NPS, DC SHPO, and others to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

Temporary adverse effects would occur to historic properties under the CSO Control Option 2. Trees that are removed would be replaced in kind or with native species at a ratio and at locations coordinated with the NPS, minimizing the adverse effect. The closure of the site to public use would also be temporary and the section of the park would reopen once construction was completed, with the same function. The volleyball courts to the north of the site would be displaced during construction but reopened once construction was completed. These temporary adverse effects would be mitigated and eliminated after construction was completed.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points would be placed as inconspicuously as possible within the site and would be designed in consultation with NPS, DC SHPO, and others to be appropriate with materials and details that would have negligible adverse effects on the park. Furthermore, as the facilities would be designed and situated to have minimal impact on the surrounding West Potomac Park and National Mall; they would not have an adverse effect on any views from the resource to other historic sites, including views north to the Kennedy Center and views east to the Washington Monument and Lincoln Memorial.

Archaeological Resources

See *Section 5.2.2.4.1* for the assessment of effects to archaeological resources associated with CSO 020 Control Option 2.

5.2.2.5 Component 6 – CSO 021 Control

Under *Alternative B (Preferred Alternative)* an existing diversion facility would be placed into operation and connected to the tunnel via construction of a new deep underground adit. As outlined in *Section 4.2.6*, there would be no new at-grade or above-grade elements constructed at the CSO 021 Control. There would be no adverse effects, direct or indirect, as a result of the CSO 021 Control work.

Archaeological Resources

No archeological resources are present at the CSO 021 Control.

5.2.2.6 Component 7 – CSO 022 Control

Under *Alternative B (Preferred Alternative)* underground structures would be constructed to divert overflow from the existing CSO 022 outfall to the proposed tunnel. There are two options being considered under *Alternative B.*

5.2.2.6.1 CSO 022 Control Option 1 – Waterfront/Existing Outfall

The majority of construction associated with the CSO 022 Control Option 1 at Rock Creek and Potomac Parkway would be temporary. The Rock Creek Park Trail would temporarily be closed during the construction of the diversion facility, resulting in a temporary adverse effect. In coordination with NPS, Rock Creek Park Trail would be rerouted during construction causing a temporary adverse effect but reestablished with the same alignment and materials. The trees along the Potomac River and Rock Creek within the construction area would be removed resulting in an adverse effect.

Permanent features that would be visible following construction include approximately five to seven at-grade manholes, three to four access hatches, and other access points to underground structures. Due to the site's location

within the 100-year floodplain, several elements would be elevated approximately three to five feet above grade, including an electrical cabinet for the ventilation equipment, tunnel ventilation grating, and an access point to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to minimize adverse effects and incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or as multiple smaller structures to reduce the visual intrusion. Finish materials such as stone or brick could be used as treatments on above-grade structures to be more compatible with the surrounding architecture. The site could also be graded with a gentle slope to the top of a structure to create a mound that would integrate the DC Water structures into the landscape and soften the appearance. Alternatively, visible structures could be placed adjacent to existing facilities or concealed with shrubs or other vegetation. DC Water would coordinate closely with NPS, DC SHPO, and others to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

Temporary adverse effects would occur to historic properties under the CSO 022 Control Option 1. Trees that are removed would be replaced in kind with an approved planting plan coordinated with NPS, resulting in a temporary adverse effect. The closure of the site to public use would also be temporary and the section of the park would reopen once construction was completed, with the same function. Rock Creek Park Trail would be rerouted during construction, but reestablished after work was completed, causing a temporary adverse effect.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points would be placed as inconspicuously as possible within the site and would be designed in consultation with NPS, DC SHPO, and others to be appropriate with materials and details that would have negligible adverse effects on the park. Furthermore, as the facilities would be designed and situated to have minimal impact on the surrounding Rock Creek and Potomac Parkway; they would not have an adverse effect on any views from the resource to other historic properties, including views north to Rock Creek, views east and south to the Watergate Complex, views south to the Kennedy Center, and views west and south to the Potomac River, Theodore Roosevelt Island, and the Georgetown Waterfront.

Archaeological Resources

See *Section 5.2.2.2.3* for the assessment of effects to archaeological resources associated with CSO 022 Control Option 1.

5.2.2.6.2 CSO 022 Control Option 2 – Virginia Ave NW/27th St NW

Most of the construction associated with the CSO 022 Control Option at Virginia Avenue NW and 27th Street NW would be temporary. The ground level construction area falls within Rock Creek and Potomac Parkway and the Plan of the City of Washington. Traffic on Virginia Avenue NW and 27th Street NW would be impacted by temporary lane closures, causing an adverse effect to the Plan of the City of Washington. DC Water would implement an approved maintenance of traffic plan to keep the roads open during construction; for further information on the traffic impacts, refer to the Potomac River Tunnel EA. All trees on the site would be removed for construction causing an adverse effect.

Permanent features that would be visible following construction include approximately five to seven at-grade manholes, three to four access hatches, and other access points to underground structures. Temporary adverse effects would occur to historic properties under the CSO 022 Control Option 2. Trees that are removed would be replaced in kind with an approved planting plan coordinated with NPS and DDOT, resulting in a temporary adverse effect.

The at grade manholes, hatches, and other access points to underground structures would not have an adverse effect on any views from the resource to other historic sites, including views south to the Watergate Complex and views to the northwest and southeast, up and down Virginia Avenue NW.

Archaeological Resources

An archaeological assessment of CSO 022 Option 2 determined that the area to the west of 27th Street NW is likely to have been significantly disturbed by construction and demolition of the Briggs-Montgomery School and subsequent installation of the 16-foot diameter Potomac River Interceptor and 12.5-foot diameter Rock Creek Interceptor Sewers. Construction of the two existing sewers, along with disturbance associated with the construction and demolition of the school, has likely disturbed any deposits pre-dating the construction of the school in the early to mid-twentieth century. As such, there appears to be little potential for the presence of intact archaeological resources and no additional investigations are recommended west of 27th Street NW. The construction area east of 27th Street NW continues to retain a potential for the remains associated with mid-nineteenth century residential and commercial structures but has not been impacted by utilities installation or demolition to the same degree as the area to the west of 27th Street NW. If ground disturbance, such as installation of utilities for either construction of or operation of this facility is planned, DC Water will conduct a survey of the area to determine whether resources are present, and if present, will evaluate, minimize, or avoid impacts to those resources found eligible for listing in the National Register.

5.2.2.7 Component 8 – CSO 024 Control

Under *Alternative B (Preferred Alternative)* underground structures would be constructed to divert overflow from the existing CSO 024 outfall to the proposed tunnel. As outlined in *Section 4.2.8,* most of the construction would fall within the public right-of-way of K Street NW and within the Georgetown National Historic Landmark District. Traffic along K Street NW would be rerouted in a phased plan to keep traffic flowing through the site, resulting in a temporary adverse effect; for further information on traffic impacts, refer to the EA. Once construction was completed, this section of the K Street NW would be reopened with the same configuration it had prior to any work. A very small portion of the area would fall within the Rock Creek and Potomac Parkway Historic District.

Permanent features that would be visible following construction include approximately five to seven at-grade manholes, three to four access hatches, and other access points to underground structures. Due to the site's location within the 100-year floodplain, several elements would be elevated approximately three to five feet above grade, including an electrical cabinet for the ventilation equipment, tunnel ventilation grating, and an access point to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to minimize adverse effects and incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or as multiple smaller structures to reduce the visual intrusion. Finish materials such as stone or brick could be used as treatments on above-grade structures to be more compatible with the surrounding architecture. The features could also be incorporated into the pillars of the Whitehurst Freeway to integrate the DC Water structures into the landscape and soften the appearance. Alternatively, visible structures could be placed adjacent to existing facilities or concealed with shrubs or other vegetation. DC Water would coordinate closely with DDOT, CFA, and DC SHPO to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

Temporary adverse effects would occur to historic properties under the CSO 024 Control. Trees located on the site on 30th Street NW would be removed, but would be replaced in kind, resulting in a temporary adverse effect. Pedestrians would be rerouted around temporary sidewalk closures to maintain access to the Georgetown Waterfront. The sidewalks and public space would be returned to their pre-construction configuration after project completion.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points to underground structures would be placed as inconspicuously as possible within the site and would be designed in consultation with DDOT, CFA, and DC SHPO to utilize appropriate materials and details that would have negligible adverse effects on the historic district. Furthermore, as the facilities would be designed and situated to have minimal impact on the surrounding area of Georgetown, they would not have an adverse effect on any views from the resource to other historic properties,

including views north up 30th Street NW to Georgetown, south down 30th Street NW to the Potomac River, and views east and west along K Street NW.

Archaeological Resources

Archaeological assessment of the CSO 024 Control construction area determined there to be a low potential for the presence of intact resources within roadways given the presence of existing large diameter sewer lines (Kreisa et al. 2018). Therefore, no additional investigations are recommended for those construction areas confined to the roadways. The construction area to the south of K Street NW has not been impacted by the installation of substantial utilities. An archaeological assessment identified residential or commercial structures dating to the mid-nineteenth century at this location. If ground disturbance, such as installation of utilities for either construction of or operation of this facility is planned, DC Water will conduct a survey of the area to determine whether resources are present, and if present, will evaluate, minimize, or avoid impacts to those resources found eligible for listing in the National Register.

5.2.2.8 Component 9 – CSO 027 Control

Under *Alternative B (Preferred Alternative)* underground structures would be constructed to divert overflow from the existing CSO 027 outfall to the proposed tunnel. There are two site options being considered under *Alternative B.* An emergency surge relief pipe may be constructed at CSO 027 under either option.

5.2.2.8.1 CSO 027 Control Option 1 – K St NW/Georgetown Waterfront Park

The majority of the construction associated with CSO 027 Control Option 1 at K Street NW and Georgetown Waterfront Park would be temporary and fall within the public right-of-way of K Street NW, with a portion located within Georgetown Waterfront Park. The entire site falls within the Georgetown National Historic Landmark District. Temporary lane closures would be implemented along K Street NW in a phased plan to keep traffic flowing through the site; for further information on traffic impacts, refer to the EA. Once completed, this section of K Street NW would be reopened with the same configuration it had prior to any construction work.

