STRAUGHAN
ENVIRONMENTAL
SERVICES, INC.

March 10, 2010

David Maloney, State Historic Preservation Officer
Office of Planning/Historic Preservation Office
2000 14th Street, NW 4th Floor
Washington, DC 20009

Re: DC WASA Long Term Control Plan, Anacostia River Projects

Dear Mr. Maloney:

The District of Columbia Water and Sewer Authority (DC WASA) plans to construct the Anacostia River Projects (ARP) to address the need to control combined sewer overflows (CSOs) along the Anacostia and Potomac Rivers in Washington D.C. The ARPs are one portion of WASA's Long Term Control Plan to control CSOs to the Anacostia and Potomac Rivers. The ARPs will divert wastewater and storm water overflows into underground storage and conveyance tunnels which will be approximately 20 feet in diameter and installed approximately 100 feet underground.

DC WASA is required to conduct Section 106 coordination because the Anacostia River Projects is a federally-sponsored undertaking that requires federal permits (such as a 404 permit). The project is being completed to satisfy the conditions of a 2005 EPA Consent Decree that mandates that DC WASA comply with the Clean Water Act, all applicable federal and local regulations, the terms of DC WASA's National Pollutant Discharge Elimination System (NPDES) permit, and to meet the objectives of the EPA's CSO Policy of 1994.

Straughan Environmental Services, Inc. (SES) has been contracted by DC WASA to undertake archeological and architectural investigations and to coordinate Section 106 review with the District of Columbia Historic Preservation Office and other consulting parties. The purpose of this letter is to present the steps that DC WASA and SES propose to take to evaluate the effects of the Anacostia River Projects on National Register listed or eligible cultural resources, obtain HPO's concurrence on our approach, and allow the HPO to comment on the approach and on anticipated project effects.

The ARP tunnel system will connect to the ground surface in nine areas referred to as Surface Disturbance Areas (SDAs). The SDAs are referred to as letters (Y, D, Z, G, I, B, E, F, and C) and represent areas within the project corridor where facility elements including tunnel shafts, diversion sewers, diversion chambers, and a new pumping station will be constructed along the east bank of the Potomac River and the east and west banks of the Anacostia River. These SDAs are shown in individual maps in **Attachment A**. Most facility elements will be located within areas that underwent extensive land

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filling 50-100 years ago and contain 5 to 25 feet of fill. A description of each facility element is included as **Attachment B.**

**Area of Potential Effects**

All project-related effects on cultural resources will occur within the nine SDAs. Although the underground tunnel system is extensive, it will be constructed underground and most elements are too deep (80-100 feet) to affect cultural resources.

For archeological resources, project facilities such as diversion sewers and chambers, shafts, and combined sewer outfalls are the only elements with the potential to disturb subsurface archeological resources because they extend into the first 40 feet of soils below the existing ground surface. The Area of Potential Effects (APE) includes the footprint of these facility elements and associated construction disturbance or staging areas.

The APE for the historic built environment is identical to that defined for archeological resources, and accounts for the potential for facility elements to physically or visually affect historic landmarks, districts, parks, or other historic resources. In general, other than the new pumping station depicted in Surface Disturbance Z in the Poplar Point vicinity, the visible, aboveground features of proposed facility elements will consist primarily of grates, manholes, and covered access panels. In areas in which combined sewer outfalls are being replaced, the new facility will be visually similar to existing sewer facilities.

In the sections below, SES presents SDAs in more detail, including cultural resources identified within or adjacent to each SDA and the potential for unidentified resources to exist. We also present our approach for evaluating potentially significant resources and determining whether the project would cause any adverse effects to resources.

**Archaeological Potential and Study Approach for each SDA**

Extensive dredging within the rivers and filling episodes along the river banks complicate the determination of archaeological potential within the project study area. SES reviewed a number of available resources to assist in the determination of archaeological potential at each surface disturbance area and develop an appropriate survey methodology. These resources include:

- coordination with the District Archeologist;
- archeological site and survey data;
- archeological survey reports;
- project-generated soil boring data;
- historic maps;
- as-built plans for facilities within each SDA (where appropriate and available).

Due to the depth of fill in each surface disturbance area, SES has chosen to employ a geoarcheologist (Daniel Wagner) to analyze Geoprobe soil cores from each accessible surface disturbance area with potential to contain resources and to assess the potential for each surface disturbance area to contain resources. For SDAs where geoarcheological borings indicate that there are intact land surfaces with the

potential to contain intact archeological resources, SES is in the process of developing a draft Phase I/II sampling strategy to identify and evaluate resources that may be encountered. Additional archival research, particularly to determine past land uses, is necessary to inform the sampling strategy. This research will be completed and presented to the HPO prior to undertaking the Phase I/II survey fieldwork.

SDA Y

SDA Y is located within an existing Digestion Facility at the Blue Plains Advanced Wastewater Treatment Plant. According to the 1907 Baist Real Estate Atlas, this area is located in the vicinity of the early 20th century shoreline. Further map research may clarify whether the SDA is located on fill overlaying river sediments or fill overlaying potentially intact land surfaces. As built plans of the Digestion Facility indicate that its foundations may not extend below the fill, indicating the potential for archeological resources if intact land surfaces exist below the fill layers.

Due to the presence of the existing digestion facility, geoarcheological borings and Phase I/II trenching cannot be completed in this location. SES proposes archeological monitoring during construction after the Digestion Facility is demolished.

SDA D

SDA D is located on Bolling Air Force Base, northwest of Ball Field #3, adjacent to the Potomac River shoreline. Comparison of 19th century and current maps indicate that this SDA is located within the land area of a former peninsula known as Giesboro Point. According to the Bolling Air Force Base Cultural Resources Management Plan (CRMP), this area is considered to have high potential to contain archeological resources (see **Attachment C**). This general area was a favorable location for prehistoric occupation, nearby to food resources and near important trade routes. A prehistoric camp (51SW3) is located in the general area. The Anacostan village of Natchotanke, described in 17th century by Jesuits and later by other explorers, is thought to be north of this SDA although its exact location is unknown, and ossuaries have been excavated approximately 0.5 miles to the south. Prior to the establishment of the District of Columbia, this area was in Prince George's County and was part of an 850-acre land grant named Giesborough originally owned by Thomas Dent. The land was developed as a tobacco plantation. A brick manor house was constructed in the vicinity of this SDA (in "Upper Giesborough") in the late 17th century, and enlarged in the early 19th century. Prior to the Civil War, the federal government appropriated Upper Giesborough, establishing an Army Cavalry Depot and a cavalry camp (Camp Stoneman). The Cavalry Depot Headquarters were located in the Giesboro Manor House. The CRMP's Archaeological Resources Sensitivity Map indicates that the Giesboro Plantation complex, including the manor house and a wharf, were partially located within this SDA.

SES proposes taking 8 continuous core soil samples in this area, which will be analyzed by geoarcheologist Daniel P. Wagner to determine the potential for intact archeological resources to exist in this location. Due to the anticipated depth of fill (15 to 20 feet), trenching will be necessary in Phase I/II to access any intact land surfaces identified in the soil cores. SES anticipates excavation of up to three 20' X 20' trenches and two 20' X 10' trenches, depending on the extent of intact land surface identified.

SDA Z

SDA Z is located on Poplar Point, south of DC WASA's Poplar Point Pumping Station, along South Capitol Street. Comparison of 19th to early 20th century maps and current aerial photographs indicates that this SDA is located within the land area formerly covered by Poplar Point, prior to extensive river dredging and filling episodes of the 19th and 20th centuries. The land within the APE has not been subject to subsurface survey, but previous archival research indicates that this area has high potential to contain resources. The area is considered to have high prehistoric archeological potential because it is in the vicinity of Stickfoot Branch, a former tributary of the Anacostia River. The marshy lowlands would have provided a source of riverine food resources. Historic maps and other documents indicate that by the early 19th century, John Barry owned all of the land on the Point and had likely established a tobacco farm. Structures, likely John Barry's residence and outbuildings, are shown on Poplar Point north of Stickfoot Branch in 1861. Later 19th and early 20th century maps such as the Hopkins and Baist Atlases indicate a road leading to the end of the point (Howard Road) with structures (likely residences) within the APE on Poplar Point's former, buried land surface.

SES proposes taking 18 continuous core soil samples in this area which will be analyzed by geoarcheologist Daniel P. Wagner to determine the potential for intact archeological resources to exist in this location. Due to the anticipated depth of fill (10 to 17 feet), trenching will be necessary in Phase I/II to access any intact land surfaces identified in the soil cores. Furthermore, due to the need to provide an engineer-certified CAD plan showing boring and potential trenching locations as a condition of the DDOT permit for this area, SES has already developed a trenching plan (Attachment C) that provides for the excavation of up to four 20' X 20' trenches and one 20' X 10' trench, depending on the extent of intact land surface identified.

SDA F

SDA F is located within Barney Circle, south of the intersection of K Street, SE and Pennsylvania Avenue. This is one of the few SDAs that was not subject to extensive land filling in the 20th century; but the area has been heavily disturbed by the construction of Pennsylvania Avenue, Barney Circle, the streetcar system in the late 19th century, and I-395/Southeast Freeway in the 20th century. Project-related construction disturbance within the SDA would occur primarily within the triangle of land between the exit ramp from westbound Pennsylvania Avenue to westbound Southeast Freeway, in an area that appears to be just inland of the 19th century shoreline. Because there is little if any fill in this area, any archeological resources would have been destroyed by the sub-grade construction of the highway.

Because there is no potential for resources, SES does not propose geoarcheological or Phase I/II investigations in this SDA.

SDA G

SDA G is within Anacostia Park, along the service road leading to the Park Police Heliport, and extends northeastward to the 11th Street Bridge. Early 20th century Baist Real Estate Maps indicate that the B&O railroad tracks were on the east riverbank prior to landfilling operations. Everything west of the track right-of-way, including the southern half of this SDA would have been within the river channel. The northern portion of the SDA (north of Good Hope Road) contains an indeterminate amount of fill above what has potential to be intact land surface. This area has high potential to contain prehistoric archeological resources and remnants of historic resources, such as structures shown on the 1861

Boeschke *Topographical Map of Washington* that were on the north side of the iron truss 11th Street Bridge that existed from 1875 until the mid-20th century, prior to the construction of the dual bridges that exist today (**Attachment D**). Any remnants of these structures, if not currently located underneath I-295/the Anacostia Freeway, are likely to exist on the north side of the existing alignment of Good Hope Road, which roughly follows the road (name unknown) that formed the southeastern approach of the 11th Street Bridge in the late 19th/early 20th century.

SES proposes taking 7-8 continuous core soil samples in this area, which will be analyzed by geoarcheologist Daniel P. Wagner to determine the potential for intact archeological resources to exist in this location. Due to the anticipated depth of fill (20 to 25 feet), trenching will be necessary to access any intact land surfaces identified in the soil cores. Due to the extent of made land in this area, SES anticipates excavation of one 10' X 20' trench south of the Park Police heliport (Attachment E).

SDA B

Surface Disturbance Area B includes two sub-areas underneath roadway and former roadway/rail surfaces along Tingey Street. The western sub-area is centered on the Tingey Street/4th Street SE intersection. From the center of the intersection, it extends for 100 feet north and 100 feet south underneath 4th Street SE, and 175 feet west underneath Tingey Street. Historic 19th and early 20th century maps indicate that both sub-areas were within an embayed portion of the Anacostia River until it was filled between 1872 and 1890. Neither sub-area, therefore, has any potential to contain intact prehistoric archeological resources. Historically, 19th and 20th century maps indicate that these areas have primarily been located beneath road or rail way surfaces. Soil boring logs indicate that the facility elements will be located within filled areas already disturbed by existing sewer infrastructure.

Because there is no potential for resources, SES does not propose geoarcheological or Phase I/II investigations in this SDA.

SDA I

Surface Disturbance Area I is located in the northern yard area of the Main DC WASA pumping station and partially extends underneath the Tingey Street roadway. Historic 19th and 20th century maps indicate that this area was within the area of the Washington Canal until it was filled during the late 19th century. Soil boring logs indicate 20 to 25 feet of fill in this area, with an additional layer of peat that is approximately 10 feet deep in some areas, particularly a few feet southwest of the shaft location. All boring logs in the vicinity of the planned facility elements indicate that fill extends below sea level, and that this area is made land with no potential for resources.

Because there is no potential for resources, SES does not propose geoarcheological or Phase I/II investigations in this SDA.

SDA E

Surface Disturbance Area E is located on the west bank of the Anacostia River at the eastern terminus of M Street, SE at Water Street. 19th and 20th century maps indicate that this area was near the Anacostia

River shoreline prior to extensive river dredging and filling episodes of the 19th and 20th centuries. Soil boring logs also indicate that fill is approximately 25-30 feet deep.

SES proposes taking 3 continuous core soil samples in this area which will be analyzed by geoarcheologist Daniel P. Wagner to determine the potential for intact archeological resources to exist in this location. Due to the anticipated depth of fill, trenching will be necessary to access any intact land surfaces identified in the soil cores. Due to the extent of made land in this area, SES does not anticipate excavation of more than one 15' X 15' trench. The trench would be located within the area of the 15' diameter shaft proposed for this area.

