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District of Columbia Department of Health, Environmental Health Administration,
Bureau of Environmental Quality, Water Quality Division

Lithologic Coring in the Lower Anacostia Tidal Watershed, Washington, D.C., July 2002

Open-File Report 03-318

U.S. Department of the Interior
U.S. Geological Survey

Cover. The main channel of the Anacostia River downstream of the Benning Road Bridge. (Note the hose along the right shoreline used to transport hydraulically dredged sediment to the Kingman Lake disposal area.)

[Photo from the National Oceanic and Atmospheric Administration (NOAA), 2000]

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Baltimore, Maryland
2003

U.S. Department of the Interior
GALE A. NORTON, Secretary

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Conversion Factors and Vertical Datum

Multiply	By	To obtain
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer

Vertical datum: In this report, “sea level” refers to the National Geodetic Vertical Datum of 1929—a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

Lithologic Coring in the Lower Anacostia Tidal Watershed, Washington, D.C., July 2002

By Frederick J. Tenbus

Abstract

Little is known about the volumetric flux of ground water to the lower tidal Anacostia River, or whether ground-water flow is an important component of the contaminant load in this part of the Anacostia River. The watershed is in the eastern part of Washington, D.C., and has been subjected to over 200 years of urbanization and modifications of the river channel and nearby land areas. These anthropogenic factors, along with tidal fluctuations in the river, make ground-water data collection and interpretations difficult.

The U.S. Geological Survey is cooperating with the District of Columbia Department of Health, Environmental Health Administration, Bureau of Environmental Quality, Water Quality Division, in a study to assess nonpoint-source pollution from ground water into the lower tidal Anacostia River. Lithologic cores from drilling activities conducted during July 2002 in the study area have been interpreted in the context of geologic and hydrogeologic information from previous studies in the lower Anacostia tidal watershed. These interpretations can help achieve the overall project goals of characterizing ground-water flow and contaminant load in the study area.

Hydrostratigraphic units encountered during drilling generally consisted of late Pleistocene to Holocene fluvial deposits overlying Cretaceous fluvial/deltaic deposits. Cores collected in Beaverdam Creek and the Anacostia River indicated high- and low-energy environments of deposition, respectively. Two cores collected near the river showed different types of anthropogenic fill underlain by low-energy deposits, which were in turn underlain by sand and gravel. A third core collected near the river consisted primarily of sand and gravel with no artificial fill.

Introduction

The U.S. Geological Survey (USGS) is cooperating with the District of Columbia Department of Health, Environmental Health Administration, Bureau of Environmental Quality, Water Quality Division (DC DOH), in a study to assess nonpoint-source pollution from ground water into the lower tidal Anacostia River. The study area is within Washington, D.C. in the lower Anacostia tidal watershed adjacent to and in the channel of the Anacostia River (figs. 1a and 1b). Little is known about the volumetric flux of ground water to the lower tidal Anacostia River, or whether the ground water represents a contaminant source to the river. Assessing the ground-water flux and possible contaminant sources is difficult for several reasons. First, the river within the study area is subject to tidal fluctuations of 2 to 3 feet, which makes measuring discharge to the river problematic. Second, because of the urban nature of the study site, access to potential drill sites is difficult, which means that data-collection possibilities are limited. Finally, the study area has been altered by over 200 years of anthropogenic modifications such as dredging, filling, and urbanization, resulting in hydrogeologic characteristics that are spatially variable in ways that are difficult to predict. Information obtained from USGS fieldwork during summer 2002 (Miller and Klohe, 2003), along with interpretations of available subsurface data from this study and from other sources, can provide insight for ground-water investigations in the lower tidal Anacostia River.

Objective and Scope of Work

The objective of this report is to present the results of the lithologic coring and well installation in the lower Anacostia tidal watershed in July 2002 within the context of the geologic and hydrogeologic framework of the area. A USGS drilling team collected geologic cores during the drilling of five monitor wells at three locations (near the New York Avenue bridge, in Kenilworth Aquatic Gardens, and in Anacostia Park). In addition, the USGS collected cores at two sites within the Anacostia river channel (north of Benning Road) and Beaverdam Creek (about 150 feet above its confluence with the Anacostia River) using the USGS hoverprobe, which consists of a vibracore drill rig mounted on a hovercraft (Phelan, Senus, and Olsen, 2001).

Geologic Setting

Washington, D.C. is situated on both sides of the Fall Line, which is the boundary between two physiographic provinces—the Piedmont, which is west of the Fall Line, and the Coastal Plain, east of the Fall Line (figs. 1a and b). In the study area, the Piedmont consists of deeply weathered metamorphic and igneous rocks dipping to the southeast at about 125 feet per mile (Darton, 1950), overlapped by an eastward thickening wedge of unconsolidated Coastal Plain sediment (Johnston, 1964). The lower Anacostia tidal watershed is in the eastern part of Washington, D.C. and in Prince Georges County, Maryland, entirely within the Coastal Plain (figs. 1a and 1b).

The Coastal Plain consists of layers of sedimentary deposits in this area, ranging in age from Cretaceous to Recent (Cooke, 1952). Surficial deposits near the Anacostia River in Washington, D.C. (fig. 2) consist primarily of the Arundel Clay and Patapsco Formation of the upper Potomac Group (primarily Cretaceous nonmarine clay with sandy clay and sand), Pleistocene terrace gravels, Pleistocene and Holocene alluvium, and artificial fill derived from local deposits or dredge spoils (Johnston, 1964; Froelich and Hack, 1976). A conceptualization of the stratigraphic relations of these units in the lower tidal Anacostia River valley is shown in figure 3.

Descriptions of the unconsolidated geologic units in Washington, D.C. are available in Darton (1950), Cooke (1952), Johnston (1964), Froelich and Hack (1976), Fleming, Drake, and McCartan (1994), Davis and others (2001), and other published and unpublished sources (such as CH2M HILL, 2002). The Arundel Clay generally consists of dark gray massive clay that is overlain by the Patapsco Formation's massive maroon clay and sand and clay of various colors (Johnston, 1964). In the area adjacent to the Anacostia River, these units are unconformably overlain by Pleistocene channel-flood plain fluvial deposits consisting of gravel, sand, and silt, along with Holocene alluvium and artificial fill (Johnston, 1964).

A complicating factor in the geologic setting of the study area is that for the past 200 or more years, the river has been subjected to major sedimentation as the watershed changed from forest to agriculture to urban and suburban land uses (Williams, 1977). In addition, various dredging and filling activities have altered the natural morphology of the channel and the adjacent areas. The sediment deposited during urbanization probably was deposited in a fining-upward sequence, which resulted in much of the modern river channel being filled with soft organic silt and clay (Hill and McLaren, 2000), underlain by coarser-grained sediment. Much of the fill material in areas adjacent to the Anacostia River probably came from dredge spoil, most of which is fine-grained. The source of the fill material in many areas is not known with certainty, however, so particle size can be variable, consisting of clay-sized particles to boulders, along with manmade materials such as brick, concrete, and glass.

Acknowledgments

The author would like to thank several people who contributed to this report. Michael Herder, a contractor for the USGS, was the driller and hoverprobe operator. Daniel Phelan of USGS coordinated and led the drilling and hoverprobe efforts, served as the driller's helper, and described the lithologic cores with the author. David Powars (USGS), Earl Greene (USGS), and Diane Douglas of the DC DOH provided technical reviews of the report. In addition, David Powars reviewed the lithologic core descriptions by comparing the descriptions to the original cores. Timothy Auer (USGS) did the illustrations in the report, and Valerie Gaine (USGS) did an editorial review.

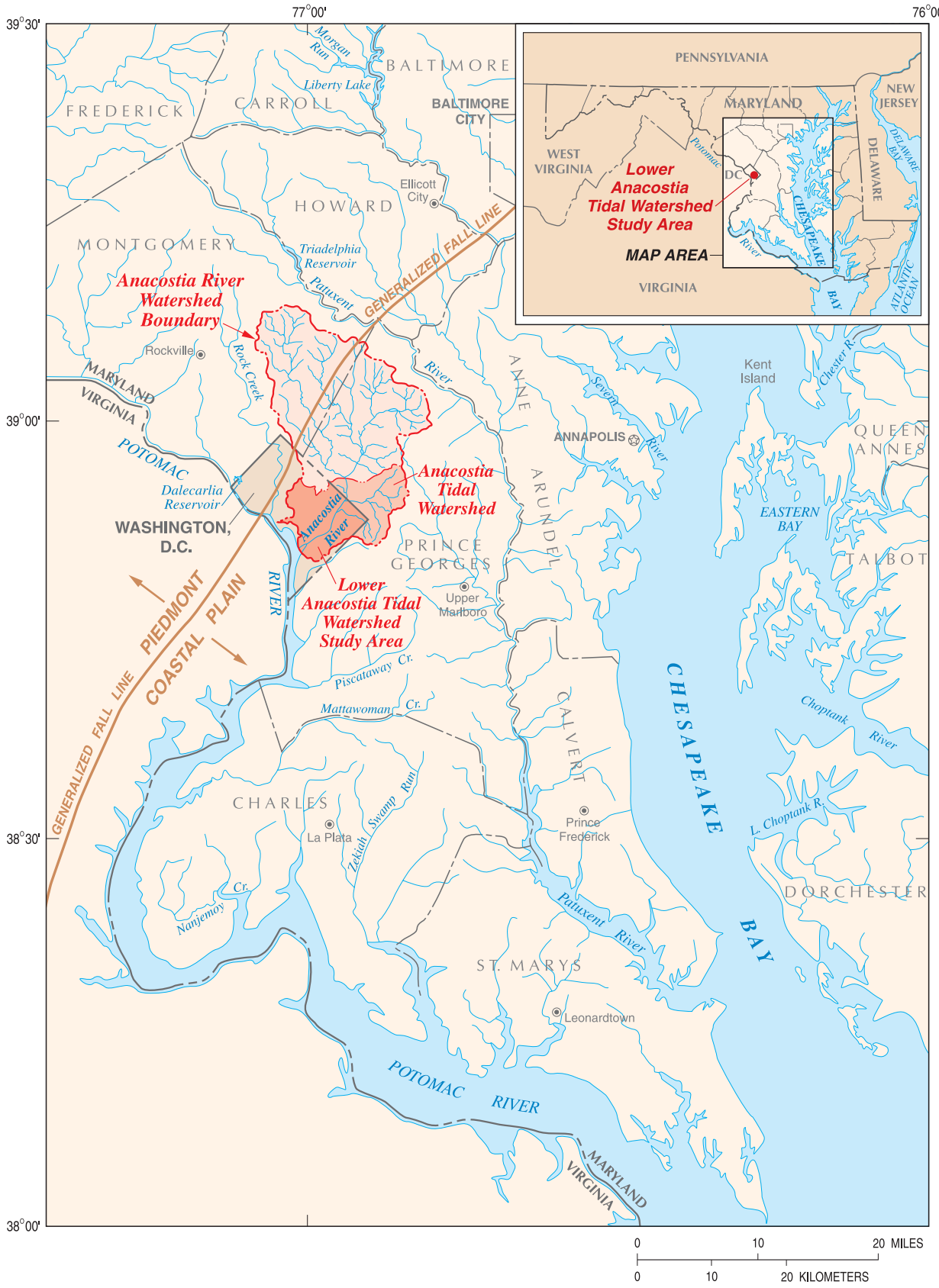
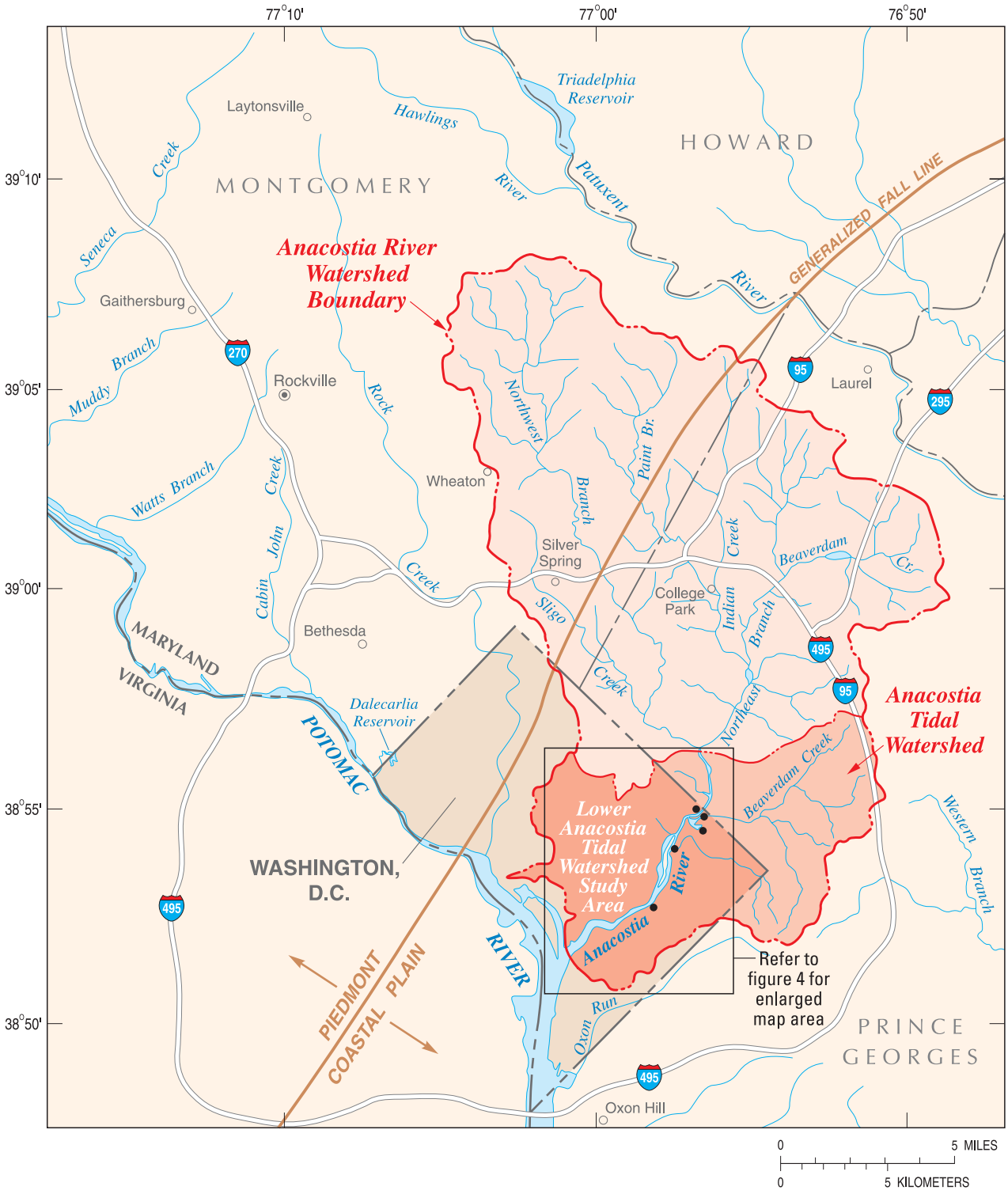