Permanent features that would be visible following construction include approximately five to seven at-grade manholes, three to four access hatches, and other access points to underground structures. Due to the site's location within the 100-year floodplain, several elements would be elevated approximately three to five feet above grade, including an electrical cabinet for the ventilation equipment, tunnel ventilation grating, and access points to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to minimize adverse effects and incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or as multiple smaller structures to reduce the visual intrusion. Finish materials such as stone or brick could be used on above-grade structures to be more compatible with the surrounding architecture. The features could also be incorporated into the pillars of the Whitehurst Freeway to integrate the DC Water structures into the landscape and soften the appearance. Alternatively, visible structures could be placed adjacent to existing facilities or concealed with shrubs or other vegetation or be incorporated into the contemporary design of the Georgetown Waterfront Park. DC Water would coordinate closely with DDOT, NPS, CFA, DC SHPO, and others to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

In addition, should the emergency surge relief pipe outfall be constructed at the waterfront, the existing outfall pipe would remain in service as it cannot be repurposed due to insufficient capacity to perform both functions. The new outfall would be approximately ten feet in diameter and would be designed in consultation with NPS, DC SHPO, CFA, and others to ensure minimal adverse effects to the viewsheds from Francis Scott Key Bridge, George Washington Memorial Parkway and Theodore Roosevelt Memorial Island.

Temporary adverse effects would occur to historic properties under CSO 027 Control Option 1. All trees and vegetation on the site would be removed but replaced in accordance with an approved planting plan to be coordinated with NPS, CFA, and DC SHPO. The sidewalks and public space would be returned to their pre-construction configuration.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points would be placed as inconspicuously as possible within the site and would be designed in consultation with CFA, DC SHPO, and others to utilize appropriate materials and details that would have minimal adverse effects on the historic district. Furthermore, as the facilities would be designed and situated to have minimal effects on the surrounding area of Georgetown, they would be designed to not have any adverse effects on any views from the resource to other historic properties, including view northwest to Francis Scott Key Bridge, views west and south to the Potomac River and George Washington Memorial Parkway, and views south and east to the Potomac River, Theodore Roosevelt Island, Watergate Complex, and Kennedy Center.

The temporary and permanent construction effects would be negligible to the historic property. The permanent construction would be designed to be incorporated within the streetscape and park to have no adverse effect to the Georgetown National Historic Landmark District. The emergency surge relief pipe outfall, if constructed, would be incorporated into the existing seawall and would have a minimal adverse effect on views from across the Potomac River into Georgetown. Should the emergency relief pipe be removed from Option 1, adverse effects to the seawall would be eliminated, and temporary construction within Georgetown Waterfront Park would be greatly reduced. The indirect adverse effects to other resources are discussed in *Section 5.2.*1.

Archaeological Resources

One registered archaeological site, 51NW075, encompasses the CSO 027 Control Options 1 and 2 (Kreisa et al. 2018) construction areas. This archaeological site has not been evaluated for listing in the National Register. Prior to construction, DC Water would perform a National Register evaluation of this archaeological resource and minimize or mitigate adverse effects if it is found to be eligible for listing. Additionally, an assessment of the submerge area of the Potomac River adjacent to the shoreline was conducted for construction of the emergency surge relief pipe, if constructed at CSO 027. The assessment indicated the potential for the presence of the remains of wharves, docks, and bulkheads dating to the nineteenth and early twentieth centuries. Archaeological investigation is required to determine the presence and potential significance of such archeological resources. DC Water would perform archaeological investigation of all areas not yet surveyed within the areas to be excavated within the Potomac River if the emergency overflow structure is constructed at CSO 027, conduct National Register evaluations of any resources encountered, and would minimize or mitigate adverse effects to archaeological resources found to be eligible for listing in the National Register.

5.2.2.8.2 CSO 027 Control Option 2 – Georgetown Waterfront Park

Most of the construction associated with CSO 027 Control Option at Georgetown Waterfront Park would be underground and fall within the limits of the park. A temporary adverse effect would result from the closure of this portion of Georgetown Waterfront Park. DC Water would minimize this adverse effect by maintaining pedestrian access to the adjacent portions of the park throughout the duration of the construction period.

Permanent features that would be visible following construction include approximately five to seven at-grade manholes, three to four access hatches, and other access points to underground structures. Due to the site's location within the 100-year floodplain, several elements would be elevated approximately five feet above grade, including an electrical cabinet for the ventilation equipment, tunnel ventilation grating, and an access point to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to minimize adverse effects and incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or

as multiple smaller structures to reduce the visual intrusion and would be designed to blend in with the surrounding urban park. Finish materials such as stone or brick could be used as treatments on above-grade structures to be more compatible with the surrounding landscape. Alternatively, visible structures could be placed adjacent to existing facilities or concealed with shrubs or other vegetation or be incorporated into the contemporary design of the Georgetown Waterfront Park. DC Water would coordinate closely with NPS, CFA, DC SHPO, and others to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

In addition, should the emergency surge relief pipe outfall be constructed at the waterfront, the existing outfall pipe would remain in service as it cannot be repurposed due to insufficient capacity to perform both functions. The new outfall would be approximately ten feet in diameter and would be designed in consultation with NPS, DC SHPO, CFA, and others to ensure minimal adverse effects to the viewsheds from Francis Scott Key Bridge, George Washington Memorial Parkway and Theodore Roosevelt Memorial Island.

Temporary adverse effects would occur to historic properties under CSO 027 Control Option 2. A section of Georgetown Waterfront Park would be closed for the duration of the construction, but public access would be maintained to the adjacent sections throughout construction. All trees and vegetation on the site would be removed but replaced in accordance with an approved planting plan to be coordinated with CFA and DC SHPO.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points would be placed as inconspicuously as possible within the site and would be designed in consultation with NPS, CFA, DC SHPO, and others to be appropriate with materials and details that would have minimal adverse effects on the historic district. Furthermore, as the facilities would be designed and situated to have minimal effects on the surrounding area of Georgetown, they would be designed to not have any adverse effects on any views from the resource to other historic properties, including view northwest to Francis Scott Key Bridge, views west and south to the Potomac River and George Washington Memorial Parkway, and views south and east to the Potomac River, Theodore Roosevelt Island, Watergate Complex, and Kennedy Center.

The temporary and permanent construction effects would be negligible to the historic property. The permanent construction would be designed to be incorporated within the streetscape and park to have no adverse effect to the Georgetown National Historic Landmark District. The emergency surge relief pipe outfall, if constructed, would be incorporated into the existing sea wall and would have a minimal adverse effect on views from across the Potomac River into Georgetown. Should the emergency relief pipe be removed from Option 2, adverse effects to the seawall would be eliminated, and temporary construction within Georgetown Waterfront Park would be reduced. The adverse effects to other resources are discussed in *Section 5.2.*1.

Archaeological Resources

See *Section 5.2.2.8.1* for the assessment of effects to archaeological resources associated with CSO 027 Control Option 2.

5.2.2.9 Component 10 – CSO 028 Control

Under *Alternative B (Preferred Alternative)* underground structures would be constructed to divert overflow from the existing CSO 028 outfall to the proposed tunnel. The whole ground level construction area would fall within the Georgetown National Historic Landmark District, the C&O Canal NHP, and the Potomac Gorge. The Capital Crescent Trail runs directly through the area and would be rerouted during construction resulting in a temporary adverse effect.

Permanent features that would be visible following construction include approximately five to seven at-grade manholes, three to four access hatches, and other structures access points. Due to the site's location within the 100-year floodplain, several elements would be elevated approximately eight feet above grade, including an electrical cabinet,

tunnel ventilation grating, and an access point to the ventilation control vault. DC Water has sufficient flexibility to locate and design these features to minimize adverse effects and incorporate them into the landscape. Many of the above-grade facilities could be constructed as individual structures or as multiple smaller structures to reduce the visual intrusion. Finish materials such as stone or brick could be used as treatments on above-grade structures to be more compatible with the surrounding architecture. Alternatively, visible structures could be placed adjacent to existing facilities or concealed with shrubs or other vegetation or be incorporated into the steep slope of the C&O Canal towpath. DC Water would coordinate closely with NPS, DC SHPO, CFA, and others to ensure that the design of each feature is appropriate for the site and to ensure the site retains its character-defining features.

In addition, should the emergency surge relief pipe be constructed at CSO 028, a new pipe, approximately ten feet in diameter, would need to be constructed at the shoreline resulting in an adverse effect to the C&O Canal NHP. The pipe would be partially visible above the mean water level of the Potomac River, but would be designed in consultation with NPS, DC SHPO, CFA, and others to ensure it blends with the surrounding landscape. There would be adverse effects to the viewsheds from Francis Scott Key Bridge, George Washington Memorial Parkway and The Potomac Gorge.

Temporary adverse effects would occur to historic properties under the CSO 028 Control. A section of the Capital Crescent Trail along with access to the Washington Canoe Club would be rerouted and maintained for the duration of construction resulting in a temporary adverse effect. All trees and vegetation on the site would be removed but replaced either in kind or with native plants in a ratio and at locations coordinated with the NPS to minimize the adverse effect.

The above-grade electrical cabinets, tunnel ventilation grating, and other access points would be placed as inconspicuously as possible within the site, towards the canal embankment, to avoid interrupting the Capital Crescent Trail. Ultimately, visible structures would be designed in consultation with NPS, DC SHPO, CFA, and others to be appropriate with materials and details that would have negligible adverse effects the Georgetown National Historic Landmark Distract, C&O Canal NHP, and the Potomac Gorge. Furthermore, as the facilities would be designed and situated to have minimal effects on the surrounding areas, they would be designed to not have adverse effects on any views from the resource to other historic properties, including the view west, down the Capital Crescent Trail, the view east toward the Aqueduct Abutment and Pier, and views south to the Potomac River, Francis Scott Key Bridge and George Washington Memorial Parkway. Should the emergency surge relief pipe be constructed at CSO 027, the adverse effects to the shoreline and viewsheds would be eliminated at CSO 028, and temporary construction on the Potomac River would be eliminated.

Archaeological Resources

A recent geoarchaeological survey of the area encountered buried structural debris near the mapped location of mid-nineteenth-century or early twentieth-century commercial and recreational structures (Kreisa et al. 2018). These archaeological deposits have not been evaluated for listing in the National Register. Prior to construction, DC Water would perform National Register evaluations of this archaeological resource and minimize or mitigate adverse effects if it is found to be eligible for listing. An archaeological assessment of the potential emergency surge relief pipe location at CSO 028 indicated the potential presence of late nineteenth-century and twentieth century structure remains, including a boat club dock (Kreisa et al. 2018). Archaeological investigation is required to determine the presence and potential significance of archeological resources if the emergency surge relief pipe is constructed at this location. DC Water would perform archaeological investigation of all areas not yet surveyed within the terrestrial and submerged areas to be excavated, conduct National Register evaluations of any resources encountered, and would minimize or mitigate adverse effects to archaeological resources found to be eligible for listing in the National Register.

5.2.2.10 Component 11 – CSO 029 Control

Under Alternative B (Preferred Alternative) underground structures would be constructed to divert overflow from the existing CSO 029 outfall to the proposed tunnel. There are two site options being considered under Alternative B.

5.2.2.10.1 CSO 029 Control Option 1 – Canal Road NW/Georgetown University Southwest Entrance

As outlined in *Section 4.2.11*, construction of CSO 029 Option 1 would fall within the Georgetown National Historic Landmark District. Construction would be temporary and once completed, the public-right-of-way would be reopened with similar configuration and materials as prior to any work.