SDA C

SDA C is located on the west bank of the Anacostia River south of DC WASA's Northeast Boundary Swirl Facility, adjacent to the Anacostia River shoreline. Historic 19th and 20th century maps indicate that the central portion of this area was located within a western channel of the Anacostia River that was filled in the early 20th century. One prehistoric archeological site (51SE30) was identified in this surface disturbance area by Engineering Science during Phase II archaeological investigations at Barney Circle in 1989. The site was identified as a lithic scatter, and was considered to be of low enough significance that no further archeological investigations were warranted. Ruth Trocolli has noted that the results of subsequent Phase III investigations indicate the potential for historic cemetery remains in this general area.

SES proposes taking up to 10 continuous core samples in this area, which will be analyzed by geoarcheologist Daniel P. Wagner to determine the potential for intact archeological resources to exist in this location. Due to the anticipated depth of fill, trenching will be necessary to access any intact land surfaces identified in the soil cores. Due to the extent of made land in this area, SES does not anticipate excavation of more than one 20' X 20' trench.

The geoarcheological boring plans for SDAs D, Z, E, and G are located in **Attachment E**. The trenching plans for these SDAs are located in **Attachment F**. Boring and trenching plans have not yet been developed for SDA C, but will be shared with HPO when available.

**Historic Built Environment**

The location of historic structures, districts, and parks within each SDA were obtained from DC GIS data (publication date 2/01/2006). In December 2007, during pre-NEPA planning, HPO indicated that the Blue Plains Wastewater Treatment Plant (SDA Y) and the DC WASA Main Pumping Station (SDA I) were considered to be National Register-eligible resources. More recently, the HPO has provided SES with a draft National Register Nomination form for Anacostia Park, which indicates that the park is considered National Register eligible. In general, most facility elements are located within undeveloped areas, roadways, or open space and do not directly affect any structures. The visual elements associated with these SDAS include two combined sewer overflow facilities (SDAs D and C) and one pumping station (SDA Z). Other project facilities would be located entirely underground, with grates, manholes, and other similar access features a ground level.

SDA Y

SDA Y is located within the National Register-eligible Blue Plains Wastewater Treatment plant. The Digestion Facility that is currently within this SDA is being razed (as part of another project), and therefore has no potential to be affected by the shaft construction that is proposed for this area. No other historic structures or districts are located within the APE of this SDA.

The proposed shaft would be located below the existing grade. The only visible above ground elements would be access panels at ground level. Therefore, there is no potential to visually affect historic structures or districts outside the SDA.

Because there is no potential for adverse effects to the historic built environment at this SDA, SES does not propose any further architectural investigations in this area.

SDA D

SDA D is located in a largely undeveloped area within Bolling Air Force Base, approximately 300 feet north of the Bolling Air Force Base Historic District. There are no historic structures or districts within the APE of this SDA. The combined sewer overflow that will be constructed will be most visible from the Anacostia River, and will probably not be visible from the Historic District.

Because there is no potential for adverse effects to the historic built environment at this SDA, SES does not propose any further architectural investigations in this area.

SDA Z

SDA is located in a grassy area within and adjacent to the South Capitol Street/Suitland Parkway interchange. There are no historic structures or districts within the APE of this SDA. However, this SDA is adjacent to the Poplar Point Pumping Station, which is considered to be National Register eligible. This SDA will include also include a new pumping station.

The only potential adverse effect to the historic built environment involves visual effects of the new pump house design on the National Register-eligible Poplar Point Pumping Station. SES proposes sharing conceptual designs of the pumping station (once available) with the D.C. Historic Preservation Office, once available, so that HPO can review and comment on the design.

SDA F

SDA F is located within Barney Circle. Although Barney Circle once contained the turnaround for street cars along Pennsylvania Avenue, no remnants of the streetcar system remain. There are no historic structures or districts within the APE of this SDA. All project facilities will be located underground, and there is no potential for adverse visual effects to historic structures or districts beyond the SDA.

Because there is no potential for adverse effects to the historic built environment at this SDA, SES does not propose any further architectural investigations in this area.

SDA G

SDA G is located within Anacostia Park, and is located primarily underneath the roadway leading south from Good Hope Road to National Park Service Park Police Headquarters. Anacostia Park is the only National Register-eligible within (or partially within) the APE of this SDA, but there are no contributing structures within the SDA. Following construction, the project facilities will be entirely underground, and there will be no visual changes to park features.

Because there is no potential for adverse effects to the historic built environment at this SDA, SES does not propose any further architectural investigations in this area.

SDA B

SDA B is located underneath Tingey Street, with temporary construction staging areas in undeveloped areas north and south of Tingey Street. The APE of this SDA is located within the Washington Navy Yard Annex Historic District, but no structures or other contributing resources to the historic district would be affected. Following construction, the project facilities will be entirely underground, and there will be no visual changes to park features.

Because there is no potential for adverse effects to the historic built environment at this SDA, SES does not propose any further architectural investigations in this area.

SDA I

SDA I is located within the yard north of the DC WASA Main Pumping Station. The APE of this SDA contains a portion of the Washington Navy Yard Annex Historic District, and also contains the yard area of the Main Pumping Station, which is a National Register-eligible resource. There are no historic structures within the APE of this SDA; and following construction, all project facilities will be underground. Other than ground-level access panels and manholes, which are already visual elements within the area, there will be no visible facility elements.

Because there is no potential for adverse effects to the historic built environment at this SDA, SES does not propose any further architectural investigations in this area.

SDA E

SDA E is located in a primarily undeveloped area that was a portion of Anacostia Park until ceded to the District approximately one year ago. The area is traversed by M Street, Water Street, and the Anacostia Riverwalk Trail. There are no historic structures or districts within the APE of this SDA. All project facilities will be located underground, and there is no potential for adverse visual effects to historic structures or districts beyond the SDA.

Because there is no potential for adverse effects to the historic built environment at this SDA, SES does not propose any further architectural investigations in this area.

**Table 1. Historic Resource and Recommendation Matrix for Each Surface Disturbance Area**

| SDA | Description | Archeological Effects or Potential Effects | Proposed Survey Recommendation | Historic Architectural Resource Effects | Additional Coordination/Documentation? |
|---|---|---|---|---|---|
| **Y** | Blue Plains Wastewater Treatment Plant, Digestion Facility | Low; the site may be located on made land. | Archeological monitoring. | None. | No |
| **D** | Bolling Air Force Base | High. | 8 geoarcheological borings, up to 5 Phase I/II trenches. | None. | No |
| **Z** | Poplar Point | High. | 18 geoarcheological borings, up to five Phase I/II trenches | Visual Effects – Poplar Point Pumping Station | Yes – design review with HPO |
| **F** | Barney Circle | None. | None. | None. | No |
| **G** | Anacostia Park/vicinity of 11th Street Bridge | Low/Medium | 7-8 geoarcheological borings, up to one Phase I/II trench. | None. | No |
| **I** | DC WASA Main Pumping Station | Low | None. | None. | No |
| **B** | Tingey Street | Low | None. | None. | No |
| **E** | M Street at Water Street | Low | 5 geoarcheological borings, up to one Phase I/II trench. | None. | No |
| **C** | Anacostia Park/DC WASA Swirl Facility | Medium | 5 geoarcheological borings, up to two Phase I/II trenches | Physical and visual effects – Anacostia Park and Sea Wall | Yes – documentation of historic context and integrity to inform effects determination. |

SDA C

SDA C is located in an undeveloped area of Anacostia Park in the vicinity of the RFK Stadium Access Road and the DC WASA Swirl Facility. The combined sewer overflow facility would require removal of approximately 20 feet of the Anacostia Seawall, which is considered by NPS to be a contributing element to Anacostia Park. Anacostia Park is the only National Register-eligible resource that is partially within the APE of this SDA. The National Capital Planning Commission (NCPC) and Commission of Fine Arts have (CFA) expressed interest in the design of the combined sewer overflow facility, which will introduce a new visual element in the area.

SES will continue to assist with design review by the NCPC and CFA, and will complete additional research on the historic context and integrity of the seawall, if required by the DC HPO to inform the effects determination of the sea wall.

**Conclusions**

The table below summarizes our current research and our approach to addressing cultural resource concerns at the nine SDAs within the DC WASA Anacostia River Projects study area. SES proposes geoarcheological testing to assist in determination of archeological potential at five SDAs (D, Z, G, E, and C), and proposes follow up Phase I/II trenching at each SDA where the geoarcheology indicates that there is potential for resources. In addition, SES anticipates potential project-related effects to the historic built environment at two SDAs (Z and C).

SES appreciates your review of our proposed approach to addressing cultural resource effects of the Anacostia River Projects, and looks forward to your response to our approach.

We would like to suggest that if you prefer or find it more maneageable to provide comments or concurrence on our approach for each SDA in groups or individually, that some SDAs are under a tighter schedule for construction than others. DC WASA anticipates beginning construction in SDAs D, Z, and C earlier than in the other SDAs; therefore it may be most efficient to complete review of those SDAs first if that approach is agreeable to you.

Please contact me at 301-362-9200 or smichailof@straughanenvironmental.com if you have any additional questions about the Anacostia River Projects or the project effects on cultural resources.

Sincerely,

Sarah Michailof

Sarah Michailof
Cultural Resources Specialist

CC: Tim Dennee, Architectural Historian
Ruth Trocolli, District Archaeologist
David Campbell, Greeley and Hansen/DC WASA Program Consultants Organization

## Sarah Michailof

**From:** Trocolli, Ruth (OP) [Ruth.Trocolli@dc.gov]
**Sent:** Friday, March 26, 2010 6:17 PM
**To:** Sarah Michailof
**Cc:** Dennee, Timothy (OP)
**Subject:** RE: DC WASA construction permit

Sarah-
If needed we can prepare a Conditional No Adverse Effect form to accompany the WASA building permit application once we have reviewed the initiation letter and data you sent provided: 1) we agree with your approach for archaeology; 2) there aren't concerns for other resources; and 3) it is apparent the agency intends on fulfilling the conditions. It really shouldn't be a problem and there is a bit of time before they plan to get the permits.

I will review the information you submitted as soon as I can and get back to you with questions/ concerns. It would help my review to have the table of the locations you mentioned…oh yes!!!

Have a great weekend!
Ruth

Ruth Trocolli, Ph.D.
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http://planning.dc.gov/hp



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**From:** Sarah Michailof [mailto:SMichailof@straughanenvironmental.com]
**Sent:** Friday, March 26, 2010 2:32 PM
**To:** Trocolli, Ruth (OP)
**Subject:** DC WASA construction permit

Hi Ruth:

A couple of weeks ago, when we were discussing whether DC WASA could proceed with Phase I/II trenching during construction, you told me that the HPO would not sign off on the construction permit without archeology being complete. Can you cite where the regulatory authority is for HPO to require completion of archeology prior to construction? I've been looking in Chapter 5 of the District of Columbia Municipal Regulations: Title 10a Historic Preservation (on the HPO website). I'm not sure if I'm looking in the right place.

Thanks!

**Sarah Michailof**
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GOVERNMENT OF THE DISTRICT OF COLUMBIA
STATE HISTORIC PRESERVATION OFFICE

# DC STATE HISTORIC PRESERVATION OFFICE
# SECTION 106 REVIEW FORM

**TO:** Ms. Sarah Michailof, Straughan Environmental Services, Inc., 9135 Guilford Road, Suite 100, Columbia, Maryland
Michael Thorstenson, Greeley and Hansen LLC, Overlook Ave. SW, Washington, D.C.

**PROJECT NAME/DESCRIPTION**: DC WASA CSO Long Term Control Plan

**PROJECT ADDRESS/LOCATION DESCRIPTION:** Various Locations in Washington, D.C.

**DC SHPO PROJECT NUMBER: 10-103**

The DC State Historic Preservation Office (DC SHPO) has reviewed the above-referenced federal undertaking(s) in accordance with Section 106 of the National Historic Preservation Act and has determined that:

☐ This project will have **no effect** on historic properties. No further DC SHPO review or comment will be necessary.

☐ There are **no historic properties** that will be affected by this project. No further DC SHPO review or comment will be necessary.

☐ This project will have **no adverse effect** on historic properties. No further DC SHPO review or comment will be necessary.

☒ This project will have **no adverse effect** on historic properties **conditioned** upon fulfillment of the measures stipulated below.

☐ **Other Comments / Additional Comments** (see below):

Section 106 consultation for the WASA CSO project is ongoing, and geoarchaeological investigations are being conducted as the first phase of archaeological study. This finding of No Adverse Effect is conditioned on continued consultation with the DC SHPO regarding the archaeological investigations, completion of the as-yet-undefined plan of Phase I archaeological investigations and concurrence by the SHPO with the results of the study. The DC WASA Main Pumping Station and the Washington Canal (51SW007) are eligible resources, and details concerning their investigation have yet to be agreed on. The SHPO also expects to receive your research on the seawall in Anacostia Park, and that discussions with the National Park Service on minimizing visual effects to the park and efforts to modify the plans at the wall to limit the disturbance to only what is necessary will continue. Should unanticipated archaeological discoveries be encountered during any activity associated with this undertaking please contact Dr. Trocolli at 202-442-8836 or ruth.trocolli@dc.gov.

Ruth Trocolli

**BY**: _____ **DATE**: 30 April 2010

Ruth Trocolli, Ph.D.
State Historic Preservation Office Archaeologist

Geo-Sci Consultants, Inc.
*4410 Van Buren Street, University Park, Maryland 20782*
**tel: 301 277 3731** **fax: 301 277 2147**

# GEOARCHAEOLOGICAL INTERPRETATIONS

# OF SOIL CORE BORINGS

# AT THE CONTRACT DIVISION D LOCATION

# FOR PLANNED DCWASA SEWER IMPROVEMENTS

# AT BOLLING AIR FORCE

# WASHINGTON, D.C.

Submitted to
Straughan Environmental, Services, Inc.