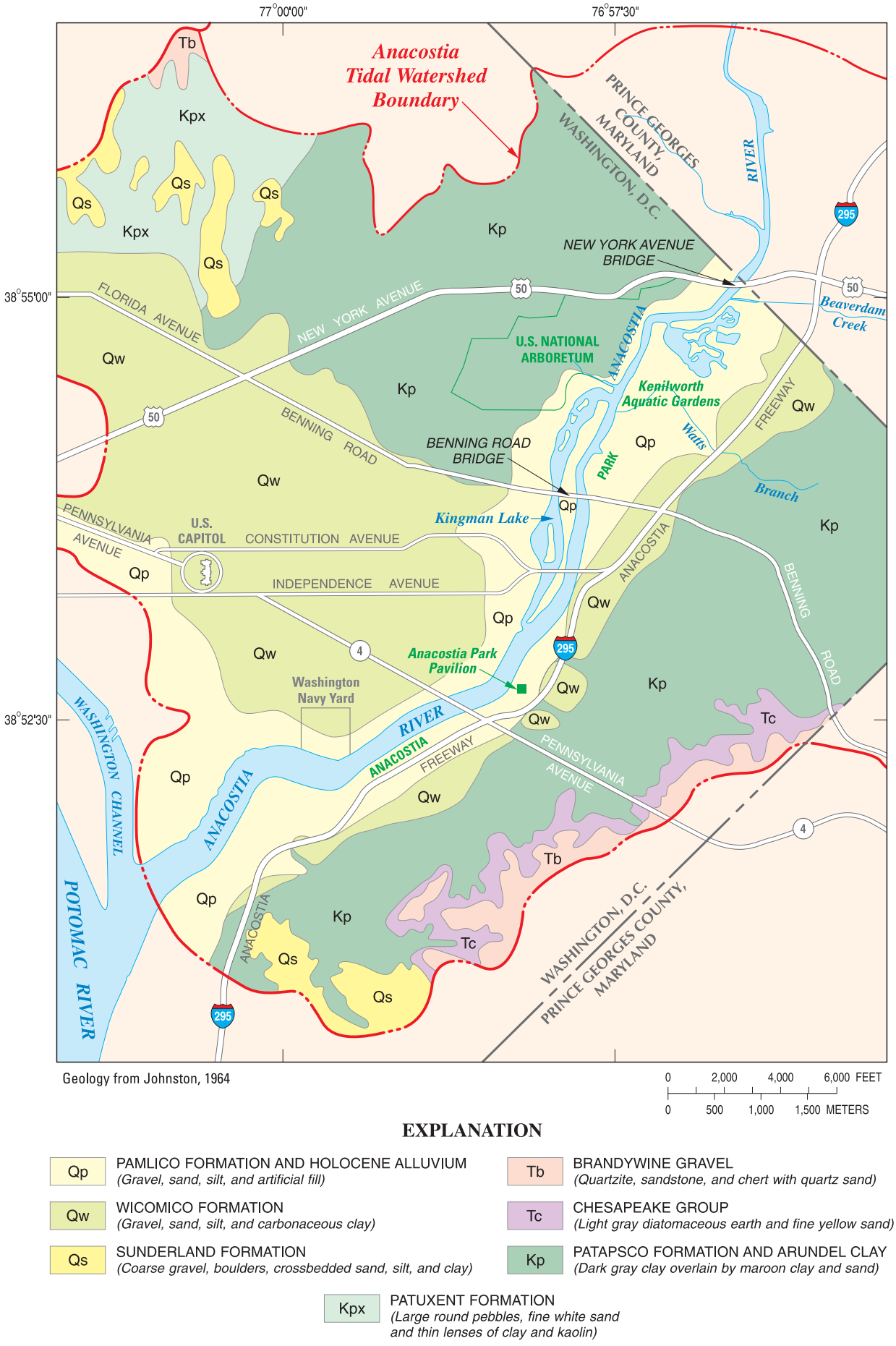
Figure 1a. Location of the Anacostia River watershed and the lower Anacostia tidal watershed study area in Washington, D.C.



EXPLANATION

● LOCATION OF MONITOR WELLS AND HOVERPROBE BORING SITES
(Refer to figure 4 for site locations and identification numbers.)

Figure 1b. Detailed view of the Anacostia River watershed, the lower Anacostia tidal watershed study area in Washington, D.C., and location of monitor wells and hoverprobe boring sites.



EXPLANATION

Qp	PAMLICO FORMATION AND HOLOCENE ALLUVIUM *(Gravel, sand, silt, and artificial fill)*	Tb	BRANDYWINE GRAVEL *(Quartzite, sandstone, and chert with quartz sand)*
Qw	WICOMICO FORMATION *(Gravel, sand, silt, and carbonaceous clay)*	Tc	CHESAPEAKE GROUP *(Light gray diatomaceous earth and fine yellow sand)*
Qs	SUNDERLAND FORMATION *(Coarse gravel, boulders, crossbedded sand, silt, and clay)*	Kp	PATAPSCO FORMATION AND ARUNDEL CLAY *(Dark gray clay overlain by maroon clay and sand)*
Kpx	PATUXENT FORMATION *(Large round pebbles, fine white sand and thin lenses of clay and kaolin)*		

Figure 2. Geologic map of Coastal Plain deposits in the lower Anacostia tidal watershed study area, Washington, D.C.

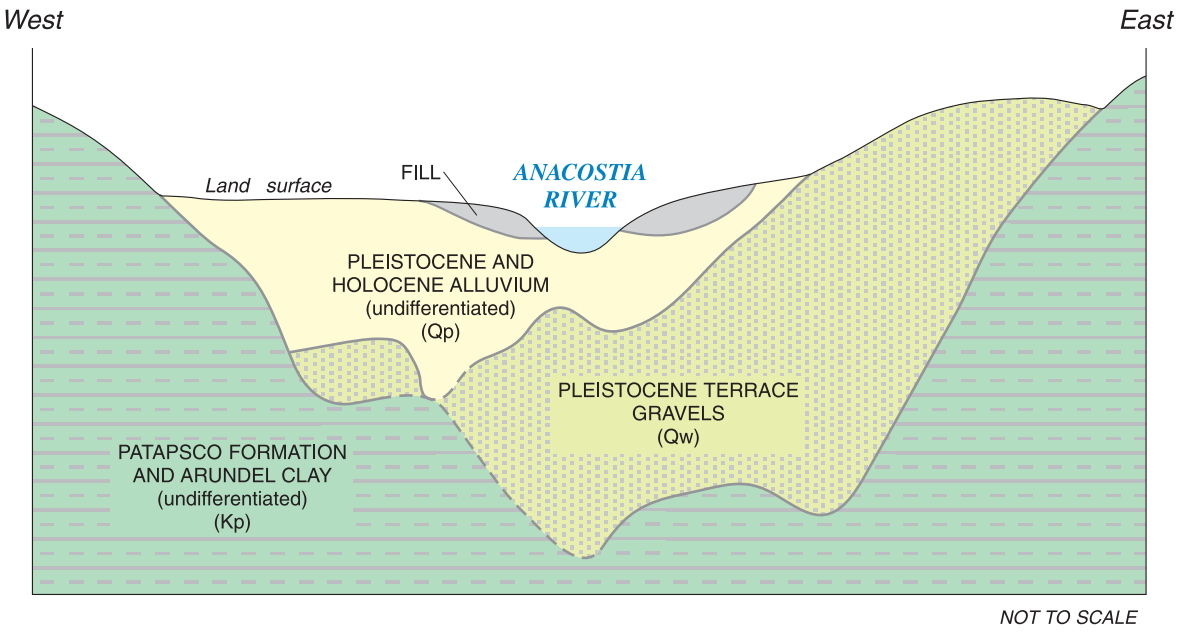


Figure 3. Conceptualization of stratigraphic relations in the Anacostia River valley, Washington, D.C.

Lithologic Coring

As part of the current study, lithologic cores were collected from three locations near the Anacostia River and two within the Anacostia River and the mouth of Beaverdam Creek (fig. 4). Cores at the three locations near the river were collected with a truck-mounted drill rig that had vibracore and augering capabilities. Cores at the two within-channel sites were collected using the USGS hoverprobe (fig. 5), which consists of a vibracore drill rig mounted on a hovercraft (Phelan, Senus, and Olsen, 2001).

At each site, lithologic samples were collected in 5-foot-long core barrels. Core barrels were advanced one at a time, the depth to the top of the core in the drill string was measured with a weighted tape, and the amount of recovery in each core was calculated before advancing the next core barrel. Core barrels were advanced without retrieval until it was determined that the percentage of core recovery was too small. When this happened, all of the core barrels were pulled out of the hole, and the core in each of the barrels was vibrated out into plastic trays for logging and archiving. The coring process was then repeated until refusal, which generally occurred about 30 to 40 feet below land surface.

Monitor wells were installed at the three onshore sites, and the target depth was sometimes deeper than could be accomplished with the vibracore. In these holes, a solid-stem auger was used to attain the desired depth after refusal with the vibracore. In some cases, it was possible to obtain samples of clay and silt because the material stuck to the auger flights; however, the depth of the sample could only be estimated. Coarser-grained material (sand and gravel) did not stick to the augers and was therefore not sampled. Although samples of silt and clay from the auger flights were of poorer quality than those from the vibracore, auger sampling provided information about the subsurface that was useful to this investigation. The lack of discrete sampling by use of this method, however, limits the possible interpretive results.

Lithologic cores were placed in wax-coated cardboard core boxes (fig. 6) and labeled with well or hoverprobe site number and depth below land or riverbed surface. Brief descriptions of the core material were made onsite. At a later date, more detailed descriptions using the Unified Soil Classification System (Casagrande, 1948) for grain size and Munsell Soil Color Charts (Munsell Color, 1990) for color descriptions were made of the boxed cores at the USGS office in Baltimore, Maryland. A lithologic section showing the relative location of the sediment encountered in each borehole is shown in figure 7 (note that lithologic units between boreholes were not correlated on the cross section because the units are not believed to be continuous at the scale shown). The lithologic descriptions are listed in Appendix 1.

Lithology of the Hoverprobe Sites

Lithologic cores were obtained from two sites in the lower Anacostia tidal watershed using the USGS hoverprobe. One site (DCHP01) was on a tidal flat within the Anacostia channel about 1,700 feet north of Benning Road

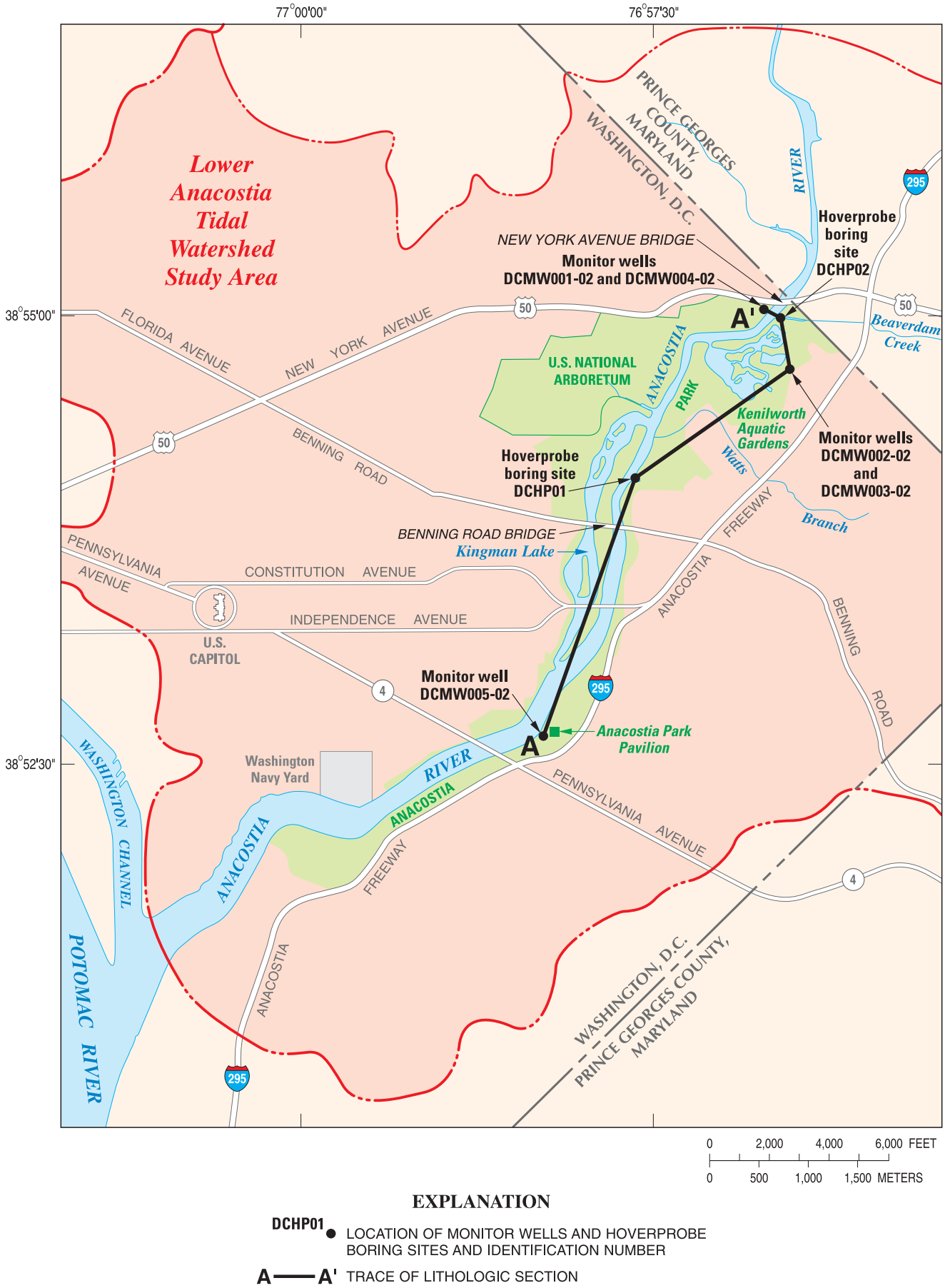


Figure 4. Location of monitor wells, hoverprobe boring sites, and trace of lithologic section A-A' along the Anacostia River, Washington, D.C., July 2002.

Figure 5. U.S. Geological Survey hoverprobe and support craft on a tidal flat in the Anacostia River north of Benning Road, Washington, D.C., July 2, 2002. *(Photo by Mastin Mount, USGS)*

on the east side of the river (fig. 4). The other site (DCHP02) was upstream near the Washington, D.C. boundary, within Beaverdam Creek, about 150 feet from its confluence with the Anacostia River (fig. 4). The lithology at each of these sites (Appendix 1) reflects the different depositional environments of these parts of the river system.