Permanent features that would result from construction would include an electrical cabinet, between five and seven at-grade manholes, ventilation grating, approximately three to four hatches, and other access points to the underground structures. Pending final design, permanent or temporary retaining wall(s) may be required to facilitate underground facility construction or maintenance of traffic and secure the steep slope(s) to the east and/or west of the Georgetown University entrance. The materials and design of any permanent walls would be executed in consultation with DC SHPO, CFA, Georgetown University, and others, as appropriate.

The temporary and permanent construction effects would be negligible to the historic property. The permanent construction would have no adverse effect to the Georgetown National Historic Landmark District and would not adversely affect character-defining views east and west along Canal Road NW or those to the south, including the C&O Canal, as it is not visible from the road.

Archaeological Resources

A previous archaeological survey conducted for the Georgetown University southwest entrance identified archaeological site 51NW112 located in the north portion of the CSO 029 Control Option 1 construction area. This archaeological site has not been evaluated for listing in the National Register. To the southwest a recent geoarchaeological survey of the area encountered deeply buried structural debris where historic maps depict one or more structures dating as early as 1802 (Kreisa et al. 2018). These archaeological deposits have not been evaluated for listing in the National Register. Prior to construction, DC Water would perform National Register evaluations of these archaeological resources and minimize or mitigate adverse effects if it is found to be eligible for listing.

5.2.2.10.2 CSO 029 Control Option 2 – South of Georgetown University

As outlined in *Section 4.2.12*, construction of CSO 029 Option 2 would fall within the Georgetown National Historic Landmark District. Construction would occur on Georgetown University property and would be temporary.

Permanent features that would result from construction would include an electrical cabinet, between five and seven at-grade manholes, ventilation grating, approximately three to four hatches, and other access points to the underground structures. Due to the steep slope up from Canal Road, none of the permanent features would be visible form the street.

The temporary and permanent construction effects would be negligible to the historic district. The permanent construction would have no adverse effect to the Georgetown National Historic Landmark District and would not adversely affect character-defining views east and west along Canal Road NW. To the south the C&O Canal and the Potomac River are not visible from the road and there would be no temporary or permanent construction effects.

Archaeological Resources

Phase IB survey is recommended prior to the construction of CSO 029 Control Option 2. Assessment of the areas not yet surveyed indicates that there remains a moderate potential for the presence of pre-contact Native American and Historic period (streetcar line) archaeological resources (Kreisa et al. 2018). As further investigation is required to determine the presence and potential significance of archeological resources at the site, DC Water would perform an archeological survey of all areas not yet surveyed within the construction area, National Register evaluations of any resources encountered, and would minimize or mitigate adverse effects to archaeological resources found to be eligible for listing in the National Register.

5.2.2.11 Component 12 – Tunnel Connection to existing Shaft at JBAB

Under *Alternative B (Preferred Alternative)* the Potomac River Tunnel would be connected to the existing shaft at JBAB to allow for contents of the tunnel to be transported to Blue Plains for treatment. As outlined in *Section 4.2.12*, all the construction would occur under ground and would not be in or near any historic properties. The temporary and permanent construction effects would have no adverse effects, direct or indirect, to any historic properties.

Archaeological Resources

Previous archaeological investigations associated with the construction of the tunnel facilities at JBAB found no archaeological resources (Kreisa et al. 2018). As such, any disturbance associated with the tunnel connection would have no effects to archaeological resources.

5.2.3 POTENTIAL ADVERSE EFFECTS TO HISTORIC PROPERTIES WITHIN THE CSO 027, 028, AND 029 SEWERSHEDS DUE TO CONSTRUCTION OF GREEN INFRASTRUCTURE

As required by the Amended Consent Decree, DC Water will perform a practicability study of the utilization of GI technologies to provide the required level of control for CSOs 027, 028, and 029. The practicability assessment will evaluate constructability, operability, efficacy, public acceptability, and cost per impervious acre. If found practicable, GI would be implemented in lieu of Components 9, 10, and 11.

Although specific locations and details of GI facilities have not been determined, GI controls would be constructed primarily in the public right-of-way, typically in planter strips, alleys, and roadways. Three primary types of GI technology are likely to be considered within the CSO 027, 028, and 029 sewersheds, including bioretention in the planter strips and as curb extensions, permeable pavement in the parking lanes and in alleys, and subsurface storage may beneath roadways and sidewalks.

5.2.3.1 Bioretention Facilities

Bioretention facilities are shallow, vegetated depressions that collect, filter, and temporarily detain runoff before allowing it to infiltrate the in-situ soils or conveying it to a suitable outlet (such as an existing sewer or stormwater pipe). The typical depth of excavation for bioretention is seven feet, which includes the depressed area, a layer of engineered soil, and an aggregate storage layer. These facilities could include trees, shrubs, perennials, and groundcover plantings. These systems mimic natural hydrology to reduce CSOs.

As in natural systems, water is stored in the spaces between the soil particles and aggregate. Some is used by the plants and re-released to the atmosphere through evapotranspiration, while some may infiltrate the ground, depending on existing soil conditions. The remainder is returned to the sewer system via a perforated underdrain at a slower rate.

Two primary variations of bioretention are anticipated to be implemented:

- Planter bioretention would be utilized in existing green space, between the curb and sidewalk. Facilities would have edging around all four sides, which is approximately eighteen inches in height. Step-out zones would be provided as required when adjacent to existing parking.
- Curb extension bioretention would extend the existing curb into the roadway to a width equivalent or less than the existing parking lane, where appropriate, based on traffic safety studies. This type of facility is typically located near intersections and can offer traffic calming pedestrian safety benefits while managing stormwater.

5.2.3.2 Permeable Pavement

Permeable pavement could be used to replace traditional impervious pavements in existing parking lanes and alleys as they offer similar functionality with respect to vehicle and pedestrian traffic. Permeable pavement for the parking lane

is a porous asphalt to match the existing surface material along the roadway. In alleys, the surface material could be either porous asphalt or pervious concrete or brick pavers, intended to match the existing surface material as closely as possible in each alley.

The typical maximum depth of excavation for permeable pavement is approximately five feet, which includes the depth of the pavement material itself, an engineered base, and an aggregate storage layer. As with bioretention, water is temporarily stored in the spaces between the aggregate. Some of this water may infiltrate the ground, depending on existing soil conditions, and whether an impermeable liner is required to protect existing infrastructure. Perforated underdrains return remaining stormwater volume to the existing underground sewer infrastructure at a slower rate.

5.2.3.3 Subsurface Storage

Subsurface storage can be used to store stormwater beneath the sidewalks either independently or as an augmentation to adjacent bioretention or permeable pavement. Capturing the excess runoff and redistributing it back in to the sewer system at a slower rate aids in the control of overflows. Subsurface storage consists of a gravel storage reservoir underneath the road or sidewalk, which is replaced in kind when construction is complete. Stormwater runoff is diverted into the facility via typical curb or grate inlets, where it is temporarily stored in the spaces between the aggregate. Some of this water may infiltrate the ground, depending on existing soil conditions, and whether an impermeable liner is required to protect existing infrastructure. Perforated underdrains return remaining stormwater to the existing underground sewer infrastructure at a slower rate.

5.2.3.4 Potential Effects to Historic Properties due to GI Construction

Until the practicability of GI is determined, the type, number, location, design, and construction techniques of GI facilities throughout sewersheds 027, 028, and 029, cannot be finalized. As a result, this report can only describe potential types of GI technology to be used, as described in *Section 4.2.13*, and above within *Section 5.2.3.1* through *Section 5.2.3.3*, and identify the historic properties within each sewershed, which can be found in **Table 2.2**. Should GI be determined practicable, DC Water would continue consultation following the appropriate regulatory processes. As any GI facilities move through the siting and design phases, all local permitting and review processes, including reviews by CFA under the Old Georgetown Act of 1950, as applicable, would be followed.

Archaeological Resources

An archaeological assessment has not been conducted specific to GI implementation in the CSO 027, 028, and 029 sewersheds. Previous archaeological investigations have been conducted for a variety of unrelated undertakings within the sewersheds, although less than 1 percent of the areas have been investigated for the presence of archaeological resources. These investigations have resulted in the identification of several archaeological resources. Overall, it is likely that many of the GI areas have a potential for the presence of currently unidentified archaeological resources.

Sites where GI measures could potentially be constructed would need to be investigated to determine the presence and potential significance of archeological resources. Identification of archaeological resources at these locations, and the evaluation of all unevaluated resources, where appropriate, would need to be conducted. If any resources are found to be eligible for listing in the National Register, DC Water, DC SHPO, and others participating in the consultation process for the project would identify opportunities to avoid, minimize, or mitigate any adverse effects.

5.3 SUMMARY OF EFFECTS

To resolve the adverse effects associated with the project, DC Water and NPS intend to pursue the negotiation and execution of an agreement document in accordance with 36 CFR 800.6(c). The agreement document would define the continued consultation process for the identification and evaluation of resources, and the resolution of any adverse effects on historic properties, including archaeological resources, associated with the Potomac River Tunnel project.

DC Water and NPS would work with DC SHPO, and the consulting parties, to identify strategies to avoid, minimize, and mitigate all adverse effects identified within this report. Those measures would be outlined and included within the agreement document. This would include those portions of the project that are subject to additional refinement, including exact siting of facilities and their design.

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6.0 SUMMARY OF SECTION 106 CONSULTATION

DC Water and NPS conducted public involvement during the Section 106 process to provide an opportunity for the public to comment on the proposed undertaking. Consultation included public involvement and coordination with federal and District agencies, American Indian tribes, and other interested parties to identify historic preservation issues and other project-related concerns. This section provides a summary of Section 106 consultation that occurred during the preparation of this AOE Report.

6.1 PUBLIC INVOLVEMENT

As a part of the NEPA and Section 106 compliance processes, DC Water and NPS involved the public in project planning by holding a formal public scoping period from July 2, 2014 to August 31, 2014. The public, agencies, stakeholders, and other interested parties were invited to submit comments on the project during this period and to attend a public scoping meeting held in the evening on July 31, 2014 at the Lab School of Washington. The public scoping meeting was held to provide interested members of the public with an opportunity to learn about the proposed Potomac River Tunnel project, identify any areas of concern regarding the proposed project, provide the opportunity for the public to share their knowledge of important environmental and cultural issues that should be considered during planning, and gain public feedback to help inform the development of project alternatives.