By
Daniel P. Wagner, Ph.D.
Pedologist

March 22, 2010

## Introduction and Methods

The following is a discussion of observations and interpretations regarding the nature of soil materials examined at a location in the northwestern portion of Bolling Air Force Base in the Anacostia section of Washington, D.C. Investigations were directed toward the identification and characterization of any original land surfaces or other intact natural deposits that might once have been available for occupation and are now potentially preserved in buried contexts beneath introduced fill materials known to cover the area. Significantly, historical mapping provided by the Washington, D.C. Historic Preservation Office indicates that unlike much of the highly altered shoreline along the base, that near the study location closely approximates the original natural configuration. The obvious desirability of such a setting greatly increases the prospects for a record of occupation, which is known to regionally include both prehistoric and early historic components. This study's principal goal was therefore to determine whether any physical remains of that record might potentially still persist.

Investigation efforts entailed 8 mechanical Geoprobe borings that were distributed throughout the planned sewer structures consisting of diversion chambers roughly 175 ft from the Potomac River, an overflow and drop shaft facility near the river, and a connecting line between the two locations. Boring locations are shown on the accompanying may, and logs for the borings are attached at the end of the report. Log descriptions employ peodological designations for soil horizons and textural classes, as well as standard descriptive terminology such as Munsell color notations and USDA soil textural classes.

## Geology and Geomorphology

The study area is situated within the Coastal Plain Physiographic Province which is broadly characterized by variously textured, unconsolidated sediments derived both from marine and fluvial sedimentary regimes as well as more recent alluviation in association with modern stream valleys and drainageways. Although the study area is now closely situated to the shoreline and lies at an elevation of about 18 to 19 ft, both of these traits have changed with time due to both natural and made-made influences. Artificial filling has, of course, raised the surface elevation and partially altered the nearby shoreline, but natural processes have produced even more profound effects over the millennia.

As an overall characterization the landform of the project area can be described as a terrace along the Potomac River, but one so old that it has little relation to the present river system other than that it is contained within the same valley. Indeed, prior to the Holocene rise in sea level and drowning of the valley to form the existing tidal estuary, the original surface of project area landscape would have been considerably higher above the river than now exists. Possibly as high as 25 ft or more early in the Holocene, by the time of European settlement the height of the surface was likely about half as much.

Somewhat uniquely for this location, the position was always relatively close to the river channel even before tidal breaching of the main stem to form the broad Potomac estuary. Unlike many sections of the base where current shoreline locations were earlier in the Holocene many hundreds of feet from the pre-tidal river, the study location appears to never have been any more than about 200 ft from the river. Since existing bathometry places the main channel at about this distance, shoreline retreat due to bank erosion has been relatively modest along this stretch of the river. Hence, while much of the very early Holocene cultural record of shoreline occupations has likely been lost, the short distance suggests that fringes of such site areas could still be present. More complete representations should be expected for progressively later occupations.

## Results

Most of the study location has suffered considerable amounts of disturbance including both grading of the original landscape as well as varying amounts of filling. The most severe disturbances are in the vicinity of the diversion chambers (Borings 6, 7 and 8) where the typical fill thickness is on the order of 15 to as much as 20 ft. Beneath the fill are unweathered sediments that originally were at depths not only well below the natural land surface but also pedogenic subsoil levels which typically range to depths of 6 to 7 ft. The observed depth of landscape truncation extends nearly to sea level, indicating that as much as the upper 8 to 12 ft of original material was removed before filling occurred. With this degree of truncation no prospects remain for any cultural materials in the area of the diversion chambers.

Significant disturbances have also greatly modified the original landscape adjacent to the Potomac River in the vicinity of the drop shaft and access plates (Borings 1, 2 and 3). Truncation of the original landscape also occurred in this area prior to filling, although it was not as deep as at the locations of Borings 6, 7 and 8. Original surface and upper subsoil horizons are no longer present, but lower subsoil horizons (Bt or BC) still remain. Soil profile reconstructions from these remaining horizons suggest that landscape truncations on the order of 2 to 4 ft occurred before burial beneath 7 to 8 ft of fill.

Unfortunately, the above depths of truncation would still have accomplished complete destruction of any cultural deposits. This assessment arises from the apparent age of the site terrace, which likely reaches well into the Pleistocene. Not only does the regional geomorphology suggest such antiquity, but the advanced degree of development exhibited by the remnant argillic subsoil horizons (Bt) in the study area also evinces a Pleistocene origin likely predating even the earliest human occupation of the region. Accordingly, essentially the same land surface was utilized during all cultural periods, and any cultural materials would thus have been restricted to shallow levels associated with this surface. The observed degrees of soil truncation extending into or below the subsoil argillic horizons are sufficient to have destroyed any cultural deposits.

Modern disturbances along the central connecting line between the diversion chambers and the Potomac River have been less severe than elsewhere. In each of the two borings (Borings 4 and 5) on this line indications of the original surface horizons were present. At the location of Boring 4 the original surface horizon material appears to have been mixed with introduced fill materials. This mixing action also entailed some degree of truncation since the mixed zone (2C horizon) rests directly atop a relatively thin (~1 ft) argillic subsoil horizon, and there is also no intervening upper subsoil horizon (BE) that would normally be present. Probably graded and mixed to a depth of at least 1 ft and possibly as much as 2 ft, the soil retains little potential for intact cultural resources. However, given the relatively limited amount of disturbance compared with other locations, the possibility of a more intact land surface even within just a few feet of the boring location can not be discounted.

The above possibility of a mostly intact nearby surface beneath the fill was verified by Boring 5 where at about the same depth as the graded, mixed surface in Boring 4, an apparently mostly intact land surface was encountered. Shown in Figure 1, this surface at the depth of 6.5 ft could well be original, although it has undergone some alterations. The buried surface was almost surely formerly plowed, and it may also have been subjected to minor grading. The prospect of grading arises both from a concentration of small cinders near its base at the depth of 7.2 ft as well as from the absence of an underlying upper transitional subsoil horizon, which as stated above usually occurs between surface horizons and the argillic horizon. Such traits are, however, not altogether inconsistent with surfaces utilized during early historic periods, and a much thicker (2 ft) argillic horizon than that observed in Boring 4 suggests that if any grading occurred at this location its impact was likely minimal. There is also some possibility that the layer simply consists of fill material that happens to exhibit some surface horizon characteristics, but given its coincidental stratigraphic position as well as the thickness of the underlying solum (sequence of pedogenic horizons), the greater likelihood favors designation as the original surface horizon. In any event the uncertainty is hardly of an order sufficient to negate the potential for preserved cultural deposits of either prehistoric or early historic origins, and further archaeological scrutiny is warranted.

## Conclusions

The entire study location has been greatly altered from its original condition. Earthen fills ranging in thickness from 6.5 ft to as much as 19.5 ft form a surface mantle over all of the landscape. Additionally, prior to the filling most of the area had already suffered varying depths of grading and soil truncation that were for the most part sufficiently deep to destroy any cultural resources. Along a central line connecting riverside and landward limits of the study area grading disturbances were much less severe, and an apparently mostly intact buried surface at one location could well contain cultural materials of both prehistoric and early historic interest.

**Figure 1. The increment of the Boring 5 soil profile containing an apparently mostly intact original surface at the depth of 6.5 ft just below a large brick fragment. The surface had likely been plowed, and may also have undergone minor grading.**

## APPENDIX A

## Descriptions for Core Borings

| Depth (ft) | Pedologic Horizon | Characteristics |
|---|---|---|
| **Boring 1** | | |
| 0 - 7.4 | C | Mixed earthen fill with some rubble |
| 7.4 - 8.6 | 2Btb | Strong brown (7.5YR 4/6) sandy clay loam; soil truncated 2 to 3 ft |
| 8.8 - 11.0 | 2BCb | Strong Brown (7.5YR 4/6) fine sandy loam |
| 11.8 - 19.0 | 2C | Stratified strong Brown (7.5YR 4/6) fine sandy loam and yellowish brown (10YR 5/4) fine sand |
| 19.0 - 20.0 | 3C | Dark yellowish brown (10YR 4/6) very gravelly sand |
| **Boring 2** | | |
| 0 - 8.5 | C | Mixed earthen fill and cinders; brick at 6 ft |
| 7.4 - 10.0 | 2BCb | Strong brown (7.5YR 4/6) fine sand loam; soil truncated 3 to 4 ft |
| 10.0 - 19.5 | 2C | Stratified strong Brown (7.5YR 4/6) fine sandy loam and yellowish brown (10YR 5/4) fine sand |
| 19.5 - 20.0 | 3C | Dark yellowish brown (10YR 4/6) very gravelly sand |
| **Boring 3** | | |
| 0 - 8.2 | C | Mixed earthen fill and cinders with some brick |
| 8.2 - 9.0 | 2Btb | Strong brown (7.5YR 4/6) sandy clay loam; soil truncated 2 to 3 ft |
| 9.0 - 12.5 | 2BCb | Strong Brown (7.5YR 4/6) fine sandy loam |
| 12.5 - 19.5 | 2C | Stratified strong Brown (7.5YR 4/6) fine sandy loam and yellowish brown (10YR 5/4) fine sand |
| 19.5 - 20.0 | 3C | Dark yellowish brown (10YR 4/6) very gravelly sand |
| **Boring 4** | | |
| 0 - 6.5 | C | Mixed earthen fill with minor rubble |
| 6.5 - 7.4 | 2C | Graded and mixed truncated surface with brick chips |
| 7.4 - 8.5 | 2Btb | Strong brown (7.5YR 4/6) sandy clay loam; soil truncated 1 to 2 ft |
| 8.5 - 12.5 | 2BCb | Strong Brown (7.5YR 4/6) fine sandy loam |

| | | |
|---|---|---|
| 12.5 - 19.5 | 2C | Stratified strong Brown (7.5YR 4/6) fine sandy loam and yellowish brown (10YR 5/4) fine sand |
| 19.5 - 20.0 | 3C | Dark yellowish brown (10YR 4/6) very gravelly sand |

**Boring 5**

| | | |
|---|---|---|
| 0 - 2.5 | C | Mixed earthen and rubble fill |
| 2.5 - 6.5 | 2C | Brownish and grayish earthen fill |
| 6.5 - 7.2 | 3Apb | Brown (10YR 4/3) sandy loam; brick just above; mostly intact surface, but mixed with a few cinders |
| 7.2 - 9.2 | 3Btb | Dark yellowish brown (10YR 4/6) sandy clay loam |
| 9.2 - 12.5 | 2BCb | Strong Brown (7.5YR 4/6) fine sandy loam |
| 12.5 - 18.8 | 2C | Stratified strong Brown (7.5YR 4/6) fine sandy loam and yellowish brown (10YR 5/4) fine sand |
| 19.5 - 20.0 | 3C | Dark yellowish brown (10YR 4/4) very gravelly sand |

**Boring 6**

| | | |
|---|---|---|
| 0 - 4.5 | C | Mixed earthen fill with brick chips |
| 4.5 - 13.5 | 2C | Earthen fill, mainly very dark gray (2.5Y 3/1) heavy loam with some brick chips |
| 13.5 - 18.0 | 3C | Earthen fill, mainly brown (7.5YR 4/4) gravelly sandy loam |
| 18.0 - 19.2 | 4C1 | Dark brown (7.5YR 3/4) gravelly loamy sand |
| 19.0 - 20.0 | 4C2 | Olive brown (2.5Y 4/4) very gravelly sand |

**Boring 7**

| | | |
|---|---|---|
| 0 - 9.5 | C | Mixed earthen fill with some rubble and cinders |
| 9.5 - 19.5 | 2C | Earthen fill, mainly brown (7.5YR 4/4) gravelly sandy loam with organic layers |
| 19.5 - 20.0 | 3C | Olive brown (2.5Y 4/4) very gravelly sand |

**Boring 8**

| | | |
|---|---|---|
| 0 - 9.0 | C | Mixed earthen fill with some rubble and brick chips |
| 9.0 - 15.5 | 2C | Earthen fill, mainly brown (7.5YR 4/4) fine sandy loam and dark yellowish brown (10YR 3/4) loamy sand with some gravel |
| 15.5 - 19.0 | 3C1 | Brown (7.5YR 4/4) fine sand |
| 19.0 - 20.0 | 3C2 | Brown (7.5YR 4/4) loamy sand |

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# GEOARCHAEOLOGICAL INTERPRETATIONS

# OF SOIL CORE BORINGS

# AT THE CONTRACT DIVISION Z LOCATION

# FOR PROPOSED DCWASA SEWER IMPROVEMENTS

# AT POPLAR POINT

# WASHINGTON, D.C.

Submitted to
Straughan Environmental, Services, Inc.

By
Daniel P. Wagner, Ph.D.
Pedologist

April 26, 2010

## Introduction and Methods

The following is a discussion of observations and interpretations regarding the nature of soil and landscape stratigraphy within the proposed alignment for new sewer modifications Contract Division Z) that extend along a length of some 900 ft in the Poplar Point area of the Anacostia section of Washington, D.C. Investigations were directed toward the identification and characterization of any original land surfaces or other intact natural deposits that might once have been available for occupation and are now potentially preserved in buried contexts beneath introduced fill materials known to cover the area. Significantly, historical mapping provided by the District of Columbia Historic Preservation Office (Figure 1) indicates that the alignment location not only was originally much closer to the Anacostia River than present, but also spans the floodplain and adjacent land areas associated with a former stream known as Stickfoot Branch. The obvious desirability of such a river and stream confluence setting greatly increases the prospects for a record of occupation in both prehistoric and early historic time frames. This study's principal goal was therefore to determine whether any physical remains of that record might potentially still persist.