The surficial sediment on the tidal flat north of Benning Road was deposited in a low-energy environment, as indicated by the fine-grained texture. All but 2 of the top 20 feet of sediment in the DCHP01 corehole consisted of silt or clay, much of it dark gray (fig. 6). The only sandy material in the top 20-foot interval was a dark gray fine sand from 5.5 to 7.5 feet below land surface. The color, texture, and stratigraphic position of this unit indicate that it is Holocene alluvium. Between about 20 and 30 feet below land surface, mixtures of gravel, sand, silt, sandy clay, and fine sand dominate. The sediment encountered in this 10-foot unit is similar to a sand and gravel unit described in many boreholes at the Washington Navy Yard (CH2M HILL, 2002). The bottom of the DCHP01 corehole, which was at 30.5 feet below land surface, was in a very stiff clay with red and olive marbling. The clay is consistent with the description of clay in the Patapsco Formation and Arundel Clay, which crops out on each side of the Anacostia River valley in this area (Johnston, 1964).

In contrast to core collected in the tidal flat at hoverprobe site DCHP01, the core collected from the mouth of Beaverdam Creek (DCHP02) mainly consisted of gravel and sand. This is consistent with findings by Hill and McLaren (2000), who report that although most of the bottom sediment in the Anacostia River at the Washington, D.C.–Maryland border is sandy mud, at the point where Beaverdam Creek enters the Anacostia, the bottom sediment is sand and gravel. In Beaverdam Creek, core was collected with the hoverprobe to a depth of 27.9 feet below the streambed, and the only fine-grained material consisted of two silty clays—one from 3.5 to 6.8 feet, and another from 8.7 to 9.1 feet below the streambed. The rest of the material consisted of gravel and sand, which indicates that the material was deposited in a moderate- to high-energy environment. In the upper layer of gravel and sand (0 to 2.8 feet below the streambed), several glass fragments were found, which appeared to be from a windshield. This would indicate that the time of deposition or reworking of the associated sediment was within the last 100 years. The deeper sand (from about 13 to 28 feet below land surface) was pale and poorly graded, with subrounded grains. This sand probably was deposited in an estuarine environment or a stream channel (David Powars, U.S. Geological Survey, oral commun., 2002).

Lithology of the Monitor Well Sites

The three monitor well sites where lithologic cores were collected during July 2002 (fig. 4) are on the southwestern side of the New York Avenue bridge, in Kenilworth Aquatic Gardens, and in Anacostia Park near the Anacostia Park Pavilion. The lithology of these sites can be interpreted with regard to dredging and filling activities, as well as

Figure 6. Example of lithologic core collected from hoverprobe boring site DCHP01 on a tidal flat in the Anacostia River north of Benning Road, Washington, D.C., July 2, 2002. *(Photo by Daniel Phelan, USGS)*

natural depositional environments. The lithologic descriptions are listed in Appendix 1.

New York Avenue Bridge Well Site The northernmost monitor well site in the study area is at the New York Avenue bridge on the western shore of the Anacostia River. This site is about 500 feet west-northwest of hoverprobe site DCHP02 (fig. 4), at an elevation of about 13 feet above sea level. Two monitor wells were installed at this site about 8 feet apart, with screen depths of 15 to 25 feet (well DCMW001-02) and 22 to 32 feet below land surface (well DCMW004-02). Lithologic samples were collected with vibracore (to 32.9 feet below land surface) and augering methods (a single sample from about 60 to 62 feet below land surface).

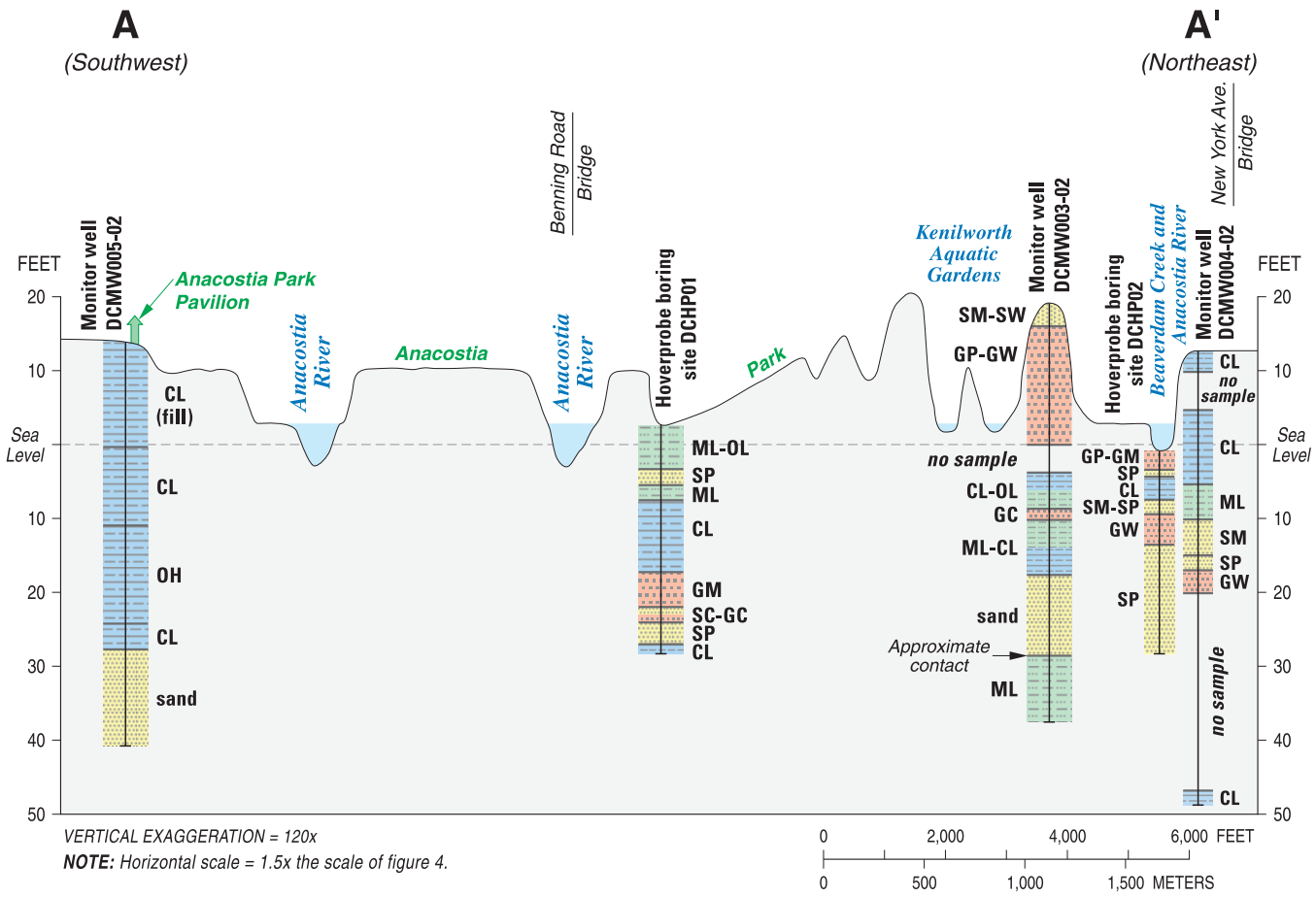
The recent depositional history of this site can be inferred from available maps and literature. In the mid-1700s, a port north of the current Washington, D.C. boundary reportedly had water depths of 40 feet (Port Towns Community Development Corporation, [n.d.]). Williams (1977) states that the Anacostia was navigable north of the Washington, D.C. boundary by cargo ships until at least 1800, and that heavy sedimentation coincided with increased agriculture and development in the 19th and 20th centuries. An early topographic map (U.S. Geological Survey, 1904) shows a wetland on the western shore of the Anacostia River on the northeastern boundary of Washington D.C. at the end of the 19th century. Darton (1950, plate 1) shows that the wetland still existed in the early to middle part of the 20th century. By 1965, a topographic map (U.S. Geological Survey, 1979) indicates that the New York Avenue bridge had been built, and the land surface had been altered by artificial fill in the area of the drill site.

Field observations are consistent with the artificial fill and wetland sediment shown on the maps. The shallowest material (from 0 to about 8 feet) is artificial fill. Below this interval (from about 8 to18 feet below land surface), sediment consists mainly of dark gray clay and silty clay (Appendix 1), which might be dredge spoil from the Anacostia or low-energy alluvial or wetland deposits. Dark silt from about 18 to 23 feet below land surface appears to be alluvium deposited in a low-energy environment below present-day sea level. The shallow fine-grained deposits at this site probably represent either recent alluvium deposited from deforestation and urbanization during the 19th and 20th centuries, or possibly fill from nearby navigational dredging during the same time period.

Beneath the silt is a somewhat thicker sequence of fining-upward gravel, sand, and silty sand (Appendix 1). This coarser-grained sediment was deposited in a higher-energy environment than the overlying silt. Because the sediment is below the present-day sea level, it likely represents a fluvial paleochannel deposit from the Pleistocene epoch, when sea level was lower than today. The bottom of the coarse-grained sediment could not be determined at this location because sample recovery was very poor below a depth of 33 feet. One sample was collected at the bottom of the auger flights from about 60 to 62 feet below land surface. This sample consisted of very stiff clay, which is consistent with the Patapsco Formation and Arundel Clay of Cretaceous age (Johnston, 1964).

Kenilworth Aquatic Gardens Well Site This site is about 2,200 feet south-southeast of the New York Avenue bridge well site (fig. 4). The drilling site is east of the Kenilworth Aquatic Gardens ponds, at an altitude of about 19 feet above sea level. Two monitor wells were installed adjacent to one another at this site. One well (DCMW002-02) is screened from 12.6 to 22.6 feet below land surface, and the other (well DCMW003-02) is screened 36.3 to 46.3 feet below land surface. Lithologic samples were collected using the vibracore (to 37.2 feet below land surface) and augering methods (limited sampling to 57 feet below land surface).

The surficial material at this site is coarse-grained and appears to have been deposited naturally. The soil map of



EXPLANATION

DCHP01

MONITOR WELL OR HOVERPROBE BORING SITE AND IDENTIFICATION NUMBER

STRATIGRAPHIC CONTACT

UNIFIED SOIL CLASSIFICATION SYSTEM

SYMBOL AND MAJOR DIVISION	LETTER	DESCRIPTION
GRAVEL	GP	Poorly graded gravel
	GW	Well graded gravel
	GM	Silty gravel
	GC	Clayey gravel
SAND	SP	Poorly graded sand
	SW	Well graded sand
	SM	Silty sand
	SC	Clayey sand
SILT	ML	Inorganic silt, very fine sand, and clayey silt
	OL	Organic silt and organic clayey silt
CLAY	CL	Inorganic clay, silty clay, and sandy clay
	OH	Organic clay

Figure 7. Lithologic section A-A' along the Anacostia River, Washington, D.C.

Washington D.C. shows the drill site on a natural soil described as "excessively well drained" (Smith, 1976). The surficial sediment at this site represents an outcrop of a Pleistocene terrace deposit as mapped by Johnston (1964).

The material encountered during drilling at this site was mostly coarse-grained. The top 23 feet of sediment consisted almost entirely of gravel, sand, and gravelly sand, with a thin layer or lens of organic silty clay at 19 feet below land surface. Silt and clay sediment, most of which was brown, dominated the interval from 23 to 37 feet below land surface. This sediment was underlain by 10 feet of sandy sediment (from 37 to 47 feet below land surface) that is probably a Pleistocene fluvial-estuarine deposit. Below this deposit is at least 10 feet of silt and clayey silt (from 47 to 57 feet below land surface) that may be Cretaceous or Quaternary (David Powars, U.S. Geological Survey, written commun., 2003).

Anacostia Park Well Site The southernmost well site is in Anacostia Park on the east side of the river near the Anacostia Park Pavilion (fig. 4). Much if not all of Anacostia Park consists of land that was reclaimed by filling in wetlands or tidal flats within the former river channel. Based on historical maps (U.S. Geological Survey, 1904; Darton, 1950), the land was reclaimed during the first half of the 20th century. Williams (1977) concurs with this, stating that a dredging and reclamation project from the Washington Navy Yard northward to the Washington, D.C. boundary started in 1912, and continued through the 1940s and 1950s.

The well site is situated on level ground within the reclaimed land next to a recreational sports field, a skating rink (the Anacostia Park Pavilion), and basketball courts at an altitude of about 14 feet above sea level. A single monitor well (DCMW005-02) was installed at this site with a screen depth of 38.5 to 48.5 feet below land surface. Lithologic samples were collected with vibracore (to a depth of 38.5 feet below land surface) and auger methods (limited sampling to the bottom of the hole at 57 feet below land surface).

The lithologic material encountered during the drilling at this site is consistent with the history of land reclamation at Anacostia Park. The first 14.4 feet of sediment encountered was fill material that consisted of dry, stiff clay mixed with various stones, brick fragments, and debris. The fill material is underlain by fine-grained material (primarily inorganic and organic clay and silty clay) to a depth of about 42 feet below land surface. Beneath that is a sand that continues to the bottom of the hole at 57 feet below land surface.

Johnston (1964) mapped the surficial sediment in much of Anacostia Park as an undifferentiated unit consisting of Holocene and Pleistocene alluvium. Because the description of this unit (Johnston, 1964) includes areas of artificial fill, the description is consistent with observations of the material encountered during drilling and coring at the Anacostia Park well site. The inorganic and organic clay and silty clay encountered between 14.4 and 42 feet below land surface may have resulted from natural deposition in quiet tidal waters, from anthropogenic fill placement during navigational dredging, or from high sedimentation rates during deforestation and urbanization within the watershed. On the USGS (1904) topographic map, the area was shown as open water, whereas upstream locations were mapped with considerable wetlands. The lower part of the clay (from about 39 to 42 feet below land surface) is much stiffer than the rest, indicating that it is a possible Cretaceous deposit, although it is also possible that it may be Pleistocene (David Powars, U.S. Geological Survey, oral commun., 2002). If it is Cretaceous, then the coarser-grained material below the depth of 42 feet also would be Cretaceous.

Summary and Conclusions

The U.S. Geological Survey is cooperating with the District of Columbia Department of Health, Environmental Health Administration, Bureau of Environmental Quality, Water Quality Division, in a study to assess nonpoint-source pollution from ground water into the lower tidal Anacostia River. Lithologic cores from drilling activities conducted in July 2002 in the study area have been interpreted in the context of geologic and hydrogeologic information from previous studies in the lower Anacostia tidal watershed. This report presents the results of the coring and well installation in the lower Anacostia tidal watershed during July 2002 within the context of the general geologic framework of the area.

Lithologic cores were collected with vibracore methods during the drilling of five monitor wells at three locations (near the New York Avenue bridge, in Kenilworth Aquatic Gardens, and in Anacostia Park). In addition, cores were collected at two sites within the Anacostia river channel (north of Benning Road) and Beaverdam Creek (about 150 feet above its confluence with the Anacostia River) using the U.S. Geological Survey hoverprobe, which consists of a vibracore drill rig mounted on a hovercraft.