To announce the public scoping comment period and meeting, DC Water and NPS published ads in four local papers (*The Washington Post* [July 6, 2014], *The Northwest Current* [July 2, 2014], *The Washington City Paper* [July 4, 2014], and *The Georgetowner* [July 2, 2014]); distributed a public scoping newsletter (July 14, 2014) to individuals and groups within ½ mile of the Potomac River Tunnel study area using GIS/address data from DC Water's customer service database; posted project information, including the scoping newsletter, to the NPS Planning, Environment and Public Comment website and DC Water's website; issued an email blast (July 17, 2014) announcing the public scoping meeting to Advisory Neighborhood Commission (ANCs) within the Potomac River Tunnel study area as well as other interested parties; and made robocalls (July 21, 2014) announcing the public scoping meeting to DC Water customers within ½ mile of the project study area. Seventeen public correspondences and two agency correspondences were received during the scoping period.

6.2 AGENCY AND TRIBAL CONSULTATION AND COORDINATION

Following the implementing regulations of the National Historic Preservation Act (36 CFR § 800), NPS and DC Water initiated consultation with the DC SHPO in November 2014. The NPS and DC Water have hosted a series of Section 106 meetings to discuss the project, including a public scoping meeting on July 31, 2014, a joint NEPA/Section 106 agency informational meeting on January 29, 2015, and Section 106 consulting parties' meetings on January 29, 2015, December 15, 2017, and June 20, 2018. Summaries of the consulting parties' meetings are provided in **Appendix A**.

In addition to Section 106 consultation initiation and consulting parties' meetings, consultation regarding potential impacts to archaeological resources for the Potomac River Tunnel has followed the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* and the DC Preservation League's *Guidelines for Archaeological Investigations in the District of Columbia*. To date, DC Water has completed a Phase IA archaeological assessment of the construction areas, and a Phase IB archaeological resource survey for selected construction areas determined to have high archeological potential. DC Water prepared Phase IA and IB work plans that were submitted to DC SHPO and NPS for approval prior to the initiation of investigations. Upon completion of the Phase IA and IB investigations, DC Water prepared a management summary of the results for review and comment by DC SHPO and NPS. DC Water obtained NPS Archeological Resource Protection Act permit 17-CHOH-NAMA-ROCR-009, effective August 1, 2017 to August 1, 2018, and several NPS special use and short-term construction permits to conduct Phase IB field investigations on NPS property, as well as District Department of Transportation and District Department of

Energy and Environment permits for Phase IB field investigations on District property. DC Water has prepared a combined Phase IA and Phase IB technical report of investigations that has been submitted to DC SHPO and NPS.

DC Water and NPS initiated tribal consultation on August 29, 2017. Letters seeking consultation were sent to the Delaware Nation and the Pamunkey Indian Tribe. In response, Delaware Nation's Director of Cultural Resources/Section 106 Compliance responded that the Delaware Nation concurred at present with the proposed plan and requested to be a consulting party. The response requested that the Delaware Nation be kept up to date on the progress of the project and to be contacted if any discoveries arise. To date, the Pamunkey Indian Tribe has not provided comments on the project but has requested consulting party status.

The following agencies and stakeholder organizations were contacted to request input on the project as part of the NEPA and/or Section 106 of the National Historic Preservation Act compliance processes. Individuals without affiliation were also consulted, but their names are excluded for privacy.

Advisory Council on Historic Preservation
ANC 2A
ANC 2B
ANC 2E
ANC 3B
ANC 3D
Audubon Naturalist Society
Bethesda-Chevy Chase Crew & Boosters
C&O Canal Association
C&O Canal Trust
Capital Rowing Club
Capital SUP
Capital Yacht Club
Chesapeake Bay Yacht Club Association
Citizens Association of Georgetown
Coalition for the Capital Crescent Trail
CFA
Committee of 100 on the Federal City
DC Office of Planning
DC Preservation League
Defenders of Potomac River Parkland
Delaware Nation
DC Department of Energy and Environment
DC Department of Transportation
District of Columbia Council
Executive Office of the Mayor
Foggy Bottom Association
Foxhall Community Citizens Association
Friends of Georgetown Waterfront Park
General Services Administration
George Washington University
George Washington University Rowing
Georgetown Business Association
Georgetown Business Improvement District
Georgetown Heritage
Georgetown University
Georgetown Women's Rowing
Grace Episcopal Church
Guest Services, Inc.
Guild of Professional Tour Guides of DC
Historical Society of Washington, DC
House of Sweden
JBAB
Kennedy Center
Key Bridge Boathouse
Marine Evolutions
Muse Architects
National Association for Olmsted Parks
NCPC
National Cathedral and St. Albans Crew
National Coalition to Save Our Mall
National Oceanic and Atmospheric Administration
NPS (incl. all relevant parks and programs)
National Trust for Historic Preservation
Palisades Citizens Association
Pamunkey Indian Tribe
Port of Washington Yacht Club
Potomac Boat Club
Potomac River Sailing Association
Potomac River Sports Foundation
Potomac Riverkeeper
Rock Creek Rowing
Seafarers Yacht Club of Annapolis
Sierra Club
St. Albans School
St. John's College High School
Surfrider Foundation
The Federal City Council

The Georgetown Voice
The Georgetowner
The Hoya
Trout Unlimited
Trust for the National Mall
United States Coast Guard
US Army Corps of Engineers
US Institute of Peace
Virginia Scholastic Rowing Association
Washington Area Bicyclist Association
Washington Canoe Club
Washington City Paper
WMATA
Washington-Lee High School Crew
Watergate East - Management Office
Watergate Hotel
Watergate West Apartments and Co-op
WaveOne Swimming
WeCanRow DC
West End Citizens Association
Winston Real Estate
Woodrow Wilson High School Crew Boosters
Yorktown High School Crew Boosters

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APPENDIX A: CONSULTING PARTIES' MEETING SUMMARIES

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DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY | 5000 OVERLOOK AVENUE, SW | WASHINGTON, DC 20032

Meeting Minutes
DC Water Clean Rivers Project
Potomac River Tunnel Consulting Parties Meeting

Meeting Information		Document Information	
Topic	Potomac River Tunnel EIS	Edition	1st
Date	January 29, 2015	Revision Date	
Est. Start	1:00pm		
Est. Finish	3:00pm		
Location	NPS NCR Classroom B	Recorded By	Stantec

Invited/Attended:

DC Clean Rivers		Traceries		Stantec	
Angela Essner	AE	Laura Hughes	LH	Joan Glynn	JG2
John Cassidy	JC	Kim Daileader	KD1	Robin Griffin	RG
Carlton Ray	CR	Kim DeMuro	KD2	Jessica Davis	JD
Brandon Flora	BF			Paul Kreisa	PK
		Joel Gorder, NPS	JG1		

Other Abbreviations:
APE: Area of Potential Effects
CSO: Combined Sewer Overflow
EIS: Environmental Impact Statement
DCCR: DC Clean Rivers
EA: Environmental Assessment
PRT: Potomac River Tunnel
GI: Green Infrastructure
DDOT: DC Dept of Transportation
NPS: National Park Service

Additional Distribution of Final Edition of Minutes and Attachments:

Attachments
Potomac River Tunnel Section 106 PowerPoint Presentation
Area of Potential Effect handout

Meeting Purpose:
The purpose of the meeting was to provide consulting parties with an interest in the Section 106 process an overview of the Potomac River Tunnel project and the APE.

The meeting began with introductions by CR. JC began the presentation by explaining the DCCR project and why it is needed. BF took over and explained the design concepts behind the proposed projects and LH finished the presentation by speaking about the Section 106 consultation process and fielding questions.

Ruth Trocolli began the discussion by noting that all the historical assets shows on both APE maps were either historic districts or standing buildings; no archeological resources were shown on either map. LH agreed with her statement.

Grace Church asked if the designs for the tunnels and GI take into account projected population increases for the district. CR answered that yes, the designs included a growth factor.

Dr. Stephen Potter asked about CSO 22 and potential ground disturbance. JC pointed out that the area around CSO 22 was within the APE outlined in green. Dr. Potter stated that he hoped there would be further investigation in this area because one of the most significant prehistoric sites in the districts exists here.

Andrew Lewis asked why the APE for the GI portion of the project extends so far north. JC explained that the APE for the GI was based on sewer sheds and any water that falls in this area would wind up in one of the CSOs. Mr. Lewis then asked about the NPSs involvement in the project and why they were acting as co-lead agency. JG1 stated that much of the construction of this project will be conducted on NPS land so therefore they are a cooperating agency. Mr. Lewis went on to state that their organization and DC Water have been working together on various DCCR projects for many years and none of them so far have been determined to have an adverse effect. He stated that visual impacts have been minimal and overall DC Water has been very cooperative with the archeology aspect of the process. Ms. Tricolli added that archeology would be important to consider because there would be a large area of ground disturbance with construction activity and in addition, there could be significant archeological sites when they dig for the tunnel shaft. Dr. Potter added that if any guests at the meeting wanted an overview of the archeological sites near CSO22 he could direct them to a website that would be helpful. Dr. Potter also gave examples of prehistoric sites that were discovered during projects such as this one.

A guest asked if the GI alternative would be as effective in controlling stormwater runoff as a tunnel would be. JC/BF answered that yes, it was determined that GI would result in the same amount of control as the tunnel.

Mr. Walter Groszyk mentioned that the Citizens Association of Georgetown had provided comments during the public scoping meeting and he wondered if they would get a response. He is concerned about the potential effects of GI on Georgetown and he suspects many people in Georgetown would be opposed to the project if GI was implemented. JG1 responded that all comments received would be summarized and responded to by being incorporated into the EIS. Any concerns will be addressed with mitigation. Mr. Groszyk added that he was unsure how a response from DC Water would be good enough to appease the Citizens Association because they were already against many of the GI techniques that would result in tearing up the sidewalks and roads. Unless GI techniques were revised, he was unsure how GI would work in Georgetown. JG2 added that the next document to come out would be a draft EIS and all comments would be addressed in it and mitigation techniques would be explored.

Another guest asked if they could explain how they determined there was enough area within Georgetown to meet their goals under GI. JC responded that a study was conducted to determine how much area was required to meet their needs under GI and they used aerial photography to determine areas in Georgetown that they may be feasible. JC added that GI needed to be developed further in the design process before they could answer any questions about exactly what GI features would be implemented. Another guest voiced concern that DC Water would implement GI whether or not Georgetown was agreeable to it. CR responded that that was not the case. He said that GI and the project would not be successful if the neighborhood was not cooperating with the effort. JG1 added that through the NEPA/Section 106 process, they would be able to identify these concerns and come up with an agreement that would dictate how GI would be allowed to be implemented into Georgetown.

Another guest brought up the possibility of an interceptor tunnel being used to divert CSOs to the tunnel instead of building a new tunnel. He wondered if that was still a potential alternative. JC responded that if it is an existing tunnel then it is not possible because they don't have any more capacity to hold more water.

A guest asked when DC Water expected to get a decision regarding the modification to the consent decree. CR responded that discussions are still on-going but he thinks they are close to an agreement on the matter. The guest asked if and who were opposing the modification. CR responded that no one was outright opposing the modification but there were some who felt that a deal is a deal and DC Water should stick with the original agreement but after some discussion, most were coming around to the idea of a modification and it was just a matter of details at this point.