Investigation efforts entailed 18 mechanical Geoprobe borings that were distributed along the alignment of planned sewer as well as within an area for the construction of proposed pumping station at the southern end of the alignment. Boring locations are shown in Figure 2, and logs for the borings are attached at the end of the report. Surface elevations shown in the logs were estimated from the site topographic map, and rounded to the nearest half foot. Log descriptions employ peodological designations for soil horizons and textural classes, as well as standard descriptive terminology such as Munsell color notations and USDA soil textural classes.

## Geology and Geomorphology

The study area is situated within the Coastal Plain Physiographic Province which is broadly characterized by variously textured, unconsolidated sediments derived both from marine and fluvial sedimentary regimes as well as more recent alluviation in association with modern stream valleys and drainageways. The predominant geology of the regional uplands consists of the Lower Cretaceous age Potomac Group of sediments. These often fine-textured sediments rise to form the higher terrain along I 295 about a half mile southeast of the study location, and although they also underlie the project area at some depth, the original landform of the project area is a much younger terrace of Quaternary age. This terrace is all but continuous along the eastern side of the Anacostia from its downstream confluence with the Potomac River to upstream beyond where the river forks into its Northeast and Northwest Branches. Despite this clear association with the Anacostia valley, the terrace is not of the typical fluvial type built directly by out-of-channel flood events by the river. Rather, it is more related to Pleistocene cycles of sea


**Figure 1. The red line depicts the approximate location of the proposed sewer alignment relative to 1894 topography.**

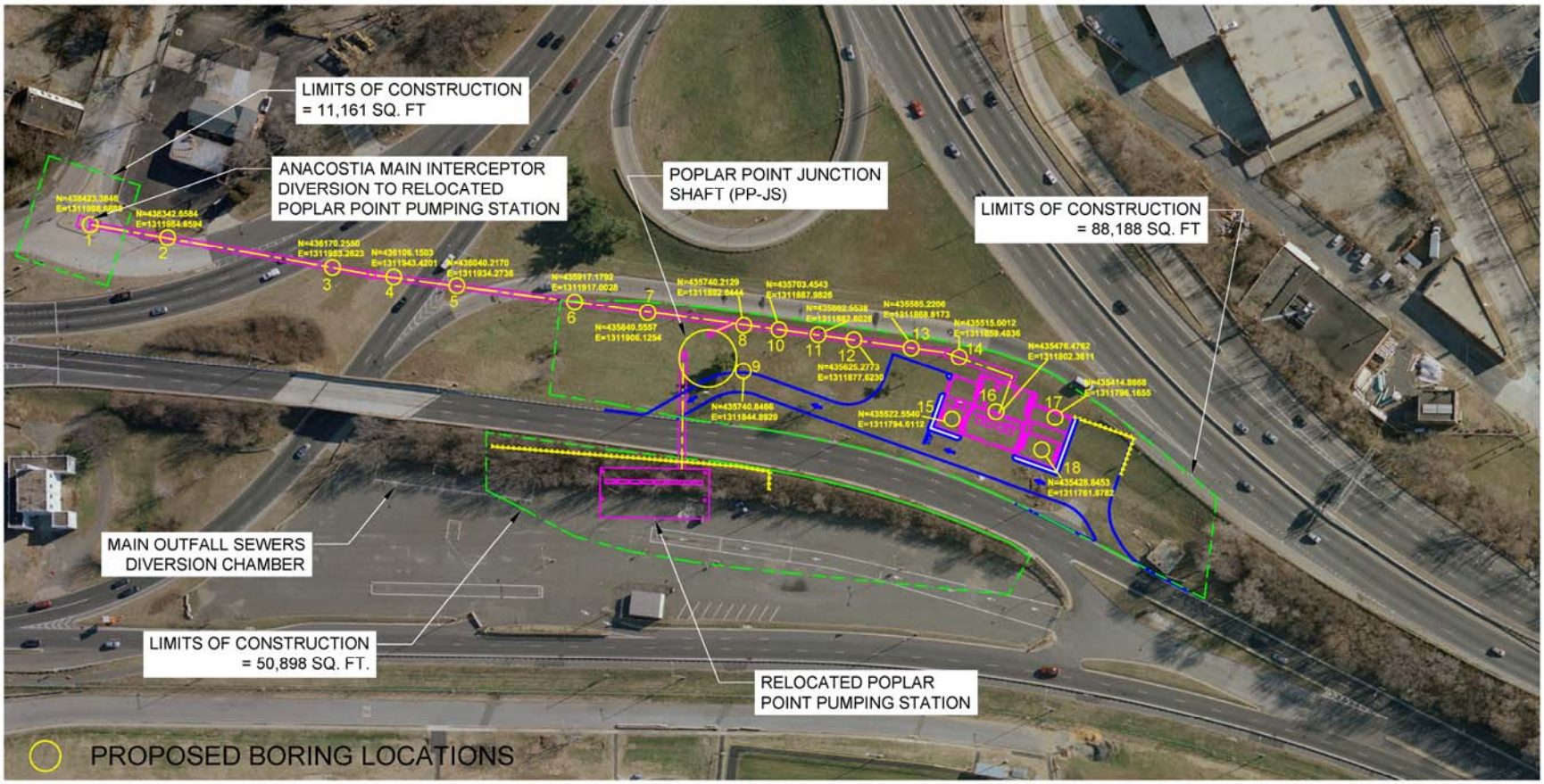


**Figure 2. Locations of soil borings starting in the north (left) and progressing to the southern pumping station (right).**

level fluctuations, and as such has its fundamental origin at a time likely well before the first humans arrived in the region. Nevertheless, it would not be unexpected for shallow surficial deposits of geologically much younger origins to occur as mantles atop the older basal material. These deposits variously derived from localized reworking or the erosional and depositional processes that are responsible for the topography of most Coastal Plain landscapes are typically of later Pleistocene or Holocene ages. In some instances such deposits can form a surficial rind of sufficient thickness to actually constitute the main soil parent material for a site; but even where relatively thin, it is in these variable surficial blankets that much of the archaeological record often resides.

In addition to the host of terrestrial processes that would have affected the project area over time, marine influences have also been formative. Indeed, prior to the Holocene rise in sea level and drowning of the valley to form the existing tidal estuary, the breadth and height of the terrace relative to the Anacostia River would each have been greater. Although several hundred feet of shoreline retreat is almost always the regional norm in response to rising sea level, the exact amount in the vicinity of the project area is now difficult to estimate due to extensive filling of the river as well as alterations in the channel bathometry by a combination of both dredging and greatly accelerated rates of historic sedimentation. Relative changes in the height of land above the river are more approachable, and based on typical curves for rates of sea level rise over the last quarter of the Holocene, the water has probably risen to a level at least 10 to 15 ft higher than that of the river's pre-tidal flow.

Historic modifications to the project location have, of course, also been extreme. Extensive artificial filling has dramatically altered surface elevations, produced a radically different shoreline configuration, and destroyed the former Stickfoot Branch. Although the proposed sewer alignment is now some 1,200 ft from the Anacostia River and is distributed across elevations ranging from about 10 to nearly 30 ft, none of the area's current topographic traits resemble those of the original site setting. In burying the area with 10 to as much as 25 ft of fill not only have elevations been appreciably raised, but the shoreline has also been extended outward several hundred yards. As shown in Figure 1 the Poplar Point name for the area reflects what once was a pronounced peninsula projecting several hundred yards from the mainland into the river. Indeed, the sewer alignment crosses much of this former peninsula, and is also within 300 to 400 ft of the former historic shoreline. Now deeply covered with fill materials, the original buried landscape was much lower in elevation, and as depicted in the Figure 1 map, apparently included a relatively broad riparian wetland at the mouth of the former Stickfoot Branch. Once a sizable stream with a large watershed ranging several miles into the interior, this drainageway and its associated wetland would have been enticing magnets for occupation.

## Results

As previously discussed the study location has been greatly modified from its original state. Deep mantles of historic earthen fills were identified in each of the borings, and ranged in thickness from about 10 to 15 ft in central and northern portions of the proposed sewer alignment to about 20 to 23 ft in the vicinity of the proposed southern pumping station. It is interesting that at a number of locations fill material actually extend to depths corresponding to elevations near or below sea level. These were mainly in central and northern portions of the sewer alignment (Borings 1, 2, 3, 4?, 5, 6?, 8, 9, 11, and 12) but also include one (Boring 18) at the southern extremity.

Two possibilities can account for fill materials extending to elevations at or below sea level. The usual case is that such areas represent made land where originally there was either open water or some type of tidal flat. From this it follows that a good deal of Poplar Point was already artificially made land even by 1894. Hence, fast land would have originally existed only in the southern part of the proposed alignment beginning somewhere between the location of Boring 12 and that of 13 where fill reaches only to about 5 ft above sea level. Furthermore, if the location of Boring 18 also represents made land atop former water or a tidal flat, then the boring location closely documents the former shoreline in this area as between it and that of Boring 17 where the bottom of the fill is about 9 ft above sea level.

The second possibility for fill extending to depths below sea level entails grading and soil truncation prior to filling. While this type of disturbance might be evoked for isolated locations, the widespread extent necessary for such a phenomenon at Poplar Point argues against it. Perhaps such grading affected only the locations of the three northernmost borings which should have been well within the fast land depicted on the 1894 map, but this would still mean that below sea level grading occurred across an unlikely distance of several hundred feet. A review of earlier historic mapping would hopefully shed light on these findings.

A portion of the originally low-lying area also presumably includes the floodplain of the former Stickfoot Branch. Dark colored, sandy or gravelly local alluvium with small brick chips was observed just below the fill at two locations (Borings 10, and 12), and such material would be consistent with deposits expected in a wetland floodplain. North of these boring locations the floodplain must have so gradually yielded to more tidal, riverine settings that the transition was not perceptible in the borings regimen. To the south, however, the wetland edge is readily defined between the location of Boring 12 where only stratified alluvial deposits are present beneath the fill and that of Boring 13 where a more favorably drained terrestrial soil is present.

The buried terrestrial soil at the location of Boring 13 was also encountered at the locations of Borings 14, 15, 16, and 17. Sandy in composition and distinctly different from

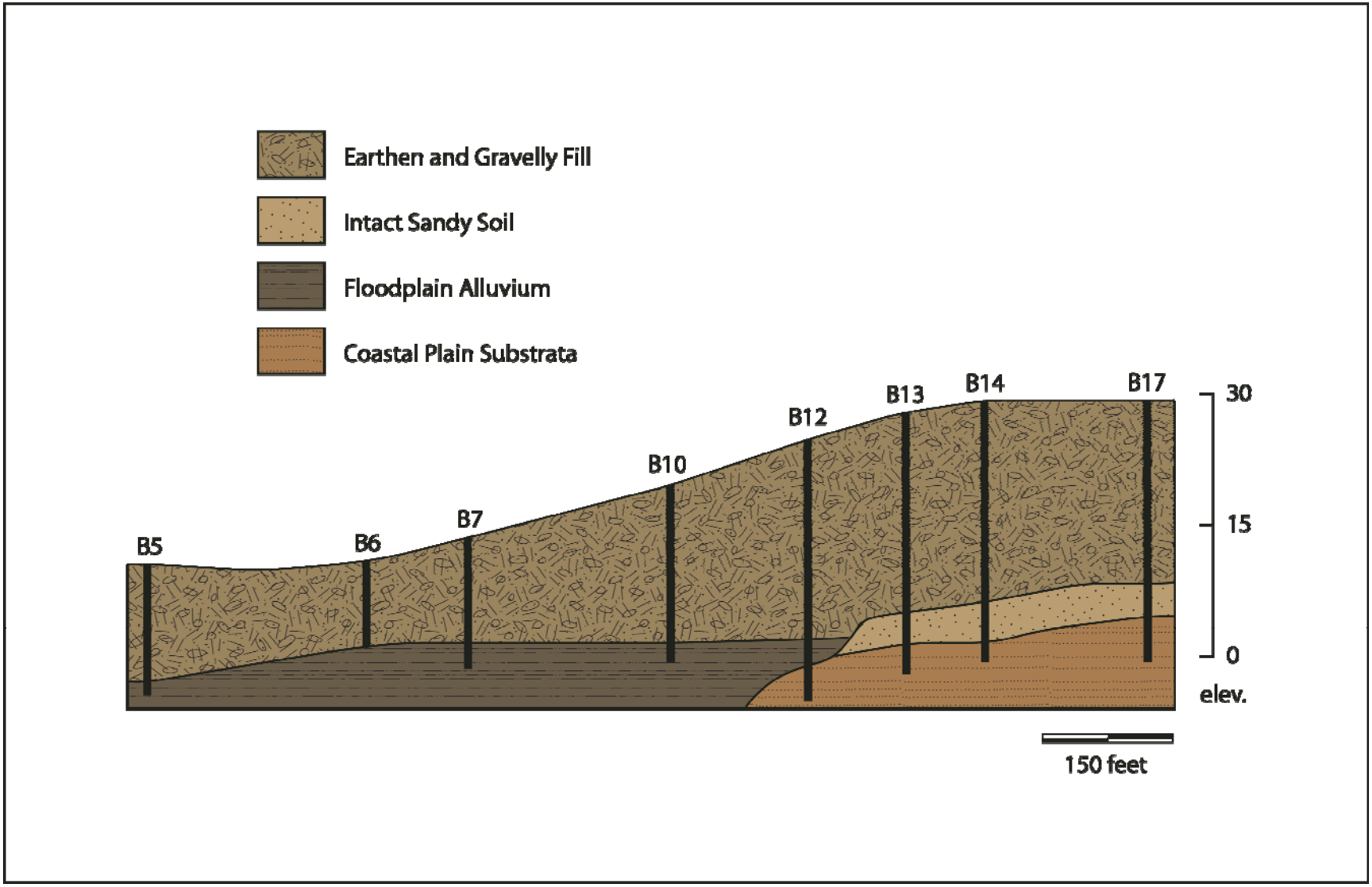


**Figure 3. Cross-section showing major stratigraphic units. The northern portion of the proposed sewer alignment is not shown since stratigraphy does not vary much past Boring 5.**

the overlying fill, the surface of the soil is about 22 to 23 ft below the modern surface, and ranges is elevation from a low of about 4.5 ft at the location of Boring 13 nearest the floodplain edge to a high of over 8 ft at the southernmost location of Boring 17. This height range demonstrates a slope gently rising away from the Stickfoot floodplain, and is consistent with normal landscape trends near drainageways. The rising surface of the buried soil as well as other major stratigraphic characteristics are shown Figure 3. Based on the height difference between the buried surface in Boring 13 and alluvial deposits in Boring 12, and within the context of what is most common for such landscape transitions in the region, the demarcation between the floodplain and adjacent land is depicted as a slight scarp.