The lithology of each of the core sites reflected the depositional environment for the sediment, which was determined from geologic literature, historical maps and documents, and examination of the core. For example, most of the sediment recovered from the hoverprobe sampling site on the tidal flat north of Benning Road was fine-grained, dark colored, and appeared typical of the alluvium described in previous investigations. This sediment was deposited in a low-energy environment. In contrast, sediment from the Beaverdam Creek site primarily was coarse-grained and indicative of a high-energy depositional environment. At the New York Avenue bridge well site, the surficial sediment appeared to consist of fill material underlain by dark, silty wetland deposits. These deposits were in turn underlain by sand and gravel, which was in turn underlain by a very stiff clay that appeared to be from the Potomac Group. At Kenilworth Aquatic Gardens, much of the sediment was sand and gravel, which may have been deposited during the Pleistocene epoch. Some clay units were interbedded with the

sand and gravel, and the bottom of the hole appeared to be in a clay unit. Sediment from the well at Anacostia Park consisted of almost 40 feet of clay and silt, much of which likely was deposited in dredging operations and natural channel fill (alluvium). This sediment was underlain by coarser-grained material (probably sand) to a depth greater than 57 feet below land surface.

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Appendix 1. Lithologic logs from hoverprobe and well sites near the Anacostia River, Washington D.C., July 2002.

EXPLANATION

Gravel. Includes Unified Soil Classification System letter symbols GP (poorly graded gravel), GW (well graded gravel), GM (silty gravel), and GC (clayey gravel).

Sand. Includes Unified Soil Classification System letter symbols SP (poorly graded sand), SW (well graded sand), SM (silty sand), and SC (clayey sand).

Silt. Includes Unified Soil Classification System letter symbols ML (inorganic silt, very fine sand, and clayey silt) and OL (organic silt and organic clayey silt).

Clay. Includes Unified Soil Classification System letter symbols CL (inorganic clay, silty clay, and sandy clay), OH (organic clay).

Fill. Includes material from clay size to boulders, as well as man-made material such as brick, concrete, and glass.

The following table can be used to cross reference District of Columbia Department of Health (DC DOH) site names with U.S. Geological Survey (USGS) station names and site identifiers:

DC DOH Site name	USGS Station name	USGS Site identifier	Location and relative depth
DCHP01	WE Ca 30	385406076573401	Anacostia River near Benning Road
DCHP02	WE Cb 7	385500076563401	Beaverdam Creek near mouth
DCMW001-02	WE Bb 3	385504076563801	New York Avenue Bridge (shallow)
DCMW002-02	WE Cb 5	385443076562801	Kenilworth Aquatic Gardens (shallow)
DCMW003-02	WE Cb 6	385443076562802	Kenilworth Aquatic Gardens (deep)
DCMW004-02	WE Bb 4	385504076563802	New York Avenue Bridge (deep)
DCMW005-02	WE Ca 29	385238076581501	Anacostia Park near Pavilion

Project Anacostia Ground Water
Site name DCHP01
Latitude / Longitude 38° 54' 05.8" / 076° 57' 34.2"
Land-surface elevation 2.75 feet (ft) above sea level
Total depth 30.5 ft below land surface

Date drilled 7/2/2002
Date described 7/15/2002
Described by Phelan / Tenbus
Interval 0.0 to 5.0 ft
Drilling method Vibracore

Remarks: Site was on a mud flat on the eastern bank of the Anacostia River in Washington, D.C., north of the Benning bridge. Land-surface elevation was estimated from tide table and visual observations at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from 0 to 11.8 ft is archived in core box 1.

Depth (ft)	Graphic log	Lithologic description
0	ML	Interval—0.0 to 3.1 ft below land surface. Clayey silt (ML), dark greenish gray (5Y 4/1), with thin, nearly black streaks of organic silt (OL) from 0.3 to 1.5 ft.
3.0	OL	Interval—3.1 to 4.0 ft below land surface. Organic silt (OL), very dark gray (2.5Y 3/0), soft, seems to have a faint organic or petroleum odor.
4.0	ML	Interval—4.0 to 5.3 ft below land surface. Clayey silt (ML), dark gray (5Y 4/0).
5.0		

Project Anacostia Ground Water
Site name DCHP01
Latitude / Longitude 38° 54' 05.8" / 076° 57' 34.2"
Land-surface elevation 2.75 ft above sea level
Total depth 30.5 ft below land surface

Date drilled 7/2/2002
Date described 7/15/2002
Described by Phelan / Tenbus
Interval 5.0 to 10.0 ft
Drilling method Vibracore

Remarks: Site was on a mud flat on the eastern bank of the Anacostia River in Washington, D.C., north of the Benning bridge. Land-surface elevation was estimated from tide table and visual observations at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from 0 to 11.8 ft is archived in core box 1.

Depth (ft)	Graphic log	Lithologic description
5.0		(Continued from last page to 5.3 ft below land surface).
		Interval—5.3 to 5.5 ft below land surface. Silt with fine sand (ML), dark gray (5Y 4/0).
	SP	Interval—5.5 to 7.5 ft below land surface. Fine sand (SP), dark gray (5Y 5/2), some lignite at 7.5 ft.
6.0		
7.0		
	ML	Interval—7.5 to 9.5 ft below land surface. Silt to clayey silt (ML), dark gray (5Y 5/2), slight color change at 8.5 ft to dark gray (5Y 4/1).
8.0		
9.0		
	CL	Interval—9.5 to 11.8 ft below land surface. Silty clay (CL), dark gray (5Y 4/0).
10.0		

Project Anacostia Ground Water
Site name DCHP01
Latitude / Longitude 38° 54' 05.8" / 076° 57' 34.2"
Land-surface elevation 2.75 ft above sea level
Total depth 30.5 ft below land surface

Date drilled 7/2/2002
Date described 7/15/2002
Described by Phelan / Tenbus
Interval 10.0 to 15.0 ft
Drilling method Vibracore

Remarks: Site was on a mud flat on the eastern bank of the Anacostia River in Washington, D.C., north of the Benning bridge. Land-surface elevation was estimated from tide table and visual observations at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from 0 to 11.8 ft is archived in core box 1; core from 11.8 to 18.0 ft is in core box 2.

Depth (ft)	Graphic log	Lithologic description
10.0		(Continued from last page to 11.8 ft below land surface).
	CL	
11.0		
		Interval—11.8 to 12.0 ft below land surface. Sandy clay (SC), same as above with medium sand.
	SC	
12.0		Interval—12.0 to 13.5 ft below land surface. Silty clay (CL), gray (5Y 6/0), stiff, with a gradual transition to very stiff from 13.0 to 13.5 ft.
	CL	
13.0		
		Interval—13.5 to 18.0 ft below land surface. Silty clay (CL), marbled olive and brown, dry, very stiff, becomes hard clay from 17.9 to 18.0 ft.
14.0	CL	
15.0		

Project Anacostia Ground Water
Site name DCHP01
Latitude / Longitude 38° 54' 05.8" / 076° 57' 34.2"
Land-surface elevation 2.75 ft above sea level
Total depth 30.5 ft below land surface

Date drilled 7/2/2002
Date described 7/15/2002
Described by Phelan / Tenbus
Interval 15.0 to 20.0 ft
Drilling method Vibracore

Remarks: Site was on a mud flat on the eastern bank of the Anacostia River in Washington, D.C., north of the Benning bridge. Land-surface elevation was estimated from tide table and visual observations at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from11.8 to 18.0 ft is archived in core box 2; core from 18.0 to 27.5 ft is archived in core box 3.

Depth (ft)	Graphic log	Lithologic description
15.0		(Continued from last page to 18.0 ft below land surface).
16.0	CL	
17.0		
18.0		Interval—18.0 to 19.8 ft below land surface. Clay (CL), gray (5Y 6/0), medium stiff.
	CL	
19.0		
	GM	Interval—19.8 to 24.5 ft below land surface. (See description next page).
20.0		

Project Anacostia Ground Water
Site name DCHP01
Latitude / Longitude 38° 54' 05.8" / 076° 57' 34.2"
Land-surface elevation 2.75 ft above sea level
Total depth 30.5 ft below land surface

Date drilled 7/2/2002
Date described 7/15/2002
Described by Phelan / Tenbus
Interval 20.0 to 25.0 ft
Drilling method Vibracore

Remarks: Site was on a mud flat on the eastern bank of the Anacostia River in Washington, D.C., north of the Benning bridge. Land-surface elevation was estimated from tide table and visual observations at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from 18.0 to 27.5 ft is archived in core box 3.

Depth (ft)	Graphic log	Lithologic description
20.0		
	GM	(continued from last page to 24.5 ft below land surface). Gravel, sand, and silt mixture (GM), variegated color, top is reddish yellow (7.5 YR 6/8), color changes to pale olive (5Y 6/3) from 21.0 to 24.5 ft. Contains cobbles as large as 60 millimeters in diameter.
21.0		
22.0		
23.0		
24.0		
	SC	Interval—24.5 to 24.8 ft below land surface. Sandy clay (SC), variegated.
	GC	Interval—24.8 to 25.0 ft below land surface. Clay, sand, and gravel mix (GC), light yellowish brown (2.5Y 6/4), gravel sizes to 25 millimeters.
25.0		

Project Anacostia Ground Water
Site name DCHP01
Latitude / Longitude 38° 54' 05.8" / 076° 57' 34.2"
Land-surface elevation 2.75 ft above sea level
Total depth 30.5 ft below land surface

Date drilled 7/2/2002
Date described 7/15/2002
Described by Phelan / Tenbus
Interval 25.0 to 30.5 ft
Drilling method Vibracore

Remarks: Site was on a mud flat on the eastern bank of the Anacostia River in Washington, D.C., north of the Benning bridge. Land-surface elevation was estimated from tide table and visual observations at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from 18.0 to 27.5 ft is archived in core box 3; core from 27.5 to 30.5 ft is in core box 4.

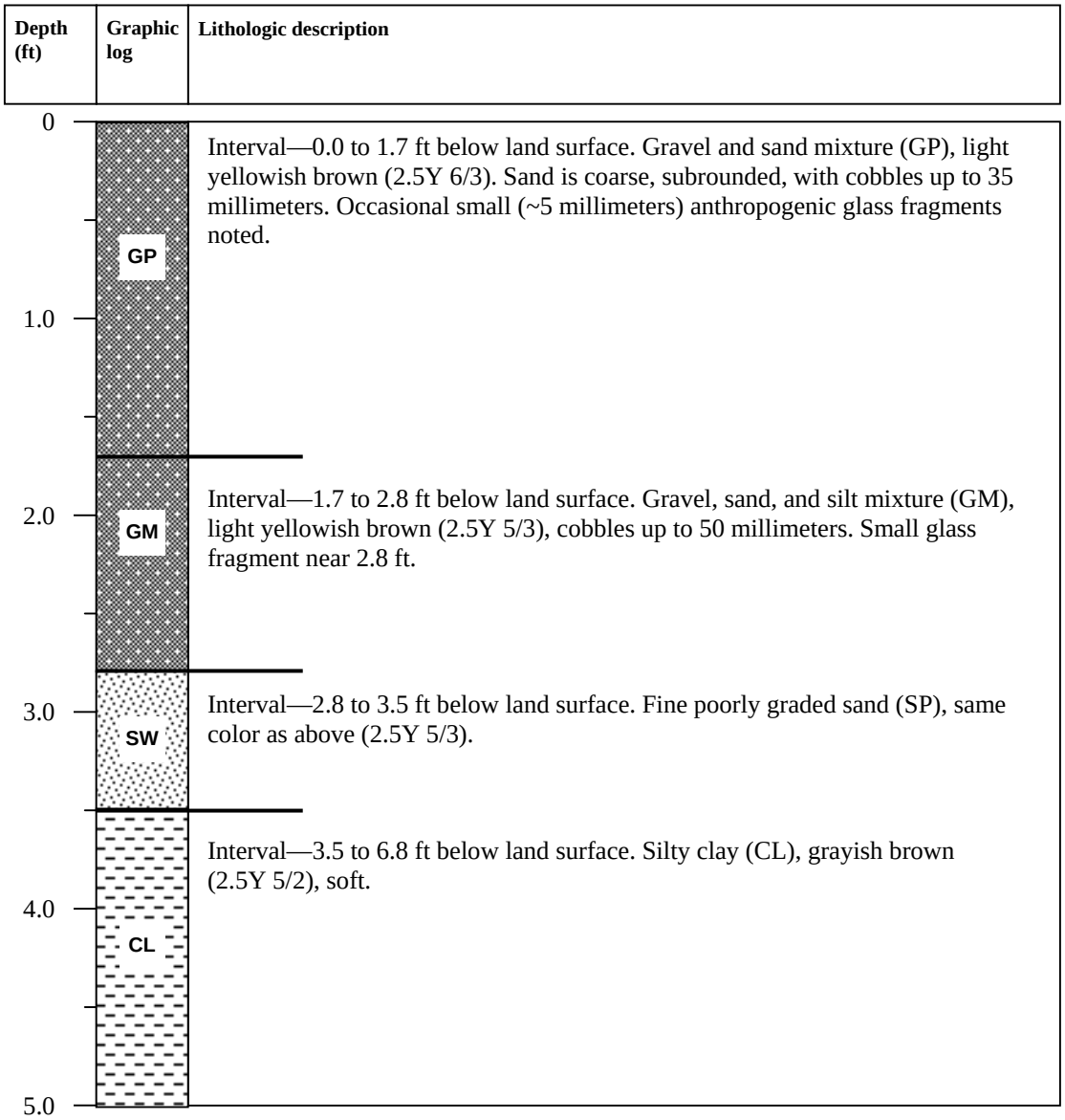
Depth (ft)	Graphic log	Lithologic description
25.0	SC	Interval—25.0 to 26.5 ft below land surface. Sandy clay (SC), pale olive (5Y 6/2).
26.0		
	SP	Interval—26.5 to 29.5 ft below land surface. Poorly graded fine sand (SP), pale olive (5Y 6/2).
27.0		
28.0		
29.0		
	CL	Interval—29.5 to 30.5 ft below land surface. Clay (CL), red and olive marbled, very stiff.
30.0		BOH at 30.5 ft below land surface.

USGS CORING LOG

Project Anacostia Ground Water
Site name DCHP02
Latitude / Longitude 38° 54’ 59.5” / 076° 56’ 34.0”
Land-surface elevation 0.25 ft below sea level
Total depth 27.9 ft below land surface

Date drilled 7/2/2002
Date described 7/16/2002
Described by Phelan / Tenbus
Interval 0.0 to 5.0 ft
Drilling method Vibracore

Remarks: Site was near the southern bank of the Beaverdam Creek stream channel about 150 ft from its confluence with the Anacostia River in Washington, D.C. Land-surface elevation was estimated from tide table and depth measurements at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from 0 to 9.1 ft is archived in core box 1.



Project Anacostia Ground Water
Site name DCHP02
Latitude / Longitude 38° 54' 59.5" / 076° 56' 34.0"
Land-surface elevation 0.25 ft below sea level
Total depth 27.9 ft below land surface

Date drilled 7/2/2002
Date described 7/16/2002
Described by Phelan / Tenbus
Interval 5.0 to 10.0 ft
Drilling method Vibracore

Remarks: Site was near the southern bank of the Beaverdam Creek stream channel about 150 ft from its confluence with the Anacostia River in Washington, D.C. Land-surface elevation was estimated from tide table and depth measurements at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from 0 to 9.1 ft is archived in core box 1; core from 9.1 to 16.5 ft is in core box 2.