Ms. Cecilia Browning asked about her Bay Saver structure that she has at her building and what she would need to do with it if the CSOs were successfully taken care of by the tunnel. CR responded that DC Water would have to come out and personally discuss what would need to be done.

Another guest asked about the design life of the new tunnel that would be put in. He noted that the CSOs are over 130 years old which is probably past their designed life. CR stated that all DC Water tunnels have a 100 year design life but he felt strongly that the tunnels would last up to 400 years with proper maintenance. The guest asked if there were plans to replace the old, existing tunnels. CR stated that DC Water has a program to target and repair failing sewer systems. The guest asked if DC Water was planning to coordinate with any other utilities while they were digging up the streets. CR responded that yes, DC Water will and has previously worked with other agencies on necessary repairs to utilities to minimize cost and disruption to residents. The guest recalled a time when the district was doing repairs in the area and the sewer lines were not replaced during construction. CR stated that all sewers don't need to be replaced and there are many ways to rehab the sewers to address repair needs.

A guest raised concerns about GI plans in Georgetown and how the GI techniques may result in unforeseen impacts such as basement flooding with greater rainwater infiltration. CR noted that DC Water realizes that not all GI techniques are appropriate for all areas and they will have to do their due diligence before any decisions are made. CR added that they are also working with businesses on the private side to see how they can encourage new GI buildings with things like green roofs.

A guest asked about the maintenance of the GI areas. CR stated that these areas would be public space and the responsibility of maintenance would fall on DC Water because of the permits they received. If the

GI areas are not maintained then they do not count towards the pollution reduction standards. A guest asked if CR could elaborate on street maintenance activities since that usually falls within the jurisdiction of DDOT. CR answered that DC Water would be responsible for what it builds and they would work with DDOT as much as possible.

A guest asked if CR could give an example of a joint maintenance project that was successful. JC answered that Irving Street was an example of a project. DC Water installed and maintains a bio-retention pond that is near the roadway but DDOT is responsible for maintaining the curbs and grass that are adjacent to the pond.

A guest asked about a detailed description of all the proposed GI actions in Georgetown. CR responded that one was not available yet because it is early in the design process and they are still waiting to hear about the consent decree modification. The guest wanted to confirm that the consent decree modification did not represent a point of no return; if the consent decree is modified does that mean that GI has to be built in Georgetown. CR responded no, they could just build the extended tunnel if there is no support for GI or if GI doesn't work.

A guest stated that it would be helpful to see how/if GI worked in other areas of the country and also asked if the draft EIS would be made public. CR answered that yes DC Water would try to provide examples and yes, the draft would be made publicly available.

Jennifer Hirsh asked about potential above ground activities related to each CSO. JC explained that there would be surface disruptions at each CSO that DC Water was planning to connect to the tunnel in order to build the diversion device and the drop shaft. He added that the construction area for each CSO did not need to be at the exact spot of the outfall, but could be located in an area near the outfall. CR added that there would also be a surface disruption if they had to build a new pumping station. JC explained the pumping station concepts and how DC Water would need to find a site to build a new pumping station if the gravity tunnel could not be built. CR added that building a new pumping station in the area of the Lincoln Memorial or anywhere near the mall was not ideal and DC Water did not prefer that alternative. Ms. Hirsh responded that the reason she was asking was because any above ground activities in the district that involve multiple federal agencies could trigger NCPC to become involved. CR clarified that the pump station would be underground.

A guest asked if there would be a need for a large scale access point at the end of the tunnel. CR explained that there would be multiple places along the tunnel that would provide access for maintenance activities and this would be done every ten years or so.

A guest asked if the gravity tunnel option is feasible because it seems like a longer tunnel would cost significantly more money. CR answered yes this is true because a longer tunnel meant the tunnel could be more narrow and still have the same storage capacity.

A guest noted that the Vietnam Memorial Education Center was to be located near one of the potential mining sites. CR acknowledged that DC Water is aware. Mr. Frank Lindstrom added that DC Water would also be building in the floodplain and CR also acknowledged that fact.

Another guest asked if the storage capacities between the gravity tunnel option and the pumping station option were the same. CR answered that the pumping station option would result in 21 million gallons of storage and the gravity tunnel option would result in 30 million gallons of storage and they would each have 6-12 hours of emptying time.

A guest asked why the GI alternative is preferred over building a longer tunnel. CR responded that there are many benefits of GI that would improve the city as a whole; things like reducing the heat island effect, improving air quality and helping people with asthma are all expected benefits under the GI option. The guest asked if GI was possible to implement without tearing up all of Georgetown's streets and sidewalks. CR responded that DC Water did not plan to tear up all the roads and sidewalks in Georgetown and the suggestion was far-fetched.

A guest recalled a recent time where Georgetown was contacted to put pervious pavement in certain areas and there was a lot of support from the residents. He stated that it was a fairly small area but he did not recall there being a major disruption by the activity. Another guest added that he remembered the project but he was concerned about DC Water being able to meet all the historical requirements for building materials for the historic district. He asked if it would be more cost effective just to build the longer tunnel and forget GI all together because of the difficulties DC Water may have building GI in Georgetown.

Another guest asked if DC Water was coordinating with the Non-Motorized Boathouse project. JG1 responded that both projects are aware of each other and they would work together in their respective planning process as best they can.

A guest asked about the specific location of CSO 24's potential diversion chamber. JC responded that they did not know yet as they do not have any detailed design plans.

No other questions were asked. JG1 wrapped up the meeting by thanking everyone for attending.

The meeting was adjourned.

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Meeting Minutes
DC Water Clean Rivers Project
Potomac River Tunnel Consulting Parties Meeting

Meeting Information		Document Information	
Topic	Potomac River Tunnel	Edition	1st
Date	December 15, 2017	Revision Date	
Est. Start	10:00am		
Est. Finish	12:30pm		
Location	DCRA Room E200	Recorded By	EHT Traceries

Presenters
CR – Carlton Ray, DC Water
KD - Kim Daileader, EHT Traceries
BF - Brandon Flora, DC Water
JC - John Cassidy, DC Water
JG - Joan Glynn, Stantec
AM - Amanda Morgan, DC Water

Consulting Party Comments
CP – Consulting Party not individually identified
AL – Andrew Lewis, DC HPO
TL – Tom Luebke, Commission of Fine Arts
MF – Matthew Flis, National Capital Planning Commission (NCPC)
SP – Steve Plano (DC Department of Transportation)
RT – Dr. Ruth Troccoli, DC HPO
FL – Frederick Lindstrom, Commission of Fine Arts

Meeting Purpose
The purpose of the meeting was to provide consulting parties with an interest in the Section 106 process an overview of the Potomac River Tunnel project and the draft Areas of Potential Effect (APEs). The following is a summary of the comments and questions received from meeting attendees.

Slide 1: Presentation Overview
None.

Slides 2 and 3: Meeting Purpose and Goals
None.

Slides 4, 5, 6, and 7: Section 106 of the NHPA
None.

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Slides 8, 9, 10, and 11: Project Background
None.

Slides 12 and 13: Alternatives and Draft APEs, No Action
None.

Slides 14, 15, and 16: Alternatives and Draft APEs, Proposed Action Alternative
CP – Asked if each of the components will have a building above ground and a ventilation shaft.
BF – Responded that each component will have a shaft, but it will be entirely below ground. Except for the ventilation control facility, none of the other components would require a building.
CP – Asked if there will be general access at-grade to each component.
BF – Responded that at-grade access will be provided for maintenance that will consist of manholes, removable concrete slabs, etc., and noted most of the access points will be flush with grade.

TL – Asked if DC Water would revert to the original consent decree plan of constructing the tunnel to CSO 029 if GI is not feasible.
BF – Responded that the tunnel would stop at either CSO 024, 027, 028, or 029 depending on the practicability of GI. A gray option (tunnel) is being carried forward through compliance for each of the GI sewersheds just in case GI is determined not feasible.
TL – Expressed concerns that the practicability of GI in Georgetown is being assessed without knowing the effects to the historic district. Any determination about feasibility of GI is not realistic if the effects are not fully known.

Slide 17: Draft APEs, Proposed Approach
None

Slides 18 and 19: Component 1, Tunnel Corridor
CP – Asked if DC Water has considered the proposed alignment of the Georgetown-Roslyn Metro Tunnel that goes under the aqueduct bridge and pier abutment near CSO 028.
AM – Noted that DC Water holds regular meetings with WMATA and will coordinate closely regarding this and other WMATA projects.

Slides 20, 21, 22, and 23: Component 2, Mining Site
CP – Asked if the photos of the mining sites presented on slide 20 are representative of the construction area that would be needed for the CSO 024 diversion at 30th Street and K Street.
AM – Responded that the CSO 024 diversion would be at a much smaller scale then the mining sites for the Anacostia River Tunnel and the First Street Tunnel. The photos on slide 20 are reflective of the mining sites proposed at West Potomac Park.
BF – Included that the CSO 024 diversion would needed to be constructed in phases for maintenance of traffic.

CP – Asked if there will be a mining site at CSO 028 and if not, how would the tunnel boring machine (TBM) be removed.
AM – Stated that it may either be pulled back out of the tunnel or removed through a shaft. The mining site needs to be in the transitional zone between rock and soil as depicted on the presented underground stratigraphy illustration, and that further investigations would be undertaken to determine how the TBM would be removed once work is completed.

CP – Stated it would be helpful if the elevations of WMATA infrastructure were included on the underground stratigraphy illustration and included that the tunnel would be under at least two or three WMATA facilities.
AM – Pointed to the location of the WMATA tunnel on the underground stratigraphy illustration and responded that there would be a ten-foot clearance consisting of bedrock between the metro tunnel and the proposed elevation of the Potomac River Tunnel. The other two WMATA facilities along the Potomac River Tunnel alignment are above ground but DC Water is looking at how to deal with the piers of the railroad bridges.

CP – Asked if DC Water will use blasting to remove rock during construction.
AM – Responded that there may be some blasting in smaller areas to construct the adits (small tunnel connecting the Potomac River Tunnel to the shaft), but specific locations have not yet been determined.

TL – Asked what was depicted in blue on the underground stratigraphy illustration.
AM – Stated that the blue depicts a terrace deposit of gravel that could indicate a historic flow channel.
CP – Asked what street would be above the gravel deposit.
BF – Responded that it is in the vicinity of Virginia Avenue and Rock Creek and Potomac Parkway.

AL – Stated that the individual ground-level construction APEs made sense for direct effects, but they do not capture indirect or cumulative effects. Suggested one larger total project APE be defined that accounts for everything.
KD – Stated that one large APE was originally considered, but that the individual APEs were chosen because one large APE would not show in detail the ground level construction impacts.
AL – Acknowledged that the individual APEs are a good way to assess direct effects, but the larger, overall APE can also evaluate all indirect effects, including viewsheds and cumulative effects. The Assessment of Effects (AOE) should address direct, indirect, and cumulative effects.