Unlike what is often typical of land surfaces buried beneath fill, the sandy terrace soils at the southern end of the project, including the proposed pumping station area, were not subject to appreciable disturbances prior to or during filling. At two locations (Borings 13 and 14) the uppermost (2Ap1) of two stacked plow zones suggest either partial mixing with the fill or earlier over-thickening due to accumulations of historic slope wash, but otherwise the soils are intact. Indeed, even underlying upper transitional subsoil horizons (E, AE or BE) are present in all but the Boring 14 location where subsoil development is also somewhat different from the other locations. Such upper horizons in sandy soils are usually comparatively thicker than those of more medium-textured soils, and due to natural biotrubational processes are together with the surface horizon also included within potential cultural zones. As an example, a soil very similar to the buried soils at Poplar Point was recently (11/16/09) examined by this investigator in the Belleview section of Bolling Air Force Base (Site 51SW07) where a prehistoric ceramic vessel was recovered from the top of the E horizon just below the plow zone. Interestingly, a broken quartzite gravel was intercepted at the same level by Boring 15 of this study. This gravel is seen Figure 4 as well as in Figure 5 in which the profile of Boring 15 is shown along side the profiles of Borings 13, 16, and 17. The visible break in this gravel was made by the Geoprobe, but another break on the underside of the gravel was made long ago.

Subsoil development in all but the soil of Boring 14 is relatively advanced, and has achieved that of a mature argillic horizon. Even under the most favorable of circumstances for soil weathering such horizons require thousands of years to develop, and given the highly siliceous nature of the project area soils in which nearly inert sandy parent material would appreciably retard most soil genetic pathways, the observed argillic horizons undoubtedly mark soils of considerable age. Reworking of the uppermost layers during the Holocene by bioturbation or even eolian activity is certainly possible, but for the most part the soils document an early Holocene to Pleistocene age consistent with the likely origin of the terrace landform. Hence, the soils were long available for occupation and could contain lengthy cultural records.

**Figure 4. Increment of the Boring 15 profile showing the buried surface at the depth of 21.7 ft. The visible break in the gravel below the plow zone is due to sampling, but a much older break is on the underside.**

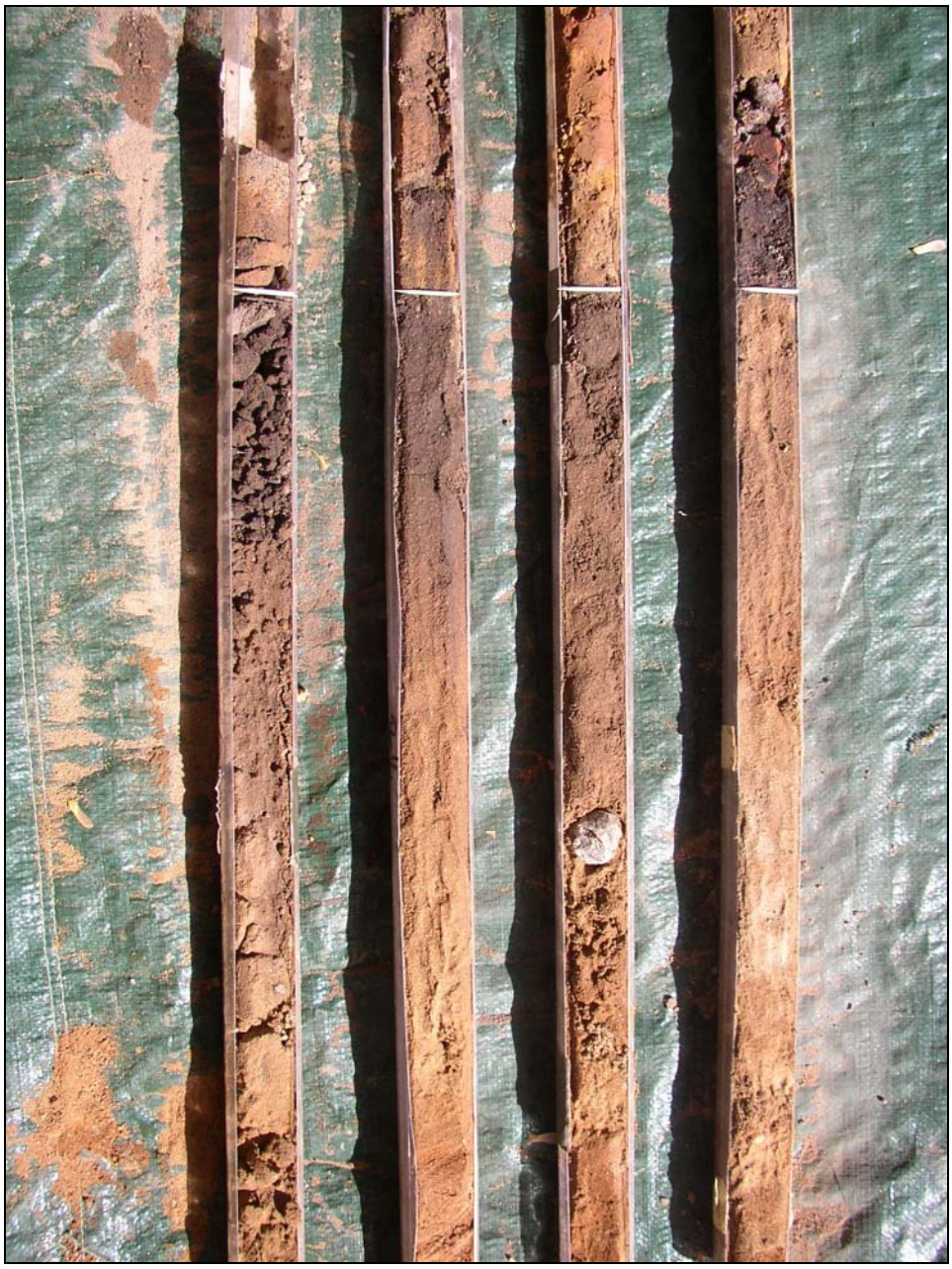

**Figure 5. Buried surfaces in, from left to right, Borings 17, 16, 15, and 13.**

## Conclusions

The examined borings reveal extensive alterations to the original Poplar Point landscape. Deep fill covers the entirety of the project area, and even extends to depths near or below sea level over about the northern two thirds of the area. This suggests that much of Poplar Point may already have been constructed as made land even before the topographic depiction of an 1894 map. In the central portion of the proposed sewer alignment the fill also buries the swampy floodplain of the former Stickfoot Branch, but the adjacent landscape beyond the southern edge of the floodplain is still well preserved beneath 22 to 23 ft of fill. Intact buried surfaces of a sandy terrace soil were found at several locations in this southern portion of the project area, and based on the degree of subsoil development in these soils a potential record of occupation could span the Holocene and reach into the Pleistocene.

## Descriptions for Core Borings

| Depth (ft) | Pedologic Horizon | Characteristics |
|---|---|---|
| **Boring 1 (Ele. 11.5 ft)** | | |
| 0 - 13.6 | C | Earthen and gravelly fill with some rubble, brick and cinders |
| 13.6 - 15.0 | 2C | Sandy local alluvium or fill; coal at 13.8 ft |
| **Boring 2 (Ele. 12.0 ft)** | | |
| 0 - 15.0 | C | Earthen and gravelly fill with some rubble; brick chip at 14.2 ft in a matrix of very dark gray (2.5Y 3/1) gravelly loamy sand with strong gasoline odor |
| **Boring 3 (Ele. 16.0 ft)** | | |
| 0 - 18.8 | C | Earthen and gravelly fill with some brick rubble |
| 18.8 - 20.0 | 2C | Strong brown (7.5YR 4/6) very gravelly sand; deep substrata or fill; poor recovery in 5-10 ft and 10-20 ft increments |
| **Boring 4 (Ele. 17.5 ft)** | | |
| 0 - 16.0 | C | Earthen and gravelly fill with some rubble |
| **Boring 5 (Ele. 11.0 ft)** | | |
| 0 - 13.3 | C | Earthen and gravelly fill with some brick rubble |
| 13.3 - 15.0 | 2Cg | Grayish brown (2.5Y 5/2), strong brown (7.5YR 5/6), and light gray (10YR 7/2) silty clay loam; clayey fill or deep substrata |
| **Boring 6 (Ele. 10.3 ft)** | | |
| 0 - 3.2 | C | Earthen and gravelly fill |
| 3.2 - 10.0 | 2C | Sandy and gravelly fill, mainly light olive brown (2.5Y 5/4) |

**Boring 7 (Ele. 13.5 ft)**

| | | |
|---|---|---|
| 0 - 7.5 | C | Earthen and gravelly fill |
| 7.5 - 11.5 | 2C | Sandy fill, mainly yellowish brown (10YR 5/6); brick chips at 9.6 ft |
| 11.5 - 15.0 | 3C | Yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) sandy alluvium with gravel lenses |

**Boring 8 (Ele. 18.5 ft)**

| | | |
|---|---|---|
| 0 - 17.5 | C | Earthen and gravelly fill with some rubble |
| 17.5 - 20.0 | 2C | Earthen fill with cinders and brick |

**Boring 9 (Ele. 24.0 ft)**

| | | |
|---|---|---|
| 0 - 24.0 | C | Earthen and gravelly fill with some rubble |

**Boring 10 (Ele. 20.0 ft)**

| | | |
|---|---|---|
| 0 - 18.3 | C | Earthen and gravelly fill |
| 18.3 - 20.0 | 2AC | Very dark gray (10YR 3/1) gravelly local alluvium with brick chips and cinders at top |

**Boring 11 (Ele. 22.5 ft)**

| | | |
|---|---|---|
| 0 - 22.0 | C | Earthen and gravelly fill |
| 22.0 - 24.6 | 2C | Grayish earthen fill with brick chips and cinders |
| 24.6 - 25.0 | 3C | Grayish earthen and gravelly fill |

**Boring 12 (Ele. 24.5 ft)**

| | | |
|---|---|---|
| 0 - 18.0 | C | Earthen and gravelly fill |
| 18.0 - 22.5 | 2Cg | Dark gray (2.5Y 4/1) silt loam possible dredged material; brick chips and cinders at base |
| 22.5 - 23.7 | 3AC | Dark grayish brown (10YR 4/2) sandy loam; few, very small brick chips in upper 0.4 ft; local alluvium |
| 23.7 - 24.7 | 3Cg | Grayish brown (2.5Y 5/2) sandy loam; local alluvium |
| 24.7 - 26.5 | 3C | Olive brown (2.5Y 4/4) silty clay loam; common, medium distinct mottles of dark grayish brown (2.5Y 4/2) |
| 26.5 - 30.0 | 4C | Brown (10YR 4/3) and dark yellowish brown (10YR 4/6) stratified sandy alluvium with some gravel |

**Boring 13 (Ele. 27.5 ft)**

| | | |
|---|---|---|
| 0 - 22.2 | C | Earthen and gravelly fill with some brick chips |
| 22.2 - 22.9 | 2Ap1b | Dark brown (10YR 3/3) and black (10YR 2/1) near base loamy sand; minor brick fragments; mixed horizon |
| 22.9 - 23.4 | 2Ap2b | Dark brown (10YR 3/3) loamy sand; original surface |
| 23.4 - 24.2 | 2E/Bb | Yellowish brown (10YR 5/4) loamy sand banded with dark yellowish brown (10YR 4/4) sandy loam |
| 24.2 - 25.3 | 2Btb | Brown (10YR 4/3) sandy clay loam |
| 25.3 - 25.6 | 2BCb | Strong brown (7.5YR 4/6) sandy loam |
| 25.6 - 30.0 | 3C | Yellowish red (5YR 4/6) and light gray (10YR 7/2) silty clay loam stratified with strong brown (7.5YR 4/6) sandy loam, yellowish red (5YR 4/6) loamy sand, and dark yellowish brown (10YR 4/6) loam |