Depth (ft)	Graphic log	Lithologic description
5.0		(Continued from last page to 6.8 ft below land surface).
6.0	CL	
7.0	SM	Interval—6.8 to 8.1 ft below land surface. Fine silty sand (SM), color not uniform, generally dark gray to dark olive. Predominantly very dark gray (5Y 3/0).
8.0	SP	Interval—8.1 to 8.7 ft below land surface. Medium clean sand (SP) with lignite chunks (possibly old leafy material), light gray (5Y 7/2).
9.0	CL	Interval—8.7 to 9.1 ft below land surface. Silty clay (CL), very dark gray (5Y 3/0), some lignite.
	GW	Interval—9.1 to 12.0 ft below land surface. Gravel-sand mixture (GW), no silt, color is variable shades of brown and gray, cobbles up to 50 millimeters.
10.0		

Project Anacostia Ground Water
Site name DCHP02
Latitude / Longitude 38° 54' 59.5" / 076° 56' 34.0"
Land-surface elevation 0.25 ft below sea level
Total depth 27.9 ft below land surface

Date drilled 7/2/2002
Date described 7/16/2002
Described by Phelan / Tenbus
Interval 10.0 to 15.0 ft
Drilling method Vibracore

Remarks: Site was near the southern bank of the Beaverdam Creek stream channel about 150 ft from its confluence with the Anacostia River in Washington, D.C. Land-surface elevation was estimated from tide table and depth measurements at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from 9.1 to 16.5 ft is archived in core box 2.

Depth (ft)	Graphic log	Lithologic description
10.0		(Continued from last page to 12.0 ft below land surface).
11.0	GW	
12.0	GW	Interval—12.0 to 13.0 ft below land surface. Gravel-sand mixture (GW), same as above, red (2.5YR 4/8) mixed with pale yellow (2.5Y 7/4).
13.0	SP	Interval—13.0 to 25.2 ft below land surface. Fine poorly graded sand (SP), very pale brown (10YR 7/3), no clay or silt, subrounded grains, with a thin layer of fine sand and gravel, red (2.5YR 4/8) from 14.0 to 14.1 ft below land surface.
14.0		
15.0		

Project Anacostia Ground Water
Site name DCHP02
Latitude / Longitude 38° 54' 59.5" / 076° 56' 34.0"
Land-surface elevation 0.25 ft below sea level
Total depth 27.9 ft below land surface

Date drilled 7/2/2002
Date described 7/16/2002
Described by Phelan / Tenbus
Interval 15.0 to 20.0 ft
Drilling method Vibracore

Remarks: Site was near the southern bank of the Beaverdam Creek stream channel about 150 ft from its confluence with the Anacostia River in Washington, D.C. Land-surface elevation was estimated from tide table and depth measurements at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from 9.1 to 16.5 ft is archived in core box 2; core from 16.5 to 22.5 ft is in core box 3.

Depth (ft)	Graphic log	Lithologic description
15.0		
	SP	(Continued from last page to 25.2 ft below land surface).
16.0		
17.0		
18.0		
19.0		
20.0		

Project Anacostia Ground Water
Site name DCHP02
Latitude / Longitude 38° 54' 59.5" / 076° 56' 34.0"
Land-surface elevation 0.25 ft below sea level
Total depth 27.9 ft below land surface

Date drilled 7/2/2002
Date described 7/16/2002
Described by Phelan / Tenbus
Interval 20.0 to 25.0 ft
Drilling method Vibracore

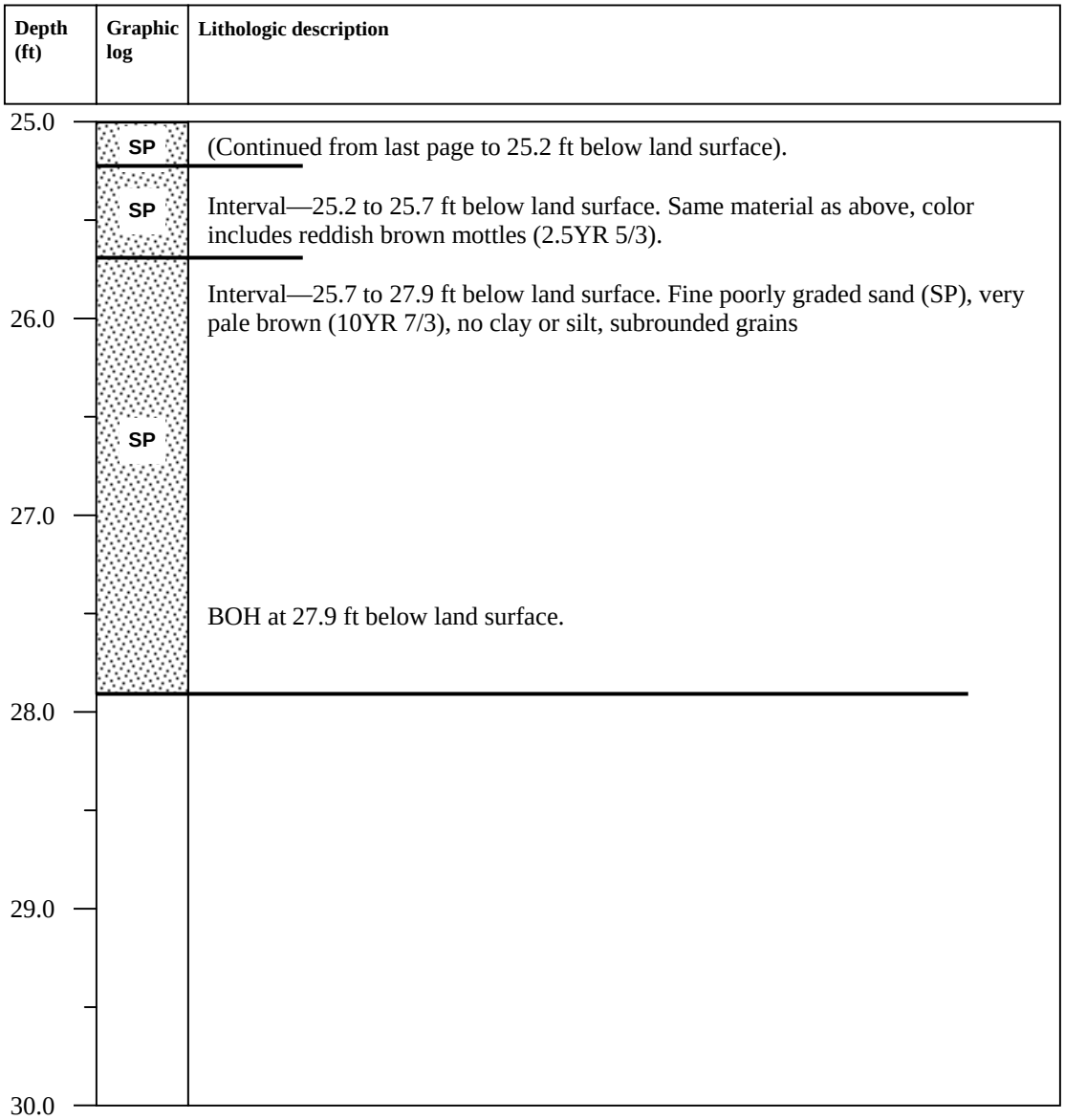
Remarks: Site was near the southern bank of the Beaverdam Creek stream channel about 150 ft from its confluence with the Anacostia River in Washington, D.C. Land-surface elevation was estimated from tide table and depth measurements at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from 16.5 to 22.5 ft is archived in core box 3; core from 22.5 to 27.9 ft is in core box 4.

Depth (ft)	Graphic log	Lithologic description
20.0		
		(Continued from last page to 25.2 ft below land surface).
21.0		
22.0		
	SP	
23.0		
24.0		
25.0		

Project Anacostia Ground Water
Site name DCHP02
Latitude / Longitude 38° 54' 59.5" / 076° 56' 34.0"
Land-surface elevation 0.25 ft below sea level
Total depth 27.9 ft below land surface

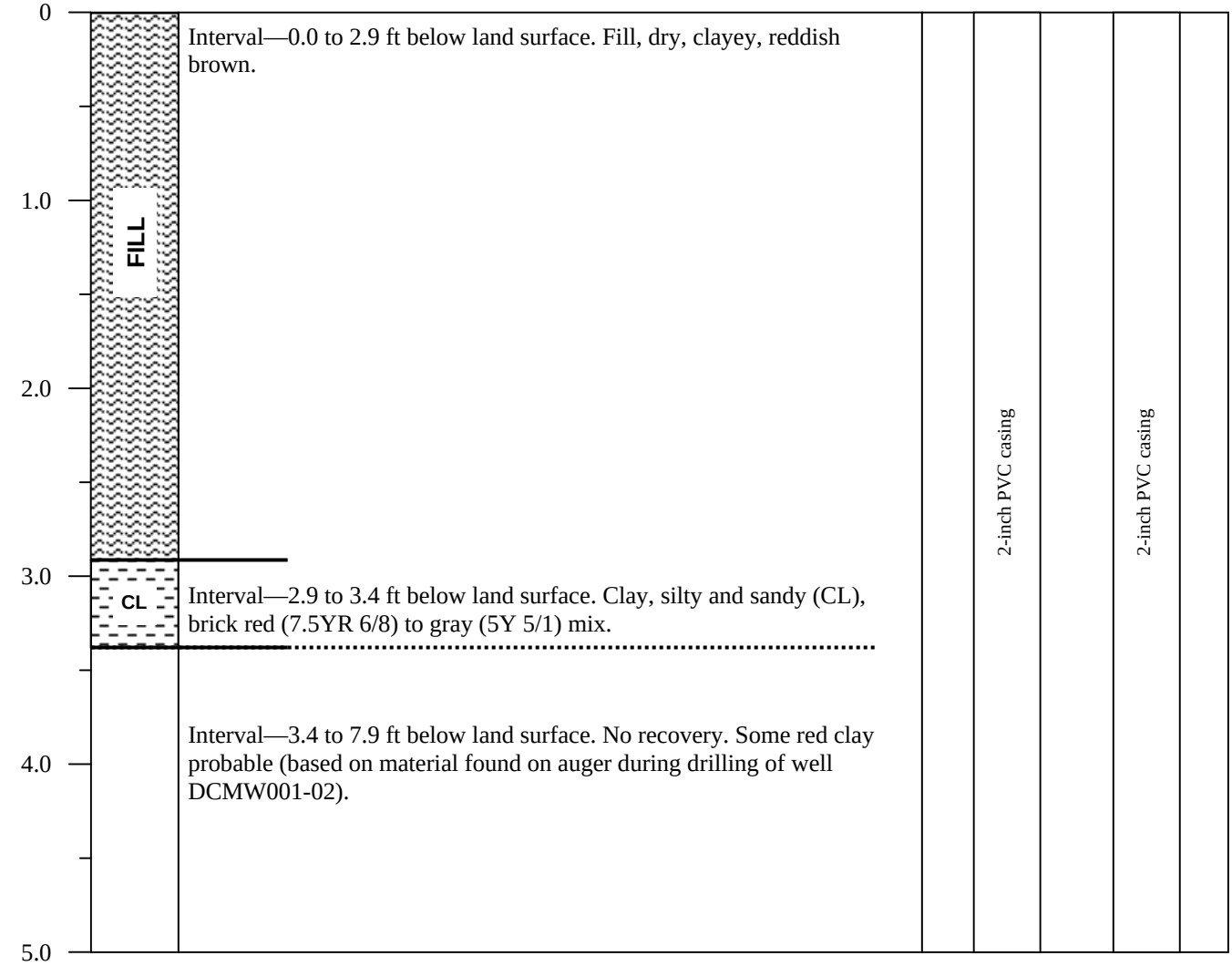
Date drilled 7/2/2002
Date described 7/16/2002
Described by Phelan / Tenbus
Interval 25.0 to 30.5 ft
Drilling method Vibracore

Remarks: Site was near the southern bank of the Beaverdam Creek stream channel about 150 ft from its confluence with the Anacostia River in Washington, D.C. Land-surface elevation was estimated from tide table and depth measurements at the time of drilling. Vibracore method can cause compaction or stretching of cores; accuracy of depths in the descriptions is estimated to be ± 0.3 ft. Core from 22.5 to 27.9 ft is archived in core box 4.



Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55’ 03.6” / 076° 56’ 37.7”	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	0.0 to 5.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 32.9 ft is estimated to be ± 0.3 ft. Core from 0 to 22.9 ft is archived in core box 1.



Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55’ 03.6” / 076° 56’ 37.7”	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	5.0 to 10.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 32.9 ft is estimated to be ± 0.3 ft. Core from 0 to 22.9 ft is archived in core box 1.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW001-02	Well log, DCMW004-02
5.0		(Continued from last page to 7.9 ft below land surface).		
		No recovery.		
6.0				
7.0				
8.0	CL	Interval—7.9 to 17.9 ft below land surface. Interbedded silty clay (CL) and clay (CL), stiff, dark gray (5Y 4/1), with rare fine gravel about 15 millimeters in diameter.	2-inch PVC casing	2-inch PVC casing
9.0				
10.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55' 03.6" / 076° 56' 37.7"	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	10.0 to 15.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