Slides 24, 25, 26, and 27: Component 3, Emergency Overflow Structure

TL – Asked if the purpose of the overflow structure is to provide an outlet for the remaining 4% of overflows that the system cannot contain, as the current tunnel is designed to reduce 96% of CSOs entering the Potomac River.
JC – Responded that the capacity of the tunnel would not be infinite, so the overflow would be constructed for the events when the capacity of the tunnel system is exceeded.

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CP – Asked how the overflow structure would work when it is overtopped by flood waters from the Potomac River.
BF – Responded that there would be flood gates inside the structure to prevent water from entering the system.

CP – Asked if the overflow structure would be visible as a row of rectangles (referencing the outfall of an overflow structure as depicted on Slide 26) at CSO 022.
JC – Explained that DC Water has the flexibility to design the outfall of the structure in several ways, including replicating the existing seawall or constructing the openings of the overflow structure underwater.

MF – Noted that the proposed overflow structure at West Potomac Park may be visible from the George Washington Memorial Parkway and asked if this viewshed would be included in the APE.
KD – Responded that this viewshed is technically located within the APE and further stated that viewsheds from the George Washington Memorial Parkway are being considered.
AL – Added that this was another reason to have one, large APE that would cover indirect effects, including viewshed impacts from Virginia.

Slides 28, 29, 30, and 31: Component 4, Ventilation Control Facility
CP – Asked if a fan would be operational 24 hours a day.
BF – Responded that this facility would not be DC Water's primary approach to managing air within the tunnel system so the fans would likely not run continuously.

Slides 32, 33, and 34: Component 5, CSO 020 Control
FL – Clarified that the existing CSO regulator is located within a fully landscaped entrance plaza, and not a parking lot for the Institute of Peace as was stated during the presentation.
TL – Added that DC Water's aerial imagery is outdated and that more recent imagery should be used to reflect current conditions.

CP – Asked if General Braddock's landing marker is located near the CSO 020 Control Option 1 construction area. It was discussed that "Braddock's Rock" is actually located along the entrance ramp to the Roosevelt Bridge from Constitution Avenue across from Institute of Peace.

AL – Regarding Option 1, asked if this was within the Constitution Avenue ROW, and if there was potential to move it slightly to the south. Explained the long-term goal of reconnecting Constitution Avenue with the Belvedere, the historic terminus of the roadway.
BF – Responded that there is flexibility to move surface features, however, the diversion structure would need to be placed along the existing sewer.
AL – Asked how much would be located above-grade at this location.
BF – Responded that above-grade elements would include electrical cabinets.
JC – Stated that the electrical cabinets can be moved, and that there is a lot of flexibility regarding their final location.

CP – Asked if DC Water has been coordinating with the National Mall because a new underground Vietnam Veterans Memorial visitor center is proposed somewhere in the vicinity. Also, asked if project will be reviewed by NCPC.
BF – Responded that the proposed visitor center is not near the CSO 020 Control option locations.
KD – Added that NCPC is a consulting party and is present at the meeting.

Slides 35 and 36: Component 6, CSO 021 Control
None.

Slides 37, 38, and 39: Component 7, CSO 022 Control
TL – Stated that both options are located next to the proposed Ventilation Control Facility and Emergency Overflow Structure and asked if DC Water is considering combining one or more of these proposed elements.
BF – Stated that each of the options are being analyzed individually, but that DC Water is planning to consolidate structures wherever possible, which would benefit construction and reduce impacts.
TL – Commented that it is better to minimize construction-related impacts, especially along the waterfront.

Slides 40, 41, and 42: Component 8, CSO 024 Control
CP – Asked DC Water to consider placing this structure in the bowl roughly bound by 28th Street and Pennsylvania Avenue near the West Heating Plant.
BF – Responded that DC Water would consider this option, but suggested that because the site is upstream of the regulator, the CSO control would need to be designed to handle both wet and dry weather flows.
JC – Noted that this option would mean moving further away from the river, and DC Water would have to connect to several sewers with multiple structures that would require a substantial construction effort.
AL – Stated that the bowl location is very close to the C&O Canal, which would necessitate being cautious at that location to ensure the canal prism isn't effected.

FL – Asked if DC Water has coordinated with DDOT regarding their proposed Streetcar project and stated that the proposed location for the CSO 024 Control is also being proposed for a Streetcar maintenance facility.
KD – Responded that DC Water will coordinate with DDOT regarding the Streetcar and other projects, and that they are a consulting party present at this meeting.

TL – Stated that the Whitehurst Freeway may contribute to the Georgetown Historic District.
AL – Stated that a Determination of Eligibility was recently submitted to the DC HPO for the Whitehurst Freeway.
TL – Stated that the freeway was completed in 1949 and falls within the period of significance of the Georgetown Historic District (which ends in 1950) and therefore would have to be considered a contributing resource. Noted that the Historic District is a National Historic Landmark.

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Slides 43, 44, and 45: Component 9, CSO 027 Control

CP – Stated that there is a diversion structure on the Upper Potomac Interceptor near the proposed CSO 027 Control locations and asked how this will be addressed.
BF – Stated that DC Water may not need to do anything to the UPI as part of this project.

TL – Asked why some resources were identified on the Georgetown APE maps while others were not.
KD – Stated that these were individually listed resources that are significant in their own right and that contributing resources to the historic district were not individually called out.
TL – Suggested language to clarify this distinction.

Slides 46 and 47: Component 10, CSO 028 Control

CP – Asked if the CSO 028 Control would still be constructed if Green Infrastructure (GI) is implemented.
BF – Responded that GI would take the place of the tunnel and associated infrastructure for CSO 027, 028, and 029 if GI is determined feasible.

AL – Asked DC Water to explain the proposed disturbance at the site, describe the elevated structures that would be needed, and asked if the area around CSO 028 would have to be altered significantly in terms of grade and height.
BF – Responded that the trail elevation is at about 12 or 13 feet. Portions of the facility would need to be higher than that to protect from flooding and to account for the tunnel hydraulics. Noted DC Water and NPS are working closely together to find a solution that would minimize the impacts to the canal prism.

CP – Asked if something can be built overtop the diversion facilities, such as a boathouse.
BF – Stated that structures could be built on top of the facility as long as permanent access is maintained.

Slides 48, 49, and 50: Component 11, CSO 029 Control

None.

Slides 51 and 52: Component 12, Tunnel Connection to Existing Shaft at Joint Base Anacostia-Bolling

None.

Slides 53, 54, 55, and 56: Component 13, Green Infrastructure in Amended Consent Decree

TL – Stated he had an issue with DC Water deciding about the practicability of GI without analyzing the practicability of GI in Georgetown. Expressed an opinion that DC Water was making a one-sided evaluation for all the GI projects and that there is no way to make a comparison of the effects of GI versus no GI before it is specifically investigated within Georgetown. Stated he was not well versed in the technicalities of the Consent Decree, but felt there was something flawed in this decision-making process.
JC – Stated DC Water was committed to going through the process as outlined by the Consent Decree.
AL – Suggested that a Programmatic Agreement (PA) that spells out the process to comply with Section 106 may be the most appropriate path to address future preservation concerns regarding GI

implementation. Noted that he did not know the answer yet as to the best resolution, but that under Section 106, the development of a PA may be the most reasonable one. Stated that drafting an APE for GI is in some way acknowledging that it will be handled through the Section 106 process. Acknowledged that GI may not be implemented, but that APEs are about potential effects and therefore will always need to be included if GI is on the table as an alternative. Stated what is lacking is a process for how the GI projects in Georgetown would be reviewed.

JC – Responded that DC Water was not at that stage in the project yet, and that DC Water was still comparing green versus gray infrastructure.

AL – Responded that a PA would include this process, and that the document can create a process for further evaluation of potential effects once specific GI facilities are ready to be designed and reviewed in Georgetown, as well as other alternatives.

JC – Responded that DC Water will have to discuss with NPS what the final resolution document will be.

AL – Stated that DC Water will also have to discuss with DC SHPO about what that resolution document looks like. Development of a PA sounds like the most effective way to deal with it.

RT – Noted that a PA was developed for the Anacostia River Tunnel project.

CP – Asked if the 10-million-gallon expansion of the tunnel included CSOs 027 through 029.

JC – Responded that the tunnel would have to pick up CSOs 027 through 029 if GI is not practicable.

CP – Asked if the 10 million-gallon expansion was just for those three CSOs.

JC – Responded yes.

CP – Asked if it would take six years to construct the smaller projects (diversions, etc.,) or if that was the total project duration.

JC – Responded that the entire tunnel project would take approximately six years.

CP – Asked if all GI practicability projects would be completed in the next year or two.

JC – Responded yes.

CP – Asked if the study will show compliance with water quality standards.

JC – Stated that the study will measure the actual performance, but they have not yet collected that information.

CP – Asked why the presentation did not show renderings for GI and suggested it would help people to be able to envision what the facilities would look like.

JC – Responded that the presentation was for the tunnel undertaking and not for GI so renderings for GI were not included.

TL – Stated concern that everything regarding GI is being described in very general terms. The decision making seems to favor an analysis of performance in other parts of the city, and does not answer or account for the question of adverse effects in Georgetown. This is a problem because a decision regarding GI's impact to historic resources cannot be made just based on GI performance in other neighborhoods.

AL – Suggested the development of a PA is for this type of scenario. The PA could identify an approach to figure out which GI options would not have adverse effects to historic resources. Suggested

trying to refine GI approaches that would not have adverse effects, as well as a wider range of GI techniques. Noted that GI is being executed throughout the District by multiple agencies.

TL – Restated concern about effects not being accounted for in the GI practicability assessment.

AL – Responded that a PA does not decide an outcome but sets the path for consultation.

TL – Stated that Old Georgetown Board should be included in consultation.

Slides 57 and 58: Schedule

SP – Commented that a caveat should be added because saying "FONSI signed" is assuming that there will be no significant impacts.

JG – Responded that the project has been changed from an EIS to an EA and that DC Water is assuming a FONSI will be the appropriate decision document. Suggested that revising the schedule to "FONSI signed, if appropriate" would add the caveat suggested by SP.

CP – Asked if there will be formal proceedings with CFA and NCPC.

JG – Responded that the project will eventually need to go through the design review process.

KD – Stated that DC Water will need designs for specific GI facilities before the project would be reviewed by the Old Georgetown Board.

CP – Asked if it could be determined that the project is not appropriate during the design review process.

JC – Responded that this is what DC Water will determine through the practicability document.

CP – Asked if there will be an OGB proceeding, and, if so, when would it occur.

KD – Restated that the Old Georgetown Board cannot review theoretical GI, but would need concept or permit drawings sets to the review.