**Boring 14 (Ele. 29.5 ft)**

| | | |
|---|---|---|
| 0 - 22.8 | C | Earthen and gravelly fill |
| 22.8 - 23.4 | 2Ap1b | Very dark grayish brown (2.5Y 3/2) sandy loam with cinders |
| 23.4 - 24.3 | 2Ap2b | Dark brown (10YR 3/3) loamy sand; original surface |
| 24.3 - 28.0 | 2Bwb | Dark yellowish brown (10YR 4/4) loamy fine sand and fine sandy loam |
| 28.0 - 29.2 | 3C | Reddish Brown (5YR 4/4) silty clay loam |
| 29.2 - 30.0 | 4C | Strong Brown (7.5YR 4/6) heavy sandy loam |

**Boring 15 (Ele. 26.5 ft)**

| | | |
|---|---|---|
| 0 - 21.7 | C | Earthen and gravelly fill with minor brick rubble |
| 21.7 - 22.6 | 2Apb | Very dark grayish brown (10YR 3/2) loamy sand; original surface |
| 22.6 - 22.8 | 2Eb | Yellowish brown (10YR 5/4) loamy sand; broken quartzite gravel at top |
| 22.8 - 23.2 | 2BEb | Dark yellowish brown (10YR 4/4) sandy loam |
| 23.2 - 24.7 | 2Btb | Brown (10YR 4/3) sandy clay loam |
| 24.7 - 26.0 | 2BCb | Yellowish red (5YR 4/6) heavy sandy loam |
| 25.6 - 30.0 | 3C | Yellowish red (5YR 4/6) and light gray (10YR 7/2) silty clay loam stratified with strong brown (7.5YR 4/6) sandy loam, yellowish red (5YR 4/6) loamy sand, and dark yellowish brown (10YR 4/6) loam |

**Boring 16 (Ele. 27.0 ft)**

| | | |
|---|---|---|
| 0 - 22.5 | C | Earthen and gravelly fill with minor brick rubble |
| 22.5 - 22.9 | 2Apb | Very dark grayish brown (10YR 3/2) loamy sand; original surface |
| 22.9 - 23.4 | 2AEb | Dark yellowish brown (10YR 3/4) loamy sand |
| 23.4 - 23.9 | 2Eb | Yellowish brown (10YR 5/4) loamy sand |
| 23.9 - 24.3 | 2Bt1b | Brown (10YR 4/3) sandy clay loam |
| 24.3 - 26.3 | 2Bt2b | Dark yellowish brown (2.5Y 4/4) sandy loam; common, medium distinct mottles of olive gray (5Y 5/2) |
| 26.3 - 30.0 | 3C | Yellowish red (5YR 4/6) and light gray (10YR 7/2) silty clay loam stratified with strong brown (7.5YR 4/6) sandy loam, yellowish red (5YR 4/6) loamy sand, and dark yellowish brown (10YR 4/6) loam |

**Boring 17 (Ele. 29.0 ft)**

| | | |
|---|---|---|
| 0 - 20.7 | C | Earthen and gravelly fill |
| 20.7 - 21.4 | 2Apb | Very dark grayish brown (10YR 3/2) loamy sand; original surface |
| 21.4 - 22.1 | 2AEb | Brown (10YR 4/3) loamy sand |
| 22.1 - 22.9 | 2BEb | Dark yellowish brown (10YR 4/4) sandy loam |
| 22.9 - 24.6 | 2Btb | Yellowish red (5YR 5/6) sandy clay loam; patchy clay films |
| 24.6 - 30.0 | 3C | Yellowish red (5YR 4/6) and light gray (10YR 7/2) silty clay loam stratified with strong brown (7.5YR 4/6) sandy loam, yellowish red (5YR 4/6) loamy sand, and dark yellowish brown (10YR 4/6) loam |

**Boring 18 (Ele. 22.5 ft)**

| | | |
|---|---|---|
| 0 - 24.5 | C | Earthen and gravelly fill |

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# GEOARCHAEOLOGICAL INTERPRETATIONS

# OF SOIL CORE BORINGS

# AT THE CONTRACT DIVISION E LOCATION

# FOR PLANNED DCWASA SEWER IMPROVEMENTS

# SOUTH OF M STREET

# WASHINGTON, D.C.

Submitted to
Straughan Environmental, Services, Inc.

By
Daniel P. Wagner, Ph.D.
Pedologist

May 5, 2010

## Introduction and Methods

The following is a discussion of observations and interpretations regarding the nature of soil materials examined at the location of proposed new sewer facilities along and south of M Street near the Anacostia River in Washington, D.C. Investigations were directed toward the identification and characterization of original land surfaces or other intact natural deposits that might once have been available for occupation and are now potentially preserved in buried contexts beneath introduced fill materials likely to cover the area. Much of the proposed sewer project is along previously disturbed upland areas beneath or adjacent to M Street, and this investigation entailed soil examinations between M Street and the river where available data were insufficient to demonstrate prior severe disturbance, and where proximity to a former shoreline suggested an enhanced potential for cultural resources.

Investigation efforts entailed 2 mechanical Geoprobe borings that were distributed along roughly 60 to 70-ft intervals south of M Street and approaching the Anacostia River. Three other borings were initially planed along M Street; however, as discussed above this portion of the study area was subsequently determined to be deeply disturbed. A map of the two boring locations together with logs for the borings are attached at the end of the report. Surface elevations given in the logs were estimated from a site topographic map. Log descriptions employ peodological designations for soil horizons and textural classes, as well as standard descriptive terminology such as Munsell color notations and USDA soil textural classes.

## Geology and Geomorphology

The study area is situated within the Coastal Plain Physiographic Province which is broadly characterized by variously textured, unconsolidated sediments derived both from marine and fluvial sedimentary regimes as well as more recent alluviation in association with modern stream valleys and drainageways. Regional uplands tend to have a rolling topography, and in the vicinity of the project area where there is no broad terrace landscape that is often present along the Anacostia River, upland terrain closely approaches the river. These uplands are formed mainly in sediments of Lower Cretaceous age. Identified as the Potomac Group of sediments, these ancient materials can be of variable composition, but commonly have textures of silty clay loam, clay, or silty clay. Although soils developed in the sediments tend to be reddish in color, lower, unweathered substrata often exhibit variegated colorations.

In contrast to the rolling uplands are the much more level and lower-lying alluvial landscapes that as discussed above are often present along Anacostia River. These are mainly terraces of Quaternary origin, and usually are of Pleistocene antiquities sufficient to predate human settlement of the region. Hence, although prospects for naturally buried

cultural resources are fairy limited, any such natural landform still at the surface or preserved beneath fill could well be expected to have a long record of occupation.

## Results and Conclusions

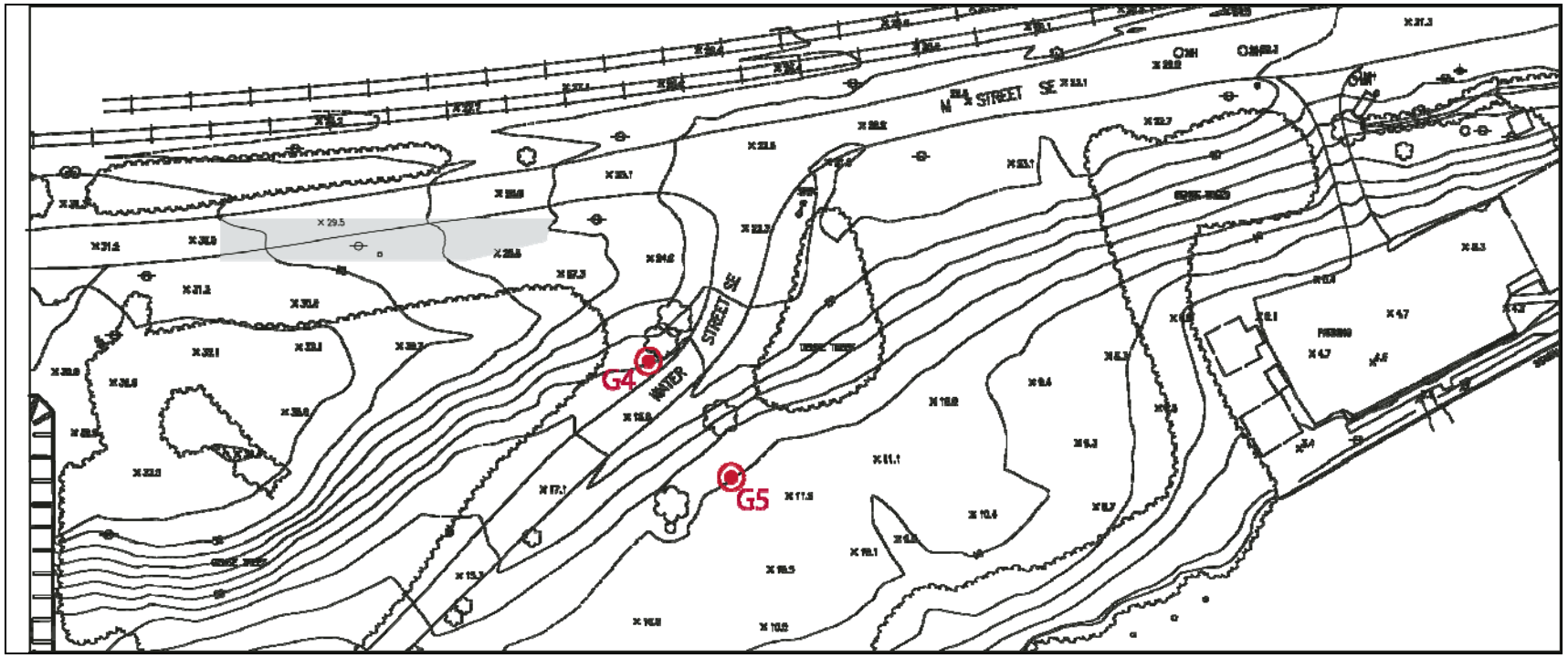
The two borings revealed markedly different stratigraphies consistent with the topographies of their respective locations. Surface mantles of earthen fills were present at each location, but both the thicknesses of the fill as well as the nature of underlying strata contrast two completely different original settings. At the location of Boring G4, which at the elevation of about 20 ft, is situated on a moderately declining slope roughly 10 ft below the level of M Street, earthen fill comprises the upper 5 ft. Below this depth Cretaceous clay strata typical of the regional uplands were intercepted. Although interpreted to be of natural origin, these clayey substrata had no associated original surface and did not exhibit any properties indicative of soil formation. Hence, these substrata would have been well below the level of the natural surface that originally existed at this location. Given the normal depth of soil formation for the region, this suggests that at least 4 ft of soil are likely to have been graded from the location before the covering mantle of fill was introduced. With this severe amount of truncation, any cultural materials that may once have been present would have been destroyed.

The nearly level terrace-like landscape on which Boring G5 is located is comprised of materials demonstrating an origin wholly unlike that of Boring G4. Reaching to the depth of 14 ft, the thickness of the surficial fill mantle is nearly three times that atop the higher, sloping landscape. Additionally, since the surface elevation at the Boring G5 location is only about 12 ft, it is apparent that the fill extends to about 2 ft below sea level. Even at this depth the underlying river alluvium contained a few brick chips indicating an historic age for the sediment extending another 2 ft to the maximum 16-ft depth of examination. These findings clearly indicate that the G5 location is made land where at one time open water of the Anacostia River was over 4 ft deep.

Although no prospects for intact cultural resources exist for this study area, the gathered data do nonetheless offer some insight about the original setting prior to historic modifications. Since the upland location of Boring G4 is only about 60 ft from the made land location of Boring G5, it follows that the original shoreline must have been somewhere in between. Given the 20-ft elevation of the G4 location together with the degree of slope across the upland, the shoreline was likely to have been much closer to G4 than G5. In fact, the greater likelihood is that no type of natural alluvial landscape existed in the area at all, and that the upland landscape of G4 plunged steeply into direct contact with the Anacostia River. Indeed, it was probably a retreating shoreline that in late prehistoric time was being undercut by the continually rising tidal waters of the river. That being the case, it is also possible that this eroding bank was too steep for occupation, and that any activities in the vicinity would have been confined to the more favorably sloping summit terrain along and landward of M Street.

## Descriptions for Core Borings

| Depth (ft) | Pedologic Horizon | Characteristics |
|---|---|---|
| **Boring G4 (Ele. ~20 ft)** | | |
| 0 - 5.0 | C | Earthen fill with minor stone |
| 5.0 - 12.0 | 2C | Variegated Cretaceous clay, mainly red (2.5YR 4/6) and light gray (10YR 7/1); soil severely truncated (>4 ft) |
| **Boring G5 (Ele. ~12 ft)** | | |
| 0 - 14.0 | C | Earthen fill with minor stone; brick chips and cinders at 7-8 ft; mostly clayey 8-9.5 ft; sandy loam below |
| 14.0 - 16.0 | 2Cg | Very dark grayish brown (2.5Y 3/2) gravelly loamy sand with a few brick chips; historic era river alluvium; poor retrieval |




**Map of Boring Locations**

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# GEOARCHAEOLOGICAL INTERPRETATIONS

# OF SOIL CORE BORINGS

# AT THE CONTRACT DIVISION G LOCATION

# FOR PROPOSED DCWASA SEWER IMPROVEMENTS

# AT ANACOSTIA PARK

# WASHINGTON, D.C.

Submitted to
Straughan Environmental, Services, Inc.