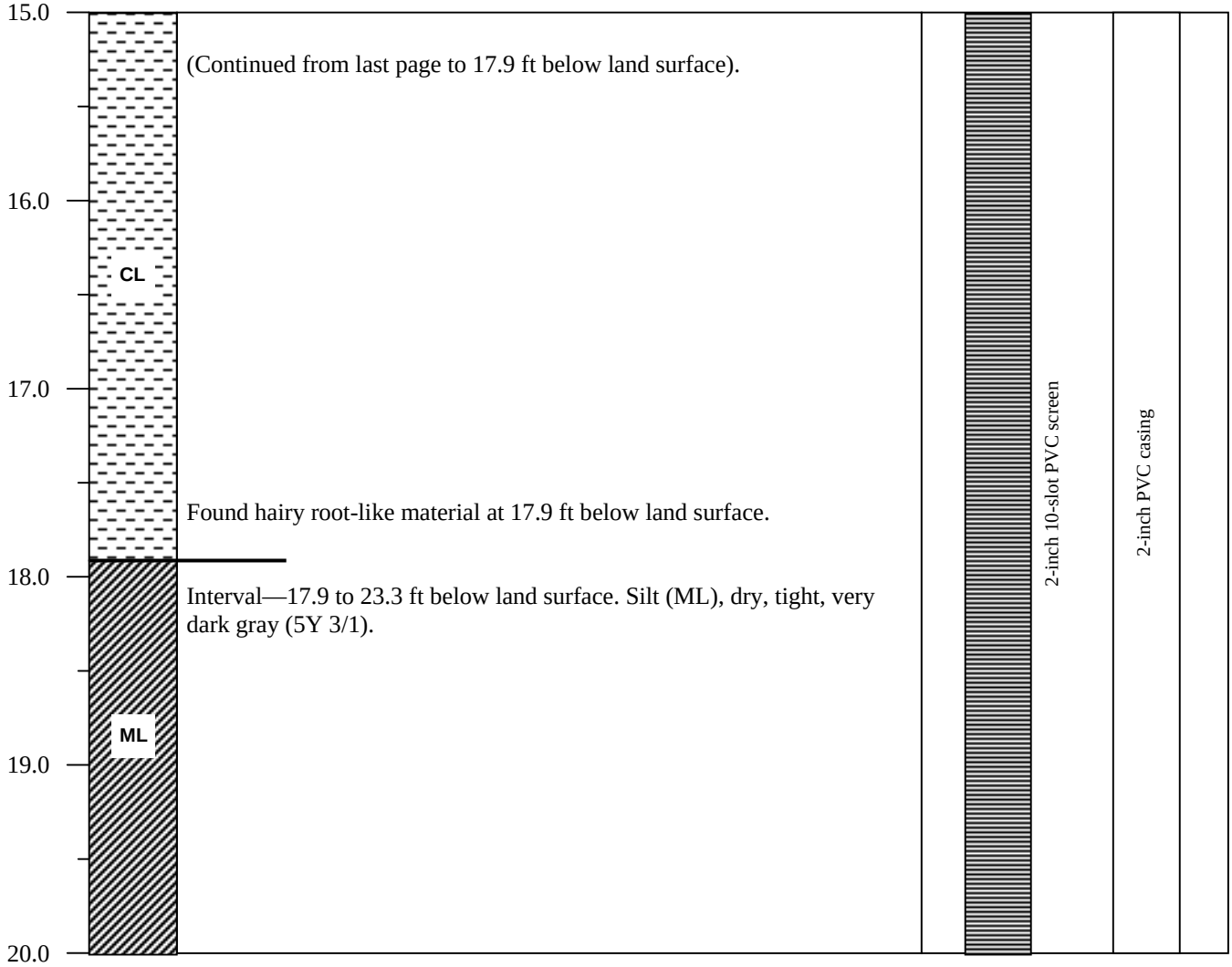
Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 32.9 ft is estimated to be ± 0.3 ft. Core from 0 to 22.9 ft is archived in core box 1.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW001-02	Well log, DCMW004-02
10.0		(Continued from last page to 17.9 ft below land surface).		
11.0				
12.0	CL	Slight color change to very dark gray (5Y 3/1) at 12.0 ft below land surface.	2-inch PVC casing	2-inch PVC casing
13.0		Color change to olive (5Y 5/3) at 12.9 ft below land surface (continues to 17.9 ft below land surface).		
14.0				
15.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55’ 03.6” / 076° 56’ 37.7”	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	15.0 to 20.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

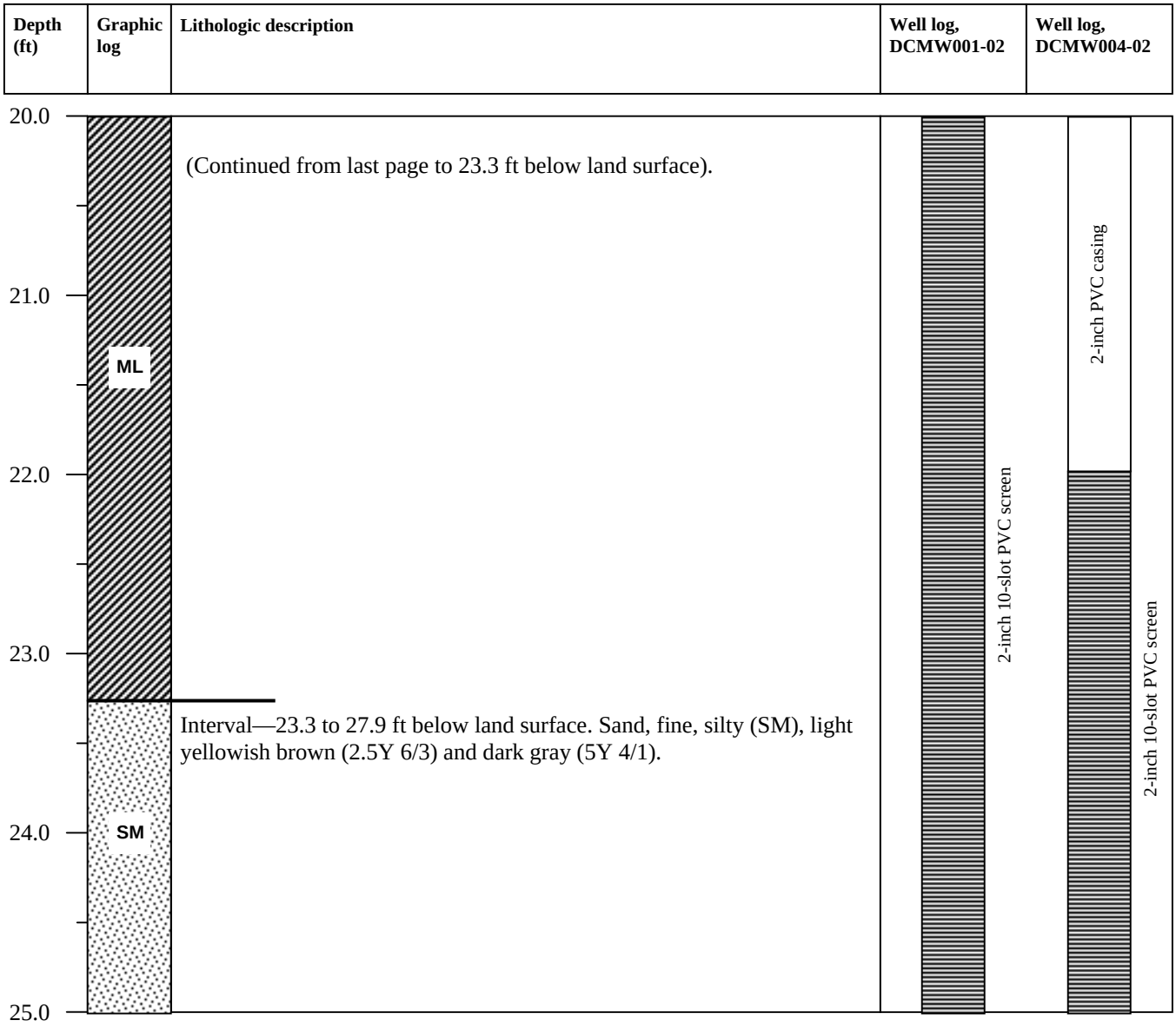
Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 32.9 ft is estimated to be ± 0.3 ft. Well DCMW001-02 is screened at a depth of 15 to 25 ft below land surface. Duplicate soil samples (NYASOIL001-02 and NYASOIL002-02) were collected at a depth of 18 to 23 ft below land surface for chemical quality analysis. Core from 0 to 22.9 ft is archived in core box 1.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW001-02	Well log, DCMW004-02
15.0		(Continued from last page to 17.9 ft below land surface).		
16.0	CL			
17.0		Found hairy root-like material at 17.9 ft below land surface.		
18.0		Interval—17.9 to 23.3 ft below land surface. Silt (ML), dry, tight, very dark gray (5Y 3/1).		
19.0	ML			
20.0				



Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55’ 03.6” / 076° 56’ 37.7”	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	20.0 to 25.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

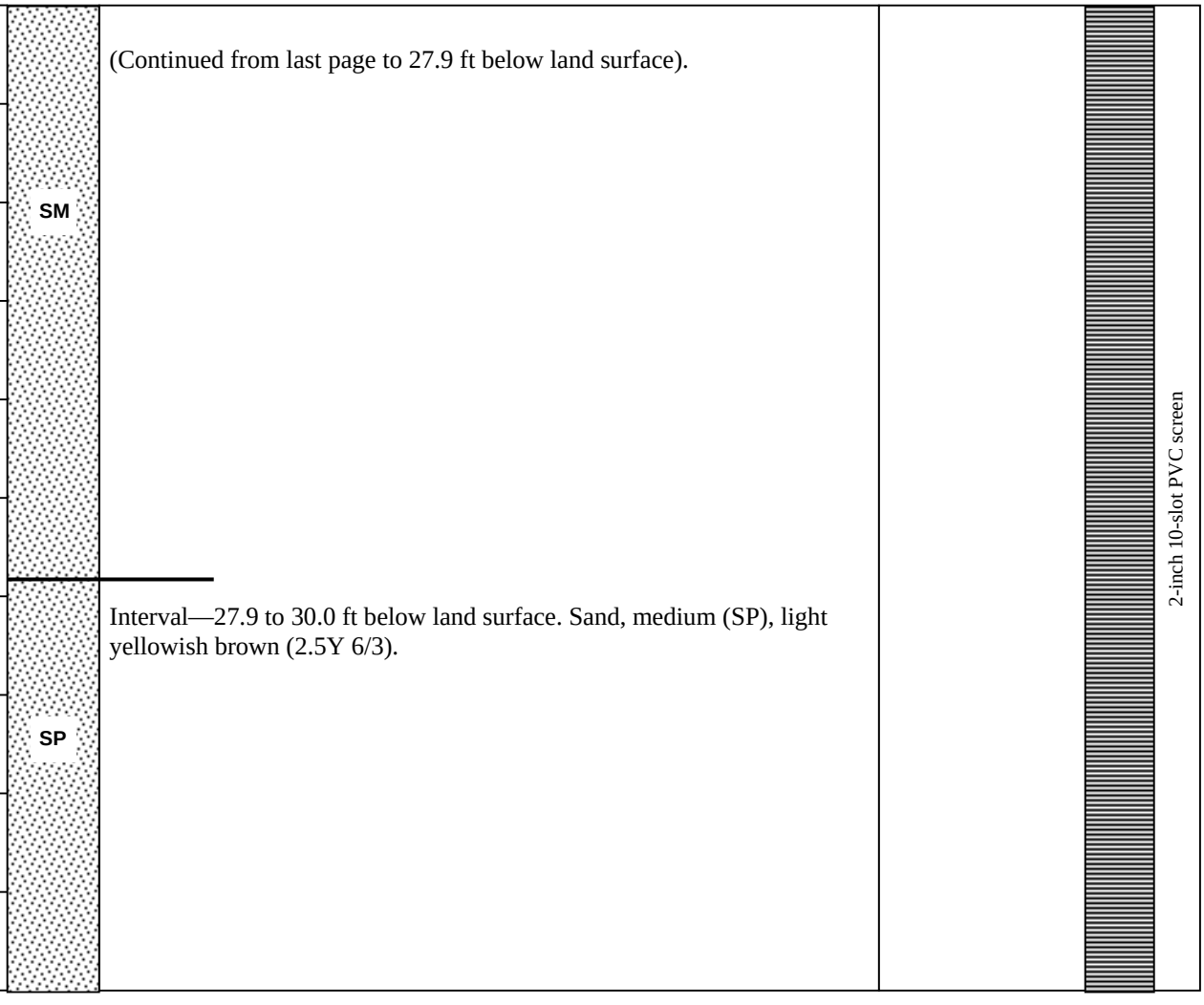
Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 32.9 ft is estimated to be ± 0.3 ft. Well DCMW001-02 is screened at a depth of 15 to 25 ft below land surface, and well DCMW004-02 is screened at a depth of 22 to 32 ft below land surface. Duplicate soil samples (NYASOIL001-02 and NYASOIL002-02) were collected at a depth of 18 to 23 ft below land surface for chemical quality analysis. Core from 0 to 22.9 ft is archived in core box 1; core from 22.9 to 32.9 ft is archived in core box 2.



Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55' 03.6" / 076° 56' 37.7"	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	25.0 to 30.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

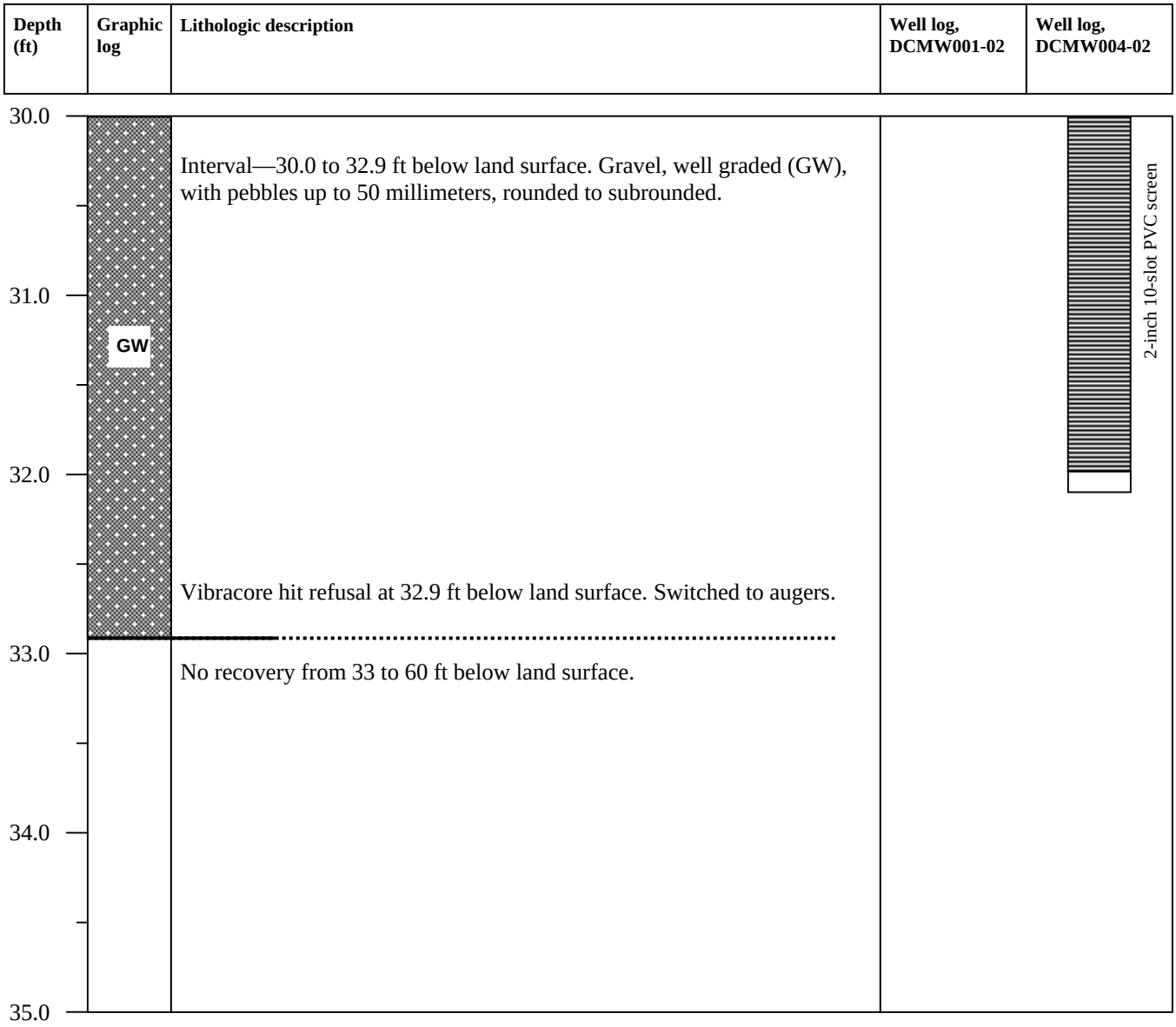
Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 32.9 ft is estimated to be ± 0.3 ft. Well DCMW004-02 is screened at a depth of 22 to 32 ft below land surface. Core from 22.9 to 32.9 ft is archived in core box 2.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW001-02	Well log, DCMW004-02
25.0		(Continued from last page to 27.9 ft below land surface).		
26.0	SM			
27.0				
28.0		Interval—27.9 to 30.0 ft below land surface. Sand, medium (SP), light yellowish brown (2.5Y 6/3).		
29.0	SP			
30.0				



Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55’ 03.6” / 076° 56’ 37.7”	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	30.0 to 35.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 32.9 ft is estimated to be ± 0.3 ft. Augers were used below 32.9 ft; no sample was recovered between 33 and 60 ft below land surface. Well DCMW004-02 is screened at a depth of 22 to 32 ft below land surface. Core from 22.9 to 32.9 ft is archived in core box 2; no core sample was recovered from 33 to 60 ft.



Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55’ 03.6” / 076° 56’ 37.7”	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	35.0 to 40.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; augers were used below that depth. No sample was recovered between 33 and 60 ft below land surface.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW001-02	Well log, DCMW004-02
35.0		No recovery from 33 to 60 ft below land surface.		
36.0				
37.0				
38.0				
39.0				
40.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55’ 03.6” / 076° 56’ 37.7”	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	40.0 to 45.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; augers were used below that depth. No sample was recovered between 33 and 60 ft below land surface.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW001-02	Well log, DCMW004-02
40.0		No recovery from 33 to 60 ft below land surface.		
41.0				
42.0				
43.0				
44.0				
45.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55’ 03.6” / 076° 56’ 37.7”	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	45.0 to 50.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; augers were used below that depth. No sample was recovered between 33 and 60 ft below land surface.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW001-02	Well log, DCMW004-02
45.0		No recovery from 33 to 60 ft below land surface.		
46.0				
47.0				
48.0				
49.0				
50.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55’ 03.6” / 076° 56’ 37.7”	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	50.0 to 55.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; augers were used below that depth. No sample was recovered between 33 and 60 ft below land surface.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW001-02	Well log, DCMW004-02
50.0		No recovery from 33 to 60 ft below land surface.		
51.0				
52.0				
53.0				
54.0				
55.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55’ 03.6” / 076° 56’ 37.7”	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	55.0 to 60.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; augers were used below that depth. No sample was recovered between 33 and 60 ft below land surface.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW001-02	Well log, DCMW004-02
55.0		No recovery from 33 to 60 ft below land surface.		
56.0				
57.0				
58.0				
59.0				
60.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW001-02 and DCMW004-02 (NYAve)	**Date described**	8/16/2002
Latitude / Longitude	38° 55’ 03.6” / 076° 56’ 37.7”	**Described by**	Phelan / Tenbus
Land-surface elevation	13.1 ft above sea level	**Interval**	35.0 to 40.0 ft
Total depth	62 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was uphill of the west bank of the Anacostia River in Washington, D.C., where **New York Avenue** crosses the river. Vibracore method was used until refusal at 32.9 ft; augers were used below that depth. Lithologic description is based on a sample collected from the auger at a depth between 60 and 62 ft below land surface. Core from 60 to 62 ft is archived in core box 2.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW001-02	Well log, DCMW004-02
60.0				
	CL	Approximate interval—60 to 62 ft below land surface. Clay (CL), very stiff, reddish brown (5YR 4/3). Material collected from auger.		
61.0				
		Bottom of hole at 62 ft below land surface.		
62.0				
63.0				
64.0				
65.0				

USGS CORING LOG

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	0.0 to 5.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

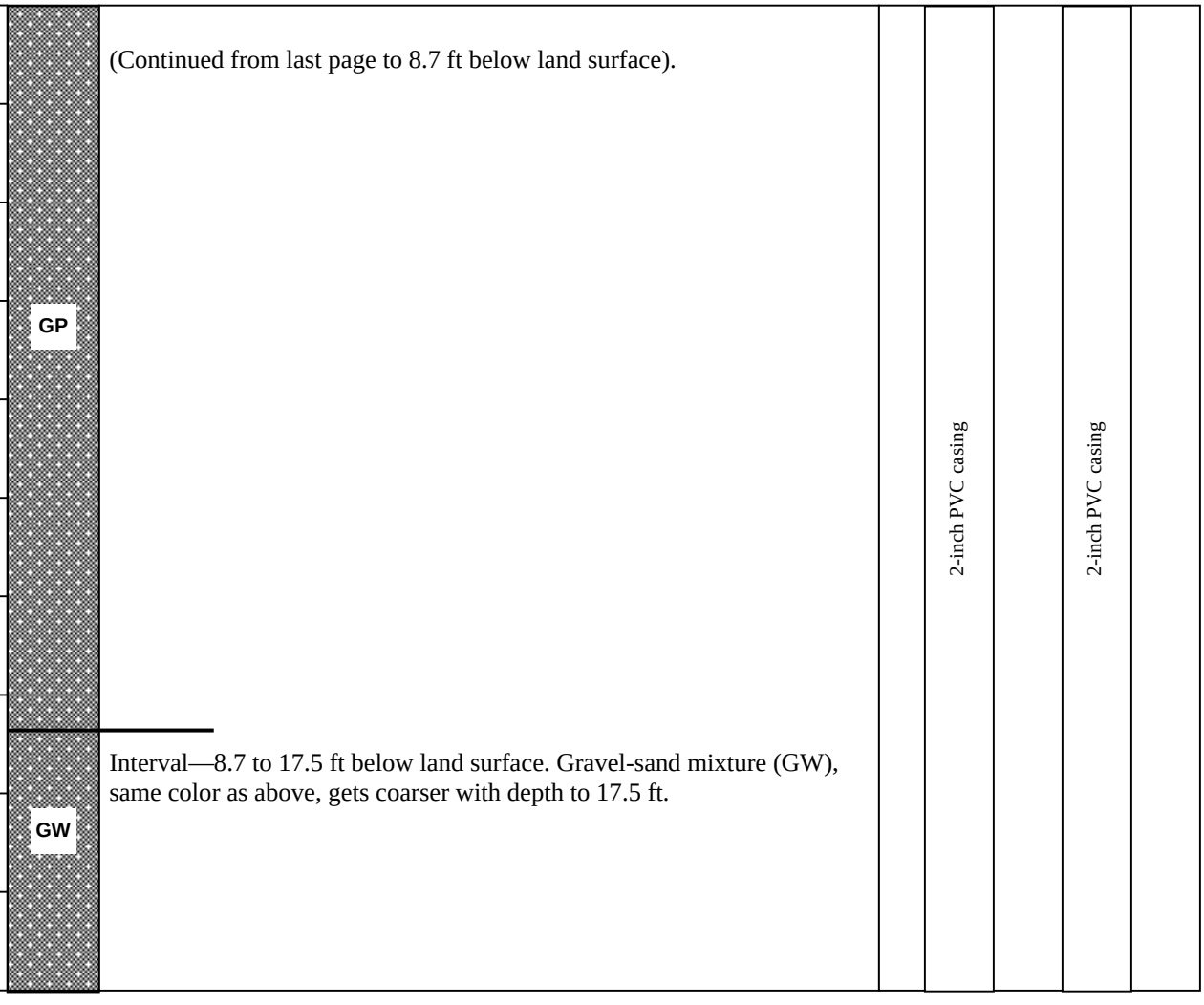
Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 37.2 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 37.2 ft is estimated to be ± 0.3 ft. A soil sample (KAGSOIL001-02) was collected at the surface below the sod layer. Core from 0 to 8.7 ft is archived in core box 1.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW002-02	Well log, DCMW003-02
0	SM	Interval—0.0 to 1.3 ft below land surface. Fine to medium sand (SM) with some silt and pebbles up to 30 millimeters (subrounded to angular), pale yellow (2.5Y 7/4).	2-inch PVC casing (flush mounted at surface)	2-inch PVC casing (flush mounted at surface)
1.0	SW	Interval—1.3 to 3.2 ft below land surface. Sand (SW), pale yellow (2.5Y 7/4), fining upward, with pebbles up to 30 millimeters.		
2.0				
3.0	GW	Interval—3.2 to 4.5 ft below land surface. Gravel-sand mixture (GW), reddish yellow (7.5YR 7/6), little or no fines.		
4.0	GP	Interval—4.5 to 8.7 ft below land surface. Gravel-sand mixture (GP), reddish yellow (7.5YR 7/6), little or no fines.		
5.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	5.0 to 10.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 37.2 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 37.2 ft is estimated to be ± 0.3 ft. Core from 0 to 8.7 ft is archived in core box 1; core from 8.7 to 23.2 ft is archived in core box 2.

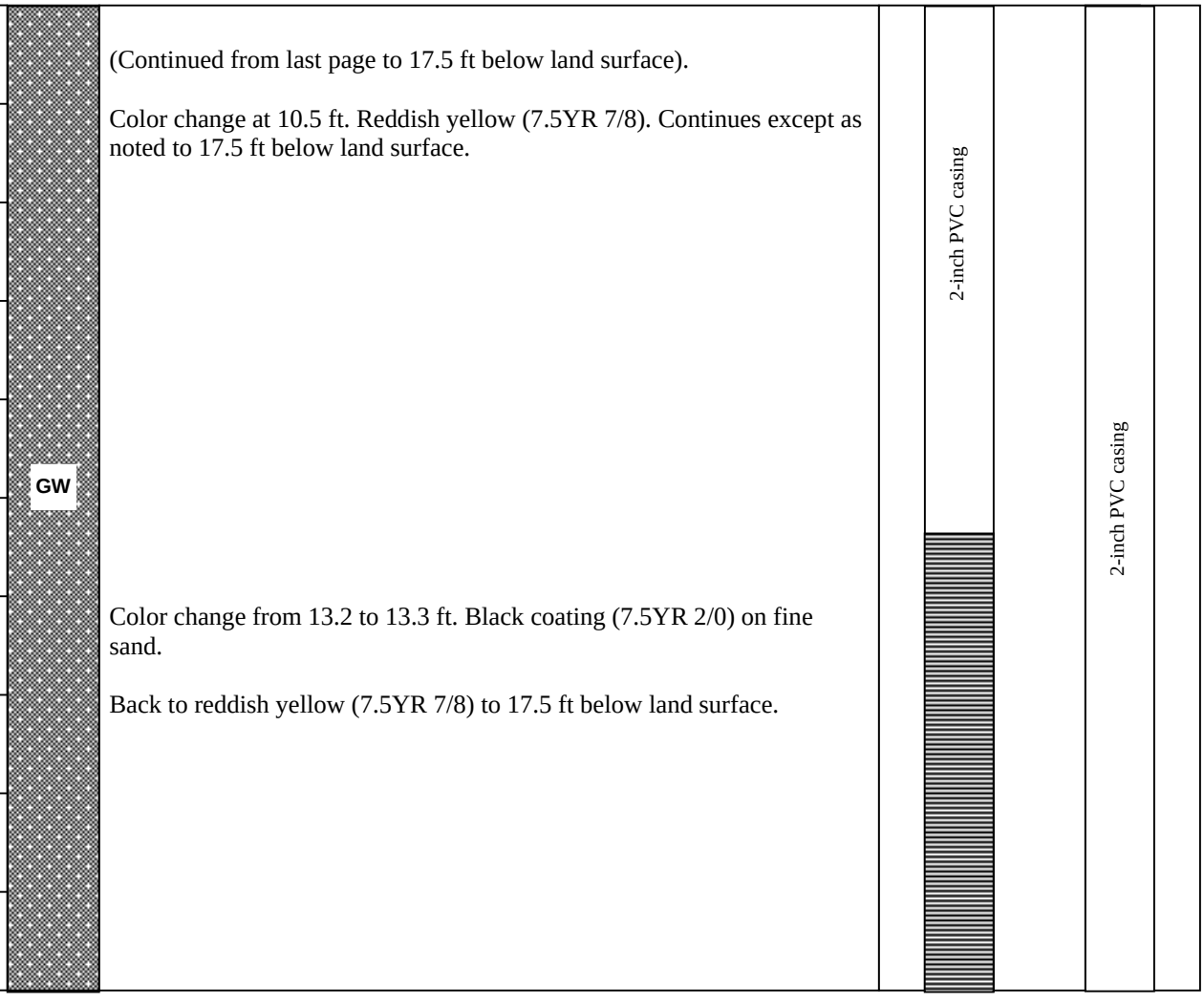
Depth (ft)	Graphic log	Lithologic description	Well log, DCMW002-02	Well log, DCMW003-02
5.0		(Continued from last page to 8.7 ft below land surface).		
6.0	GP			
7.0				
8.0				
9.0	GW	Interval—8.7 to 17.5 ft below land surface. Gravel-sand mixture (GW), same color as above, gets coarser with depth to 17.5 ft.		
10.0				



Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	10.0 to 15.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