CP – Asked where the public can go to view the GI projects that are currently under construction.

KD – Responded that DC Water can organize a tour. Pointed to the areas in Burleith/Glover Park where the GI is going to be constructed as part of the practicability assessment.

CP – Asked if any of these areas were within the boundaries of a historic district.

AL – Stated they were not within a historic district but were near historic properties and that Traceries had submitted multiple DOEs for the project areas to assess the impacts to resources.

CP – Asked if DC Water will go to OBG before these GI elements are implemented.

KD – Responded no because they do not fall within the Georgetown Historic District, but are in Glover Park and Burlieth. OGB has no review authority over those areas.

AL – Stated that the GI that has been developed for these other areas of the District have been determined to have no adverse effects to historic properties and that these GI elements were ultimately not of concern to the public or DC SHPO.

CP – Regarding modification of Consent Decree, stated several different types of GI have been discussed. Asked that if once the project gained momentum, the process could be stopped along the way to evaluate.

JC – Responded that the project was on an aggressive schedule once a decision had been made, and there would be no opportunity to revisit. Stated that the 2030 Consent Decree deadline must be met.

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Slide 59: Questions

CP – Asked how to provide written comments.

JG – Responded to email Brett Schrader and that comments are requested by January 18th but that comments will be accepted throughout the process.

CP – Praised water quality improvements and significant benefits of the PRT plan.

CR – Thanked everyone for attending and concluded the meeting.

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Meeting Minutes
DC Water Clean Rivers Project
Potomac River Tunnel Consulting Parties Meeting

Meeting Information		Document Information	
Topic	Potomac River Tunnel	Edition	1st
Date	June 20, 2018	Revision Date	
Est. Start	1:00 pm		
Est. Finish	3:30 pm		
Location	DCRA Room E200	Recorded By	Stantec

Presenters
CR – Carlton Ray, DC Water
KD - Kim Daileader, EHT Traceries
BF - Brandon Flora, DC Water
JC - John Cassidy, DC Water
JG - Joan Glynn, Stantec
AM - Amanda Morgan, DC Water
PK – Paul Kreisa, Stantec

Consulting Party Comments
CP – Consulting Party not individually identified
AL – Andrew Lewis, DC HPO
TL – Tom Luebke, Commission of Fine Arts
DF – Dan Fox, Commission of Fine Arts
MF – Matthew Flis, National Capital Planning Commission (NCPC)
SP – Steve Plano (DC Department of Transportation)
RT – Dr. Ruth Troccoli, DC HPO
ES – Elsa Santoyo, Citizens Association of Georgetown
AS – Ann Satterthwaite, Friends of Georgetown Waterfront Park
LP – Lisa Palmer, ANC 2E Commissioner 2E05
JG2 – Joe Gibbons, ANC 2E, Chair, Commissioner 2E02
WH – Will Handsfield, Georgetown BID
TS – Tammy Stidham, NPS, National Capital Region
WG – Walter Groszyk, CAG

Meeting Purpose
The purpose of the meeting was to present consulting parties the findings of the Assessment of Effects on Historic Properties Report for the Potomac River Tunnel project. This is the third consulting parties meeting in the Potomac River Tunnel Section 106 process. The following is a summary of the comments and questions received from meeting attendees.

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Slide 1: Presentation Overview
None.

Slides 2 and 3: Meeting Purpose and Goals
None.

Slides 4 and 5: Section 106 of the NHPA
None.

Slides 6, 7, 8, and 9: Project Background
None.

Slides 10 and 11: Assessment of Effects, Adverse Effects
None.

Slides 12, 13, and 14: Component 1 – Tunnel Corridor
LP – Asked what determined the placement of the dotted line demarcating the limits of the tunnel portion of the APE and where it falls in relation to Georgetown.
KD – Responded that the demarcation was expanded north of the C&O Canal based on comments from the ANC following the previous consulting parties meeting.

CP – Asked if explosives would be needed to construct the tunnel and/or diversions due to shallow depth of bedrock and if the blasting would be disruptive.
AM – Stated that blasting would be needed to construct the diversions but would be approximately 60 feet below the ground surface and should not be noticeable. DC Water would comply with DCRA limits and guidelines for noise associated with this type of construction activity. Noise from blasting would be monitored closely at the surface. During blasting conducted recently at the Kennedy Center for construction of the CSO 021 diversion, adjacent properties stated that they did not realize that blasting had occurred.

Slides 15, 16, and 17: Component 2 – Mining Site
DF – Asked if there was flexibility with the design of the mining shaft and diversion structures to integrate at- and above-ground infrastructure into the landscape.
BF – Stated that it would depend on the structure, as some of the them, such as the mining shaft, would need to be placed overtop the tunnel. But there is a lot of flexibility with placement of the other structures. The project team will work with relevant stakeholders on the placement and design of at- and above-ground structures.
TL – Asked how large the access points would be and if the structures would be above grade.
BF – Said that access points would include typical 3-foot manholes and an approximately 12-foot x 12-foot opening with removable concrete slabs for maintenance access. They would not necessarily be above grade because they could be designed to be sealed. The access points would be much smaller than the actual structure.

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Slides 18, 19, 20, 21, and 22: Component 3 – Emergency Overflow Structure

AL – Asked if any of the trees along Independence Avenue SW would be impacted.
BF – Stated that for maintenance of traffic, DC Water is proposing an option to reroute Ohio Drive to a temporary intersection at Independence Avenue SW at Daniel French Drive SW. If this occurs, several trees along Independence Avenue SW would need to be removed but would be replaced following construction.
AL – Asked if this would create a new intersection.
BF – Responded that the connection point is already signalized.

CP – Asked if water flowing from the structure would be visible from the Potomac River.
BF – Responded that the overflow openings would be partially visible depending on the tide level. Due to the shallow water at the site, the structure cannot be fully submerged because it needs to be constructed out of the riverbed.

AL – Asked if trees could be planted on top of the overflow structure once it has been built.
JC – Responded that small trees could be planted on top of the structure like at CSO 019.
TL – Asked if these trees would be understory trees, which was confirmed. Suggested that trees the exist at the site are large mature trees so this would change the look and feel of the area.
LP – Suggested that the project team consider the application of roof gardens and tree wells like those used overtop underground parking garages.
BF – Responded that the project team would consider this.

RT – Stated that three ship hulls were discovered recently in Old Town Alexandria that were used as bulkheads to stabilize the land and asked if there is any potential for that at the CSO 022 location.
PK – Responded that there has been nothing in the research to indicate this has occurred at the CSO 022 location. If similar remains are discovered at this site it would be incidental. Additionally, the Programmatic Agreement (PA) will include an unanticipated discoveries clause to cover this type of discovery.

CP – Asked what would be constructed above ground and how large would the structures be for the overflow at CSO 022.
BF – Responded that most of the overflow is below ground; Above-ground structures would be elevated between 3 feet and 5 feet to get them above the floodplain. The dimensions of the above-ground infrastructure would be about 10 feet by 50 feet to maintain ventilation and provide protection for the ventilation equipment during floods.

AL – Asked if only one emergency overflow structure will be constructed.
BF – Stated that only one will be constructed.

CP – Suggested that future presentations and maps show the location of metro stations and tunnels.

LP – Asked if the yellow portions depicted on the map were all underground aside from the ventilation vault, which was confirmed.

CP – Asked how long construction would last at CSO 022.
BF – Stated that construction would take approximately 2 years.
CP – Asked when will the preferred option be decided and what will be the basis for the decision.
BF – Responded that the decision will be made through the NEPA and Section 106 compliance processes.

MF – Stated the Emergency Overflow Structure option at CSO 022 appears bigger than the others at West Potomac Park and asked if that was for a particular reason.
BF – Stated that the dimensions of the overflow are dependent primarily on hydraulics and the amount of space available. The West Potomac Park options were conceptually designed to integrate access openings into Ohio Drive to minimize visual impacts. The structure at CSO 022 is more confined due to the limitations of available land area.
TL – Asked if the seawalls at West Potomac Park and CSO 022 are different heights.
KD – Confirmed that the water is much deeper at CSO 022 and the seawall is higher in elevation than the seawall at West Potomac Park.
TL – Stated that perhaps there is an opportunity to construct the overflow at CSO 022 to bury it deeper, which would allow larger trees to be planted.

WH – Stated that there is a C&O Canal Plan under development that involves work along the canal from Mile Marker 0 to 1 in Georgetown. Asked if the project team was aware of it and if it is consistent with the design.
TS – Confirmed the project is consistent with the C&O Canal Plan.

CP – Asked what the quality of water will be that discharges from the overflow structure.
KD – Responded that the water quality will be improved from existing conditions.
JC – Added that the new tunnel will hold 200 million gallons of storage and would require large storm events to produce an overflow, which would in turn be largely diluted in comparison to current conditions.
RT – Asked how often an overflow could be expected.
BF – Stated that there would be an anticipated four overflow events in an average year.

CP – Asked what the timeframe is for the decision on the overflow structure location.
BF – Responded that a decision is expected by the end of the year.

<u>Slides 23 and 24: Component 4 – Ventilation Control Facility and UPIRS Diversion</u>
WG – Asked why a diversion is needed for the UPIRS.
BF – Responded that the diversion would allow connect the UPIRS to the Potomac River Tunnel to serve as a redundancy in the event the Potomac Pump Station goes offline. Flows in the UPIRS could be temporarily diverted to the tunnel until the pump station is brought back online.
LP – Stated an architectural firm should be contracted to design the above-ground portion of the ventilation control facility.
RT – Asked what the circular structure is south of the construction area.
KD – Responded that it is a ventilation shaft for the WMATA tunnel.

WG – Asked if a Native American burial ground is located within this site. Also, asked if the Peter House archaeological site is located at this location.
PK – Stated that a burial site had been identified further north of the site on the other side of the Whitehurst Freeway ramp to I-66. The Peter House is also in the area north of the ramp. Both are outside the limits of the construction area. However, the construction area does include registered archaeological site 51NW120, a limekiln that was identified during investigations conducted for the construction of the freeway ramp. Also, due to the long history of occupation of the area, there is potential for Native American sites to be present.

CP – Asked if any studies have been conducted to determine the extent of contamination in the area from the Washington Gas Light Company. Kennedy Center spent millions on remediation as a part of their expansion project. Suggested that a contamination survey be conducted for the area.
AM – Stated that DC Water is aware of contamination in the area and has initiated studies to determine the extent of the contamination.

WH – Suggested coordination with DDOT, since a 2003 DDOT study had been conducted to connect Rock Creek and Potomac Parkway to I-66 in the area.
BF – Said that the project team is in coordination with DDOT.
JG2 – Added that the project team should coordinate with Will Smith, the Chairman of Foggy Bottom.