By
Daniel P. Wagner, Ph.D.
Pedologist

April 30, 2010

## Introduction and Methods

The following is a discussion of observations and interpretations regarding the nature of soil materials examined at the location of a proposed new sewer alignment in Anacostia Park just southwest of the 11th Street Bridge across the Anacostia River in Washington, D.C. Investigations were directed toward the identification and characterization of original land surfaces or other intact natural deposits that might once have been available for occupation and are now potentially preserved in buried contexts beneath introduced fill materials known to cover the area. A review of data from earlier borings made in the area indicated that positions close to the river consist of artificially made land where formerly inhabitable terrestrial surfaces could not be present. For this reason borings undertaken in this study were made only along that portion of the proposed sewer alignment farthest from the river where it was considered that the greatest likelihood for buried land surfaces might exist.

Investigation efforts entailed 7 mechanical Geoprobe borings that were distributed along the portion of the proposed sewer alignment discussed above. A map of boring locations and logs for the borings are attached at the end of the report. Surface elevations given in the logs were estimated from a site topographic map, and are rounded to the nearest half foot. Log descriptions employ peodological designations for soil horizons and textural classes, as well as standard descriptive terminology such as Munsell color notations and USDA soil textural classes.

## Geology and Geomorphology

The study area is situated within the Coastal Plain Physiographic Province which is broadly characterized by variously textured, unconsolidated sediments derived both from marine and fluvial sedimentary regimes as well as more recent alluviation in association with modern stream valleys and drainageways. Regional uplands which loom above the Anacostia valley nearly 1,000 ft southeast of the project area are dominated by Coastal Plain sediments of Lower Cretaceous age. These moderately rolling uplands are clearly distinguished from the nearly level and much lower lying landscape of the project area, which in form resembles a terrace that is extensive along the eastern side of the Anacostia River. However, with surface elevations across the examined segment of the sewer alignment ranging from no more than 6 ft to a maximum of 13 ft, and with the known presence of at least some amount of fill materials accounting for a good deal of this height, little vertical allowance remains for the possibility of a buried terrace landscape. Other studies along the river have found that elevations of the original terrace surface are typically at least 5 ft and often are in excess of 10 or 12 ft.

## Results and Conclusions

Consistent with the finding of nearby previous investigations, a variably thick mantle of introduced fill material was found to cover then entire study area. Ranging in thickness from about 7 to 12 ft, the fill consists of earthen and gravelly materials sometimes lying atop dark colored, silty dredged materials. With respect to most properties the dredged materials not surprisingly closely resemble the natural estuarine deposits from which they are largely derived. Indeed, designations as dredged material rest mainly on elevational distribution. Where such deposits occur at more than 1 or 2 ft above seal level, then natural origin above the high tide line is not possible. This was observed in the three northernmost borings (1, 2, 3) where such deposits were up to 7 ft above seal level. Similar deposits were also identified beneath earthen fills in the remaining four borings, but since the maximum elevations for silty materials in these borings were close to or below sea level, origins could be entirely due to natural sedimentation.

The northern and southern groups of borings also tend to be distinguished by differing types of substrata beneath the surface coverings of fill or dredged material. In the southern borings silty estuarine deposits extended to the full 20-ft depth of examination corresponding to elevations of 11 to 14 ft below sea level. This was also the case for Boring 3, but for Borings 1 and 2 sandy, stratified river alluvium was present at elevations near or just below sea level. In none the borings was there any evidence of a former terrestrial setting, and prior to filling the entire study area was either open water of the river or perhaps tidal mud flats. Accordingly, no prospects for buried cultural resources exist within the project area.

## Descriptions for Core Borings

| Depth (ft) | Pedologic Horizon | Characteristics |
|---|---|---|
| **Boring 1 (Ele. 13 ft)** | | |
| 0 - 6.0 | C | Earthen fill and gravelly fill |
| 6.0 - 12.0 | 2Cg | Very dark gray (5Y 3/1) silt loam; probable dredged estuarine material |
| 12.0 - 20.0 | 3C | Brown (10YR 4/3) and dark grayish brown (10YR 4/2) stratified sandy loam, loamy sand, and sand; river alluvium |
| **Boring 2 (Ele. 10 ft)** | | |
| 0 - 6.0 | C | Earthen and gravelly fill |
| 6.0 - 12.0 | 2Cg | Very dark gray (5Y 3/1) silt loam; probable dredged estuarine material |
| 12.0 - 19.0 | 3C | Brown (10YR 4/3) and dark grayish brown (10YR 4/2) stratified sandy loam, loamy sand, and sand; river alluvium |
| 19.0 - 20.0 | 4C | Light brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/6) silty clay; Cretaceous substratum |
| **Boring 3 (Ele. 9 ft)** | | |
| 0 - 6.5 | C | Earthen fill and gravelly fill |
| 6.5 - 25.0 | 2Cg | Very dark gray (5Y 3/1) silt loam with some fibers below 10 ft; probable dredged material atop estuarine sediments |
| **Boring 4 (Ele. 9 ft)** | | |
| 0 - 6.8 | C | Earthen fill and gravelly fill |
| 6.5 - 20.0 | 2Cg | Very dark gray (5Y 3/1) silt loam with some fibers and sandy lenses; probable dredged material atop estuarine sediments |

**Boring 5 (Ele. 8 ft)**

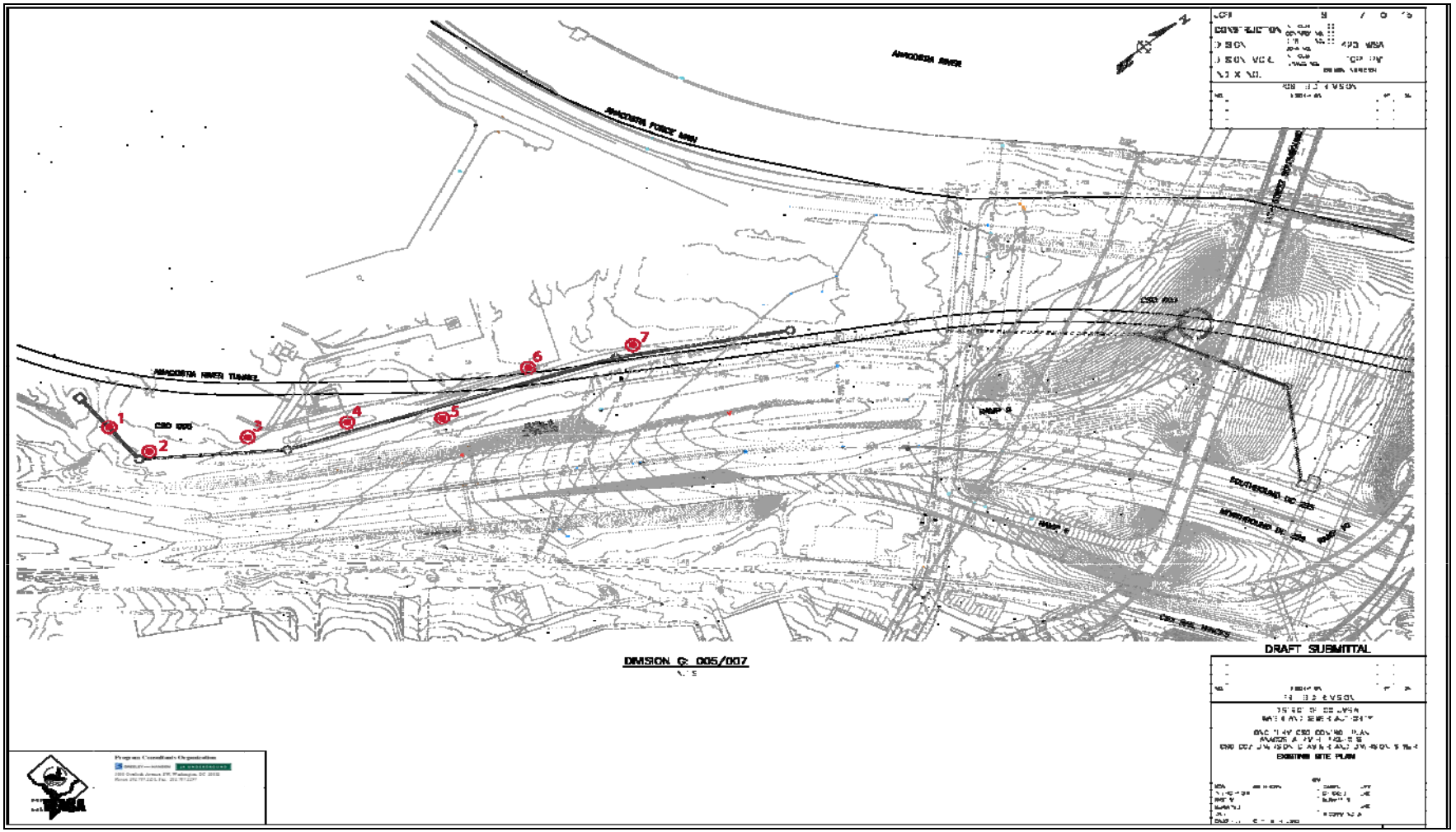
| | | |
|---|---|---|
| 0 - 7.0 | C | Earthen fill and gravelly fill; poor retrieval |
| 7.0 - 20.0 | 2Cg | Very dark gray (5Y 3/1) silt loam; dredged material or estuarine sediments |

**Boring 6 (Ele. 7 ft)**

| | | |
|---|---|---|
| 0 - 7.5 | C | Earthen fill and gravelly fill with brick |
| 7.5 - 25.0 | 2Cg | Very dark gray (5Y 3/1) silt loam; estuarine sediments |

**Boring 7 (Ele. 6 ft)**

| | | |
|---|---|---|
| 0 - 10.0 | C | Earthen fill and gravelly fill with concrete; poor retrieval |
| 10.0 - 20.0 | 2Cg | Very dark gray (5Y 3/1) silt loam; estuarine sediments |




**Map of boring locations at Anacostia Park**

Geo-Sci Consultants, LLC

*4410 Van Buren Street, University Park, Maryland 20782*

**tel: 301 277 3731** **fax: 301 277 2147**

# GEOARCHAEOLOGICAL INTERPRETATIONS

# OF SOIL CORE BORINGS

# AT THE CONTRACT DIVISION C LOCATION

# FOR PLANNED DCWASA SEWER IMPROVEMENTS

# NEAR D.C. GENERAL HOSPITAL

# WASHINGTON, D.C.

Submitted to
Straughan Environmental, Services, Inc.

By
Daniel P. Wagner, Ph.D.
Pedologist

May 6, 2010

## Introduction and Methods

The following is a discussion of observations and interpretations regarding the nature of soil materials examined at the location of proposed new sewer facilities near the Anacostia River south of the D.C. General Hospital in Washington, D.C. Investigations were directed toward the identification and characterization of original land surfaces or other intact natural deposits that might once have been available for occupation and are now potentially preserved in buried contexts beneath introduced fill materials known to cover much if not all of the area. Because early historical mapping and previous nearby boring examinations indicate that most of the study location closest to the river is artificially made land formed in fill, borings were located only near the landward limit of the impact area where prospects for intercepting natural land were considered the greatest.

Investigation efforts entailed 2 mechanical Geoprobe borings made roughly 50 ft apart at the western end of the study area. Since severe disturbances were known to exist at the far western extremity of the area, the outermost 50 ft was avoided. A map of the boring locations together with logs for the borings are attached at the end of the report. Surface elevations given in the logs were estimated from the site topographic map. Log descriptions employ peodological designations for soil horizons and textural classes, as well as standard descriptive terminology such as Munsell color notations and USDA soil textural classes.

## Geology and Geomorphology

The study area is situated within the Coastal Plain Physiographic Province which is broadly characterized by variously textured, unconsolidated sediments derived both from marine and fluvial sedimentary regimes as well as more recent alluviation in association with modern stream valleys and drainageways. Regional uplands tend to have a rolling topography, and in the vicinity of the project area where there is no broad terrace landscape that is often present along the Anacostia River, terrain of a clearly upland nature approaches to within 200 ft of the river just south of the project area. Local uplands are formed mainly in fine-textured sediments of Lower Cretaceous age, although deposits of much later origin often form thin surficial mantles atop these ancient sediments.

More level and lower-lying alluvial landscapes are often present along the Anacostia River. These are mainly terraces of Quaternary origin, and usually are of Pleistocene antiquities sufficient to predate human settlement of the region. Hence, although prospects for naturally buried cultural resources are fairy limited, any such natural landform still at the surface or preserved beneath fill could well be expected to have a long record of occupation. A relatively narrow terrace-like landscape does occur within the project area, but as discussed above has been previously shown to be artificially made land.

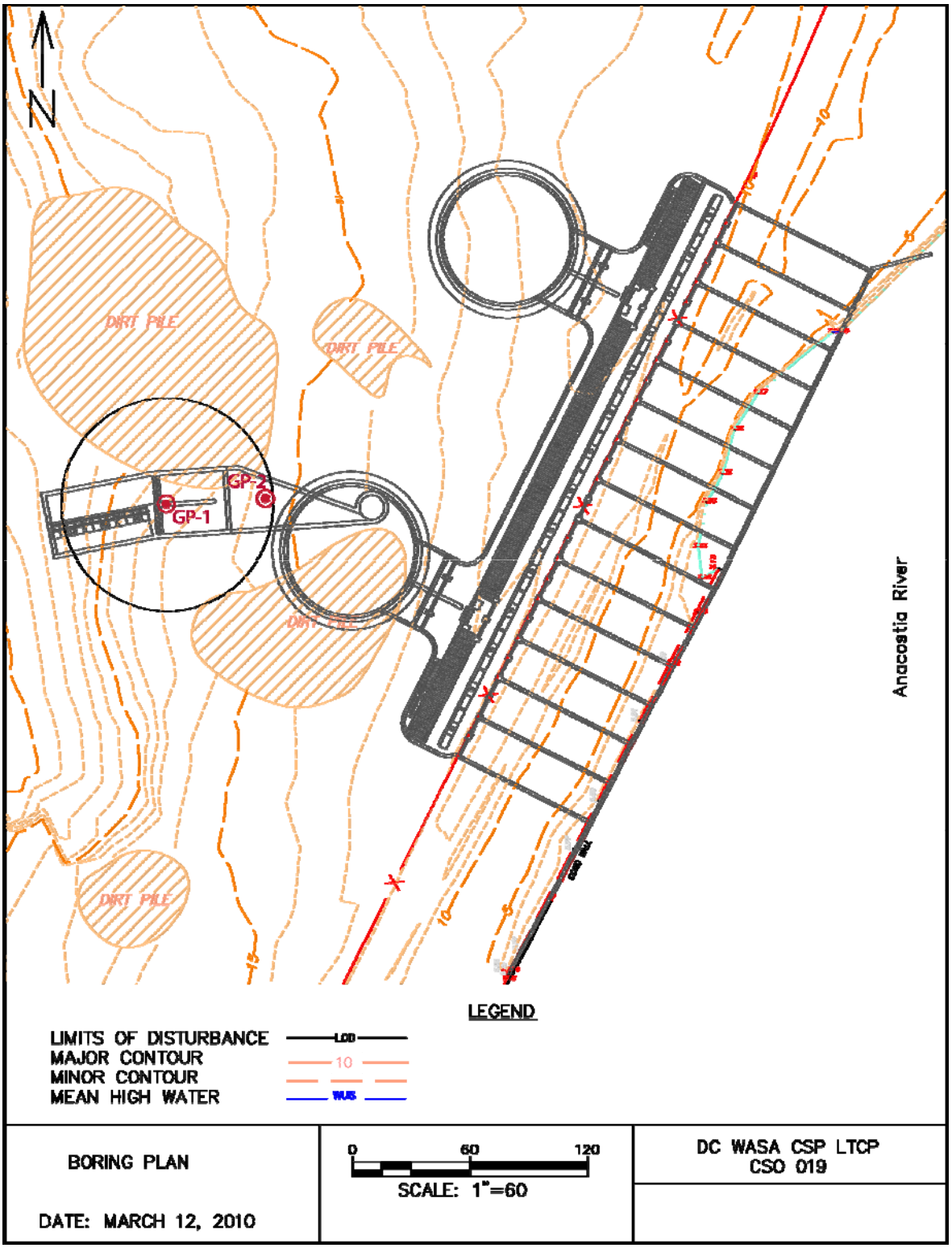
## Results and Conclusions

Stratigraphies revealed in the two borings were generally similar, with each consisting of a thick surface covering of earthen fill atop alluvial deposits of the Anacostia River. At the most landward boring (GP-1) introduced fill extends to the depth of 19 ft, which corresponds to an elevation near sea level. Closer to the river at the location of Boring GP-2 earthen fill is even deeper, and at 21.3 ft deep, ranges to an elevation of nearly 6 ft below sea level. At each location silty to sandy estuarine or riverine sediments underlie the fill, and at the GP-1 location brick chips contained within the upper 2.5 ft indicate deposits of modern origin.

Neither of the borings encountered any layers of terrestrial origin, and both identify artificially made land similar to that previously documented closer to the Anacostia River. Accordingly, no potential for cultural resources exists at either location. Since the fill in Boring GP-1 terminates just about at sea level, this location may originally have been some type of tidal flat or beach that formed a narrow strand intervening between the river and higher uplands not very far to the west. In fact, given the western rise in site topography, the original shoreline was probably no more than 25 ft west of the GP-1 location. In contrast, by the location of Boring GP-2 only 50 ft to the east, deeper fill ranging to well below sea level clearly marks a position that was originally open water of the river.

## Descriptions for Core Borings

| Depth (ft) | Pedologic Horizon | Characteristics |
|---|---|---|
| **Boring GP-1 (Ele. ~18 ft)** | | |
| 0 - 16.5 | C | Earthen fill with gravel and brick |
| 16.5 - 19.0 | 2Cg | Very dark gray (2.5Y 3/1) sandy loam with brick chips; modern river sediments |
| 19.0 - 20.0 | 2C | Olive brown (2.5Y 4/3) sandy loam; river sediments |
| **Boring GP-2 (Ele. ~15.5 ft)** | | |
| 0 - 21.3 | C | Earthen fill with gravel, rubble, brick and cinders |
| 21.3 - 23.0 | 2Cg1 | Very dark grayish brown (2.5Y 3/2) silt loam; estuarine sediments |
| 23.0 - 24.6 | 2Cg2 | Very dark gray (2.5Y 3/1) silt loam; estuarine sediments |
| 24.6 - 25.0 | 3C | Brown (10YR 4/3) loamy sand with wood fibers; river sediments |




**Map of Boring Locations**

# MEMORANDUM OF AGREEMENT

AMONG THE DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY, NATIONAL PARK SERVICE CAPITAL REGION, BOLLING AIR FORCE BASE, AND THE DISTRICT OF COLUMBIA HISTORIC PRESERVATION OFFICE

PURSUANT TO 36 CFR 800

REGARDING

THE ANACOSTIA RIVER PROJECTS

WHEREAS, the District of Columbia Water and Sewer Authority (DC WASA) proposes to construct a deep tunnel system to provide storage capacity and conveyance for combined sewer overflows (CSOs) in Washington, DC in accordance with the documents entitled "DC WASA Long Term Control Plan (July 2002)" and the "Facilities Plan (September 2008)" (the Undertaking); and

WHEREAS, DC WASA has established the Undertaking's area of potential effects (APE), as defined at 36 CFR 15 800.16(d), to be the physical limits of disturbance at eight proposed surface disturbance areas outlined in the Environmental Assessment prepared for the Anacostia River Projects (May 2010); and

WHEREAS, DC WASA has determined that the Undertaking will have adverse effects on the Anacostia Seawall (a contributing element to Anacostia Park), which meets the eligibility criteria for inclusion in the National Register of Historic Places (NRHP); and

WHEREAS, DC WASA has determined that the Undertaking includes construction within the APEs at two surface disturbance areas with high potential to contain unidentified archeological resources, and that the presence of deep fill precludes an archaeological identification survey at this time; and

WHEREAS, DC WASA has determined that the Undertaking may potentially have adverse effects on unidentified archaeological resources at these two surface disturbance areas (Poplar Point and Bolling Air Force Base); and

WHEREAS, DC WASA will undertake combined Phase I and II archaeological investigations prior to commencing any construction activities that would extend below the fill, unless DC WASA finds such investigations infeasible and therefore will provide satisfactory documentation why such investigation is infeasible for approval by the National Park Service (NPS), Bolling Air Force Base (BAFB) and the District of Columbia Historic Preservation Office (DC HPO); and

WHEREAS, DC WASA will undertake mitigation for any National Register-eligible archaeological resources identified during the combined Phase I and II archaeological investigations and will obtain approval from the DC HPO, BAFB, and NPS on mitigation plans; and

WHEREAS, DC WASA has consulted with the DC HPO, BAFB, and NPS in accordance with Section 106 of the National Historic Preservation Act, 16 U.S.C. § 470 (NHPA), and its implementing regulations (36 CFR Part 800.6(b)(1)) to resolve the adverse effects of the Undertaking on historic properties (including the Anacostia Seawall and potentially National Register-eligible resources that may be identified during archaeological survey at Poplar Point and Bolling Air Force Base); and

WHEREAS, the Advisory Council on Historic Preservation (Council) will be informed of the adverse effect and will be invited to participate in the consultation; and

WHEREAS, members of the public were afforded an opportunity to participate in and comment upon the undertaking at public meetings on September 17, 2009, and May 27, 2010; end

WHEREAS, pursuant to 36 CFR 800.6(c)(2) DC WASA has invited the DC HPO, NPS, and Bolling Air Force Base to sign this Memorandum of Agreement (MOA);

NOW, THEREFORE, DC WASA, NPS, BAFB, and the DC HPO agree that upon DC WASA's decision to proceed with the Undertaking, DC WASA shall ensure that the following stipulations are implemented in order to take into account the effects of the Undertaking on historic properties (including the Anacostia Seawall and potentially National Register-eligible resources that may be identified during archaeological survey at Poplar Point and BAFB), and that these stipulations shall govern the Undertaking and all of its parts until this MOA expires or is terminated.

## Stipulations

DC WASA shall ensure that the following stipulations are implemented:

I. Combined Phase I and II Archaeological Investigations - DC WASA will coordinate its plans and research design for a combined Phase I and II survey at the BAFB and Poplar Point surface disturbance areas with the DC HPO at least 30 days prior to undertaking field investigations. DC WASA will complete archaeological investigations in advance of any physical disturbance that has potential to affect archaeological resources, or concurrently with the construction excavation if determined by DC HPO that such investigation prior to construction would be impracticable. DC HPO will prepare a *Conditional No Adverse Effect* form to accompany the DC WASA building permit application to allow approval of the construction permit.

II. Archaeological Mitigation – DC WASA will coordinate mitigation plans for any National Register-eligible archeological resources identified during the combined Phase I and II archaeological investigations with DC HPO and Bolling Air Force Base.

III. Design - DC WASA shall submit final design plans to allow DC HPO, NPS, the National Capital Planning Commission (NCPC), and the Commission of Fine Arts (CFA) to ensure that facility designs are consistent with cultural resource commitments outlined during Section 106 consultation for the Anacostia Seawall and Anacostia Park. Because all surface disturbance areas are proximate to historic properties (such as Surface Disturbance Area I, which is adjacent to the National Register-eligible Main Sewage Pumping Station), final design plans for all surface disturbance areas will be submitted to allow agencies to determine whether any design revisions at surface disturbance areas require additional

agency coordination. Design review shall be limited to project elements within the APEs of each surface disturbance area with potential physical and visual effects on cultural resources. Agency review is subject to a fifteen (15) day time limitation beginning upon the date of receipt of said plans. DC WASA shall assume concurrence if there is no response from the DC HPO, NPS, BAFB, NCPC, or CFA during that time frame.

IV. Records and Collections - DC WASA shall ensure that all records resulting from survey and excavation at the Poplar Point site are curated according to the curation standards documented in the *Guidelines for Archaeological Investigations in the District of Columbia* (April 1998), and that all artifacts and other material resulting from the same survey and excavation are maintained in accordance with these guidelines. DC WASA shall ensure that all records from survey and excavation at the BAFB site are curated according to federal curation standards outlined in 36 CFR Part 79 – *Curation of Federally Owned and Administered Archaeological Collections*, and that all artifacts and other material resulting from the same survey and excavation are maintained in accordance with this regulation.

V. Professional Qualifications Standard – All cultural resource investigations and work performed pursuant to MOA Stipulations I and II shall be conducted by or under the direct supervision of a person who meets the Secretary of Interior's Professional Qualifications Standards as Architectural Historian, Historic Architect, Historian and Archeologist (see, FR 44738-9 or 37 CFR Part 60).

VI. Dispute Resolution – Should any of the parties to this MOA object within thirty (30) days to any action carried out pursuant to this MOA, DC WASA shall consult with the objecting party to resolve the objection. If DC WASA determines that the objection cannot be resolved, DC WASA shall forward documentation relevant to the dispute and request the further comments of the Council pursuant to 36 CFR §800.6(b). The Council shall respond within 30 days after receipt of the relevant material. Any Council comment provided in response to such a request will be taken into account by DC WASA in accordance with 36 CFR §800.7(c) with reference only to the subject of the dispute. DC WASA's responsibility to carry out all actions under the MOA that are not the subjects of the dispute will remain unchanged.

VII. Amendments – If any of the signatories to this Agreement believes that the terms of the MOA cannot be carried out, or that an amendment to the terms must be made, the signatory shall immediately consult with the other signatories to develop amendments in accordance with 36 CFR §800.6(c)(7). If an amendment cannot be agreed upon, the dispute resolution process set forth in Stipulation VI will be followed.

VIII. Termination – Any signatory to this Agreement may terminate the Agreement by providing 30 days' written notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. Termination of this Agreement would require compliance with 36 CFR Part 800. This Agreement may be terminated by the execution of a subsequent agreement that explicitly terminates or supersedes its terms.

IX. Duration – This Agreement shall be null and void if its terms are not carried out within five (5) years from the date of its execution, unless the signatories agree in writing to an extension for carrying out its terms.

Execution of this MOA by DC WASA, DC HPO,NPS, NCPC, CFA, and BAFB and its submission to the Council in accordance with 36 CFR 800.6(b)(1)(iv), shall, pursuant to 36 CFR 800.6(c), be considered to be an agreement with the Council for the purposes of Section 110(l) of NHPA. Execution and submission of this MOA, and implementation of its terms evidence that

DC WASA has afforded the Council an opportunity to comment on the Undertaking and its effects on historic properties, and that DC WASA has taken into account the effects of the Undertaking on historic properties.

IN WITNESS WHEREOF, the parties have caused this AGREEMENT to be executed, each by its duly authorized officers, as of the date first written above.

District of Columbia Water and Sewer Authority

By:_____ Date:_____

The District of Columbia Historic Preservation Office

By:_____ Date:_____

National Park Service Capital Region

By:_____ Date:_____

The United States Air Force at Bolling Air Force Base

By:_____ Date:_____

CONCUR:

National Capital Planning Commission

By:_____ Date:_____

Commission of Fine Arts

By:_____ Date:_____