Slides 25, 26, and 27: Component 5 – CSO 020 Control

TL – Stated that the CSO 020 Control option north of the Lincoln Memorial is a proposed location for a memorial.
AL – Stated that the CSO 020 Control option located at the Lincoln Memorial volleyball courts is preferable because it eliminates any conflicts with future siting of a memorial at the other location, and also avoids adverse effects to a potentially realigned Constitution Avenue reconnecting the Belvedere with Constitution Avenue.
AL – Asking about the potential removal of elm trees along Constitution Avenue.
KD – Responded that the construction area would not extend far enough north to require removal of the elm trees.

Slides 28 and 29: Component 6 – CSO 021 Control

TL – Asked what of the items depicted on the map have already been built and what is proposed.
BF – Stated that the structures depicted in green are the existing sewers and Potomac Pump Station, which was built in the 1960s, and the diversion structure and ventilation vault constructed in conjunction with the Kennedy Center expansion project. The blue area is the new eco-grove, which has not yet been built, and the orange structures depict the pavilions that are currently being built as part of the Kennedy Center expansion. For this project, DC Water would construct an underground connection, or "adit" between the tunnel and the drop shaft from the diversion structure. At the ground surface, DC Water would occupy the site temporarily to commission the structures.

Slides 30, 31, and 32: Component 7 – CSO 022 Control

None.

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Slides 33 and 34: Component 8 – CSO 024 Control and UPI Diversion

CP – Asked if any of the structures would be constructed above grade.
BF – Responded that the floodplain boundary generally follows along the buildings on the north side of K Street. The ventilation vault would need to be elevated a few feet above grade to set the top of the structure above the floodplain.
ES – Asked if it would be possible to place the ventilation vault north of the site in the area owned by DDOT.
BF – Stated that the proposed vault location is within the DDOT area.
TL – Stated that the graphic was difficult to understand.
BF – Explained that the proposed structures would be within K Street and 30th Street under the Whitehurst Freeway.
WH – Stated that DDOT is currently in the planning process for a potential streetcar along K Street and the site proposed for the ventilation vault is a potential site of a maintenance area. Also, stated that the Georgetown Gateway Project from Georgetown BID is planned for this area and may require coordination. There is a lot of interest in developing this area.
LP – Suggested that a hardscape design may be suitable for the site.
BF – Responded that a hardscape design could be a possibility and included that DC Water would coordinate with the various property owners on how the site is developed.

CP – Asked if the ventilation vault could be located further south within 30th Street NW.
KD – Said that the above-ground structures would need to be elevated even higher because the closer to the river the lower the site would be located within the floodplain.

CP – Suggested moving the structure to the northeast near the West Heating Plant property and the Four Seasons Hotel.
BF – Responded that moving the diversion to the north would mean that not all wet weather flows would be controlled, as several sewers connect to CSO 024 downstream of this area.
JC – Added that the placement of the CSO 024 Control was selected to meet water quality standards, as it is the only location where enough wet weather flows would be captured to meet the consent decree obligations and to minimize the amount of disturbance in the area.

CP – Asked if construction could be phased to minimize traffic during construction.
BF – Responded that a phased approach to construction would absolutely be implemented to allow for portions of K Street to remain open for through traffic.

RT – Asked if the yellow depicted on the map was cut and cover from the ground surface, which was confirmed.
DF – Added that the structures that would be visible above-ground should be identified for future presentations to help avoid confusion and understand the extent of these structures.

WG – Stated that the building at 30th Street and K Street houses the Saudi Armed Forces Office and suggested coordinating with them.

Slides 35, 36, and 37: Component 9 – CSO 027 Control

RT – Asked what depth is required to construct the drop shaft.
BF – Responded that the depth will be approximately be 20 feet to 30 feet.

LP – Asked the project team to study the possibility of moving the diversion structure onto Potomac Street NW to minimize impacts to K Street and/or Georgetown Waterfront Park.
BF – Responded that DC Water has investigated this possibility, but the road is too narrow to accommodate construction of the structure.
LP – Stated that Potomac Street NW is seldom used and urged the project team to consider it as a potential location for the structure by making it longer versus wider.
BF – Said that the structure will still need to connect with the river.
LP – Stated that a narrow trench could be dug to install the pipe to minimize impacts.

AS – Asked if the diversion structure and drop shaft would be above ground.
BF – Responded that the structure would be below grade except for the access area which would be above grade.
AS – Asked if the access would be large.
BF – Stated that the access would be elevated approximately 3 feet to 5 feet but there is flexibility in where it will be located and its dimensions.
TJ – Asked what the access is used for in general.
BF - Responded that the access is used for maintenance equipment access.

TL – Asked why the Georgetown Waterfront Park option includes a 30-foot shaft but the K Street option does not. Also, asked what drives the size of the shaft.
BF – The need for a shaft and its size are primarily determined by the movement of air and water at the particular location within the tunnel, but also to be large enough to allow for maintenance equipment access.

JG2 – Asked if the design changes, how would the consulting parties be notified and how would their input be considered.
KD – Responded that the design review process will be outlined in the Programmatic Agreement, which will be adhered to through construction completion.

LP – Stated that Green Infrastructure on the west side of Wisconsin Avenue will have a huge adverse effect on the National Historic Landmark District as a whole because the NHLD has a consistent appearance.
TL – Stated that for the diversion, these discussions are only needed for one site. For GI, imagine having these discussions 50 or 60 times for each site-specific GI measure.
ES – Added that using only green space in Georgetown for GI is highly objectionable and that a lot of people would be greatly affected.
CP – Stated that phased construction could address this issue.

RT – Stated that the CSO 027 sites will be a challenge from an archaeological standpoint, equivalent to when NPS planned the Poplar Point Pumping Station. The challenge is that investigations would require digging deep down to the soil layers where resources may be present.
PK – Added that investigations would require digging somewhere between 3 feet and 5 feet to reach these layers.
RT – Added that this could be an award wining project.

CP – Asked how much disruption is caused by an archaeological investigation.
PK – Responded that at CSO 027, 3 to 5 feet of fill would be removed by excavating trenches within the construction area at the structure locations where archaeological resources have been identified.
CP – Asked how much would need to be sampled.
PK – Stated that that will need to be discussed, but the idea is to limit the amount of machine trenching. These determinations will be made in consultation with DC SHPO and NPS.
ES – Asked if the archaeological investigations would occur before construction and if so, how long will the park be unusable.
PK – Stated that that has yet to be determined, but the investigations would occur within the construction area and trenches would be fenced for safety and then restored afterward. The trenches would be placed to avoid the hardscape, such as walkways. The investigation will require a trench that is 3 to 4 feet wide and 5 to 10 feet long. The trench will be fenced and will take multiple days.
ES – Asked if the trench will then be filled in before the actual work for the project begins, which was confirmed.
LP – Asked if the results of the archaeological investigation could be incorporated into an interpretive experience at the site if anything of interest is found.
PK – Stated that interpretation could certainly be considered as a mitigation measure.

CP – Asked if the project team has the funding to refurbish the park after the archaeological investigation.
CR – Responded that the project team does not have funds yet; no work would begin until funding is received.

WH – Asked if upgrading the existing pumping station would eliminate the need for the tunnel.
JC – Responded that the existing pipe sewers are not big enough to carry the amount of flow that needs to be captured. Also, existing capacity of the pumping station is also not large enough to handle the flow. These ideas were investigated in 1999 and were determined to be costlier and would cause a cascading effect that would be much more impactful.

Slides 38 and 39: Component 10 – CSO 028 Control
WG – Asked if the tunnel would end at the aqueduct bridge.
BF – Stated that it would be dependent on the GI practicability determination.
CP – Asked if DC Water is taking an all or none approach to implementing GI.
BF – Responded not necessarily.

CP – Asked how the timeline would be affected if archaeological investigations yield eligible resources.

PK – Said that all archaeological investigations would occur prior to construction. DC Water currently has a 5-year window for completing the investigations.
CP – Asked if it is possible to get the work done in the allotted time.
PK – Stated that the only potential complication is if the resources are located deep beneath the surface, in which case it would make sense to time the investigation with the construction work.

Slides 40 and 41: Component 11 – CSO 029 Control

CP – Asked what will happen to the tunnel boring machine once construction of the tunnel has been completed.
BF – Responded that it would depend on the final configuration, but the tunnel boring machine could either be pulled up and out of the mining shaft at CSO 029, which is currently designed to be big enough to accomplish or pulled back out through the tunnel to the mine shaft.

Slides 42 and 43: Component 12 – Tunnel Connection to Existing Shaft at JBAB

None.

Slides 44 and 45: Green Infrastructure

ES – Asked if the project team will assess effects to the Georgetown streetscapes, as they are character-defining features of the Georgetown NHLD.
KD – Responded that we cannot finalize adverse effects because the type, number, and location of structures for GI has not been determined yet.
LP – Stated that whether there are 5 structures or 100 structures, implementing would affect the uniformity of the streetscape, including paving, tree boxes, blue stone curbs, etc., that would have adverse effects on the NHLD as a whole.

JG2 – Stated that DDOT has plans to install new lighting within Georgetown which may limit the placement of potential GI and asked if DC Water was aware of the project.
BF – Said that this would be addressed as part of the constructability assessment during the GI practicability determination.

TL – Asked how the practicability of GI can be determined if the location, type, and number of structures is not known. Stated that you need to know what you are doing before you can make a decision. Continued that it cannot be done programmatically, and that DC Water is trying to separate the analysis from the undertaking.
JC – Said that, as per the consent decree, two projects in the Rock Creek and Potomac River sewersheds have been undertaken that will be used to determine practicability. These projects will undergo post-construction monitoring and a document will be prepared to determine if they are practicable. As part of the practicability determination, public acceptability, among others, is considered.
TL – Stated that this is not just a public acceptability issue but also a regulatory issue.

LP – Stated that practicability is not the only issue. What if DC Water cannot identify sufficient mitigation within the NHLD. Also, asked who would maintain the GI facilities, such as rain gardens,

if they were implemented. Various community groups maintain rain gardens in other areas of the District that are not kept up by DDOT.

WH – Suggested the use of roof/rain water capturing technology as an alternative to the GI measures proposed and encouraged DC Water to touch base.

RT – Asked if GI is not practicable, then the tunnel would be constructed to CSO 029.
BF – Responded that is correct and stated that the NEPA EA for the project analyzes the full-build scenario for the tunnel so that all bases are covered in the event GI does not move forward.

Slides 46, 47, and 48: Next Steps/Schedule/Questions
RT – Asked if the project will be design/build.
BF – Responded that it has not been determined.

RT – Asked if MOAs could be spawned from the PA.
JG – Responded that this could potentially be possible.
PK – Said that site-specific undertakings typically require an MOA.

AS – Asked what divisions of NPS are involved.
JG – Responded that C&O Canal NHP, Rock Creek Park, National Mall, and the National Capital Region have been involved.

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