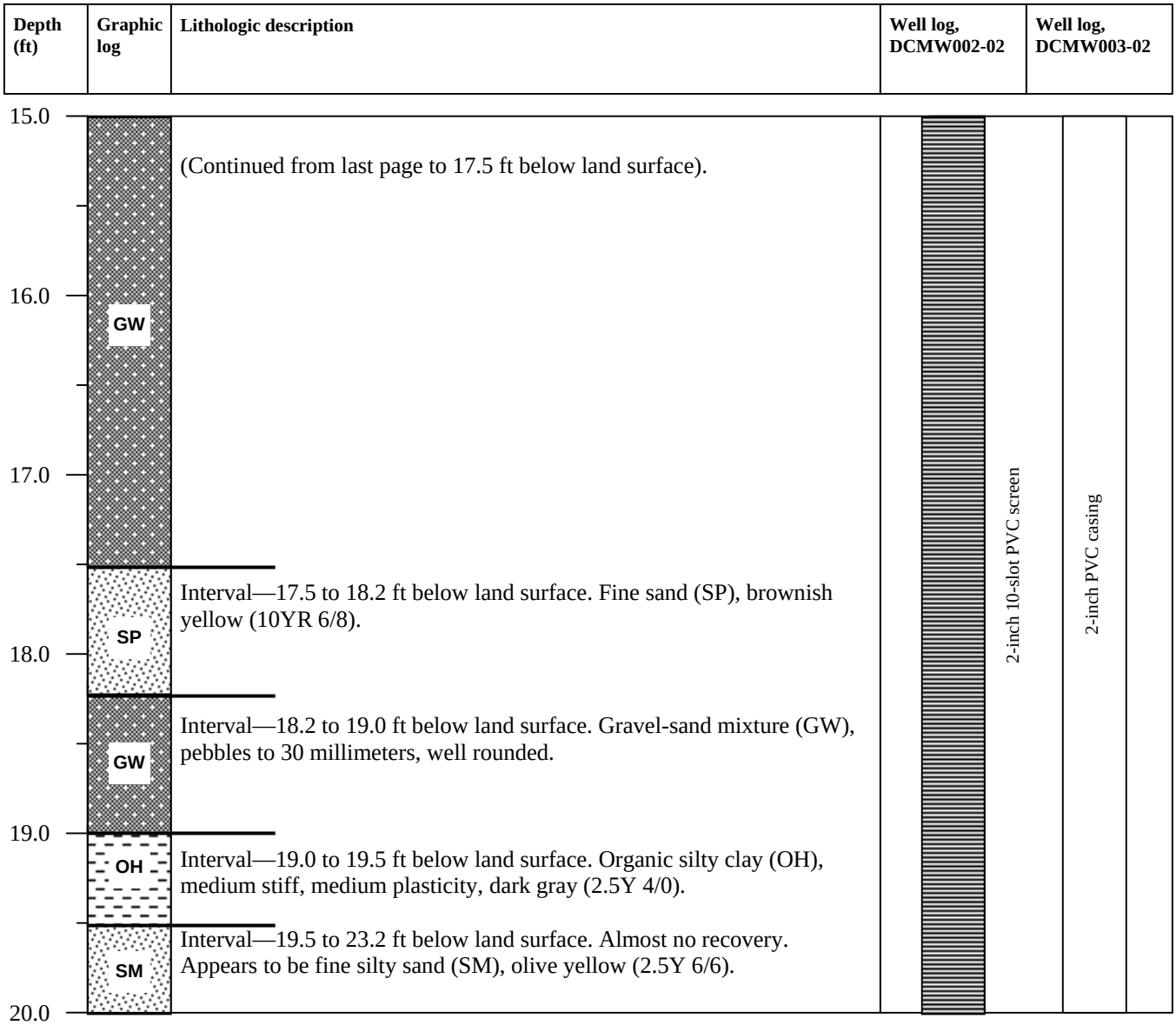
Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 37.2 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 37.2 ft is estimated to be ± 0.3 ft. A soil sample (KAGSOIL002-02) was collected in the interval from 10 to 11 ft below land surface. Well DCMW002-02 was installed with a screened interval of 12.6 to 22.6 ft below land surface. Core from 8.7 to 23.2 ft is archived in core box 2.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW002-02	Well log, DCMW003-02
10.0		(Continued from last page to 17.5 ft below land surface).		
		Color change at 10.5 ft. Reddish yellow (7.5YR 7/8). Continues except as noted to 17.5 ft below land surface.		
11.0				
12.0	GW			
13.0		Color change from 13.2 to 13.3 ft. Black coating (7.5YR 2/0) on fine sand.		
		Back to reddish yellow (7.5YR 7/8) to 17.5 ft below land surface.		
14.0				
15.0				



Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	15.0 to 20.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 37.2 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 37.2 ft is estimated to be ± 0.3 ft. Well DCMW002-02 was installed with a screened interval of 12.6 to 22.6 ft below land surface. Core from 8.7 to 23.2 ft is archived in core box 2.



Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	20.0 to 25.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 37.2 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 37.2 ft is estimated to be ± 0.3 ft. Well DCMW002-02 was installed with a screened interval of 12.6 to 22.6 ft below land surface. Core from 8.7 to 23.2 ft is archived in core box 2; core from 23.2 to 32.2 ft is archived in core box 3.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW002-02	Well log, DCMW003-02
20.0	SM	(Continued from last page to 23.2 ft below land surface).	2-inch 10-slot PVC screen	2-inch PVC casing
21.0				
22.0				
23.0				
	CL	Interval—23.2 to 28.2 ft below land surface. Only 1.3 ft of recovery in this interval. Top part of interval contained inorganic silty clay (CL), light gray (2.5Y 7/2), stiff.		
24.0				
25.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	25.0 to 30.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 37.2 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 37.2 ft is estimated to be ± 0.3 ft. Core from 23.2 to 32.2 ft is archived in core box 3.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW002-02	Well log, DCMW003-02
25.0	CL	(Continued from last page to 28.2 ft below land surface).		2-inch PVC casing
26.0		UNCERTAIN CONTACT DUE TO LIMITED RECOVERY		
27.0	OL	Interval—23.2 to 28.2 ft below land surface, continued. Only 1.3 ft of recovery in this interval. Bottom part of interval contained clayey silt with abundant organic chunks (OL), dark grayish brown (2.5Y 4/2).		
28.0	GC	Interval—28.2 to 29.0 ft below land surface. Gravel-sand-clay mixture (GC), with one 80-millimeter cobble in the core, color is a variegated reddish brown, brown, and gray.		
29.0	ML	Interval—29.0 to 30.6 ft below land surface. Silt (ML), coarse, strong brown (7.5YR 5/6).		
30.0				

USGS CORING LOG

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	30.0 to 35.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 37.2 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 37.2 ft is estimated to be ± 0.3 ft. Core from 23.2 to 32.2 ft is archived in core box 3; core from 32.2 to 37.2 ft is archived in core box 4.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW002-02	Well log, DCMW003-02
30.0	ML	(Continued from last page to 30.6 ft below land surface).		2-inch PVC casing
	ML	Interval—30.6 to 31.2 ft below land surface. Clayey silt (ML), strong brown (7.5YR 5/6).		
31.0	CL	Interval—31.2 to 31.6 ft below land surface. Clay (CL), reddish brown (5YR 4/4), stiff.		
	ML	Interval—31.6 to 33.8 ft below land surface. Silt (ML), coarse, strong brown (7.5YR 5/6), same as 29.0 to 30.6 interval above.		
32.0				
33.0				
34.0	CL	Interval—33.8 to 34.5 ft below land surface. Clay (CL), reddish brown (5YR 4/4), stiff, same as 31.2 to 31.6 interval above.		
	ML	Interval—34.5 to 35.6 ft below land surface. Clayey silt (ML), strong brown (7.5YR 5/6), same as 30.6 to 31.2 interval above. Gets coarser at the bottom of the interval.		
35.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	35.0 to 40.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

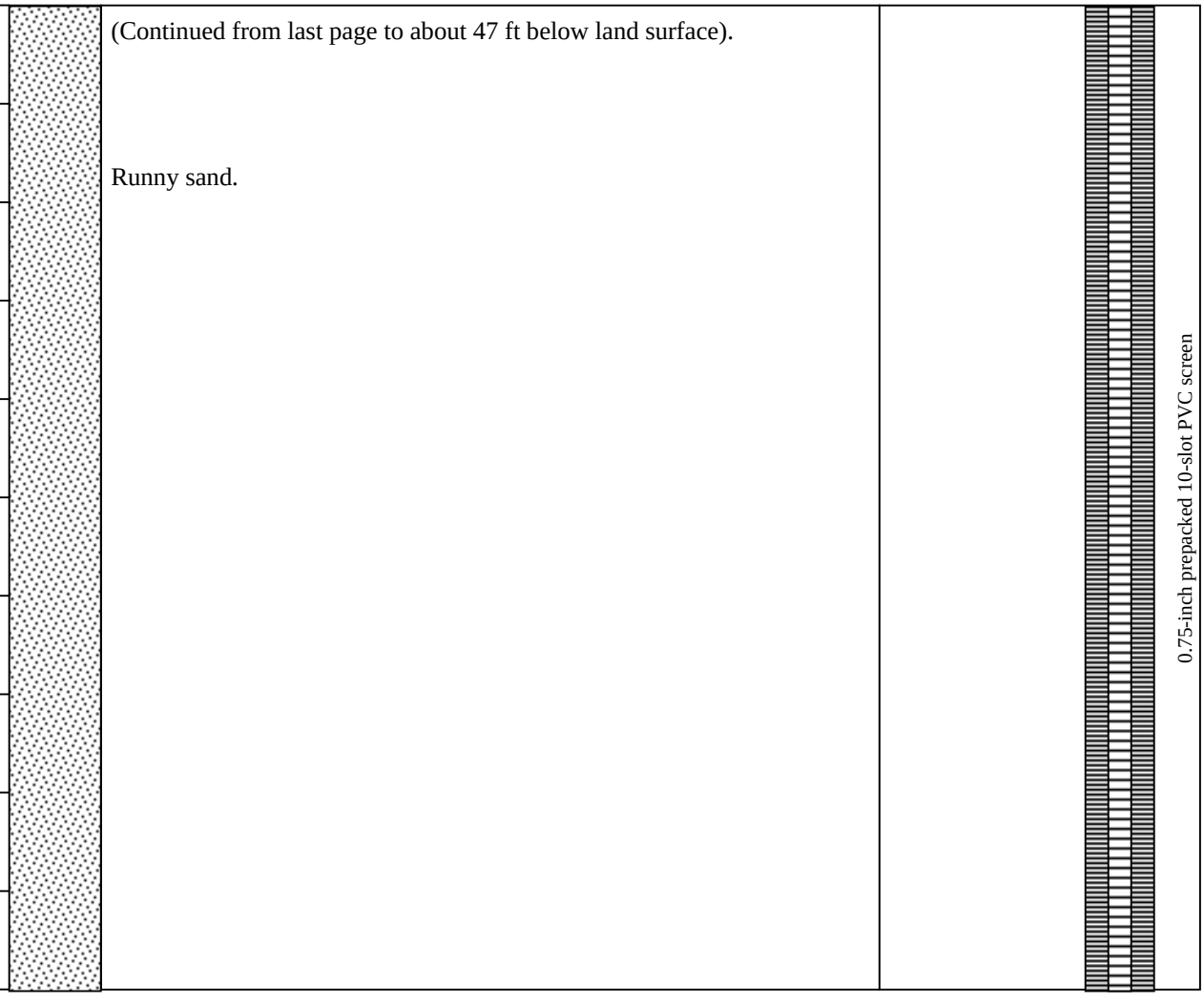
Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 37.2 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 37.2 ft is estimated to be ± 0.3 ft. Well DCMW003-02 was installed with a screened interval of 36.3 to 46.3 ft below land surface. Core from 32.2 to 37.2 ft is archived in core box 4; no samples from 37.2 to 47 ft were collected for archiving.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW002-02	Well log, DCMW003-02
35.0	ML	(Continued from last page to 35.6 ft below land surface).		2-inch PVC casing
	CL	Interval—35.6 to 36.0 ft below land surface. Clay (CL), reddish brown (5YR 4/4), stiff, same as 31.2 to 31.6 and 33.8 to 34.5 intervals above.		
36.0	ML	Interval—36.0 to 37.2 ft below land surface. Silt (ML), coarse, strong brown (7.5YR 5/6), same as 29.0 to 30.6 and 31.6 to 33.8 intervals above.		
37.0		Vibracore hit refusal at 37.2 ft below land surface. Switched to augers.		
		Break in sampling interval because of vibracore refusal at 37.2 ft below land surface. General descriptions are provided below based on material found on the augers between 37.2 and the bottom of hole at 57 ft below land surface.		
38.0		Approximate interval—37 to 47 ft below land surface. Runny sand.		
39.0				0.75-inch prepacked 10-slot PVC screen
40.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	40.0 to 45.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

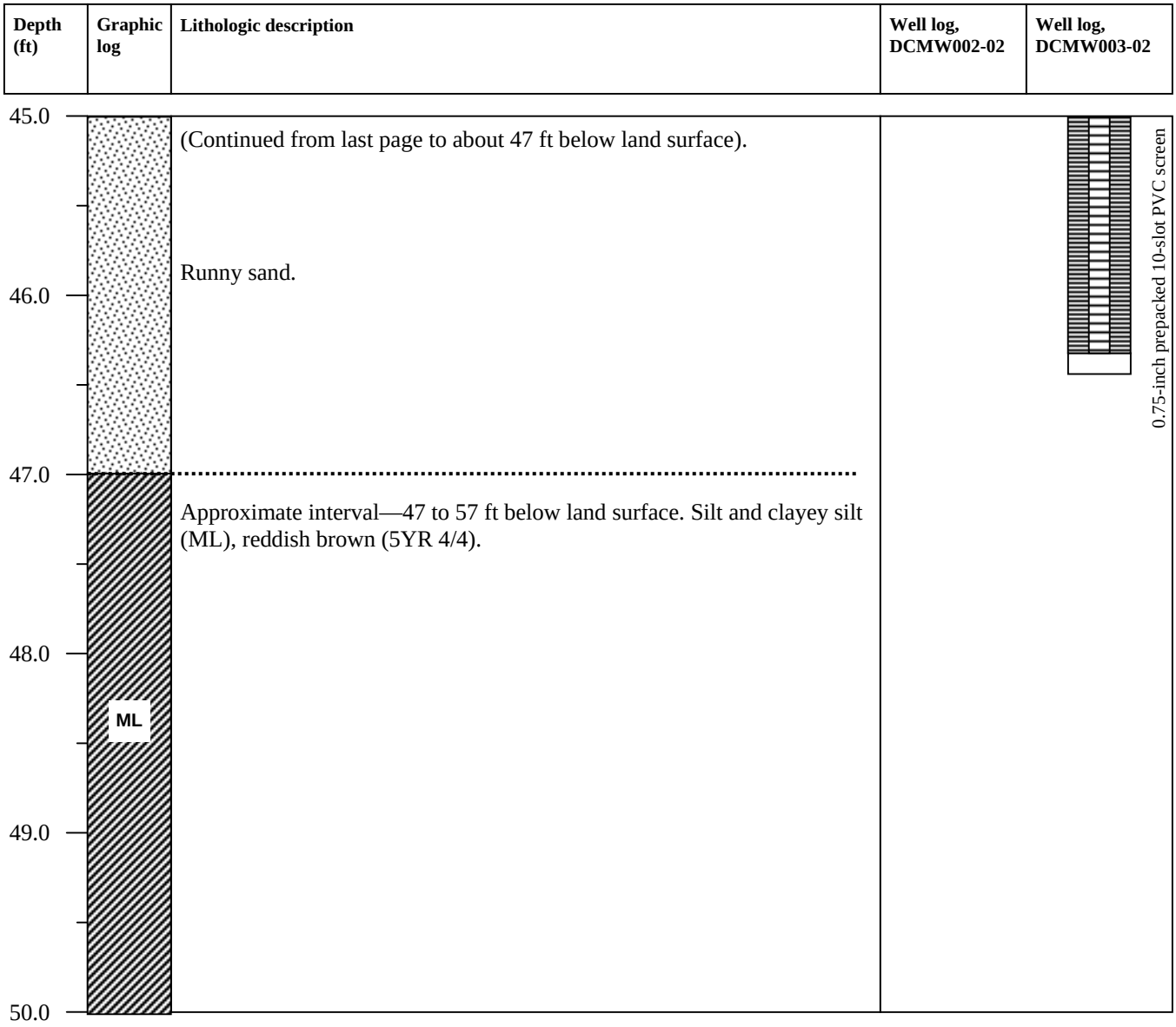
Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Lithologic descriptions are based on incomplete samples found on augers between 37.2 ft and the bottom of the hole at 57 ft below land surface. Well DCMW003-02 was installed with a screened interval of 36.3 to 46.3 ft below land surface. No samples from 37.2 to 47 ft were collected for archiving.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW002-02	Well log, DCMW003-02
40.0		(Continued from last page to about 47 ft below land surface).		
		Runny sand.		
41.0				
42.0				
43.0				
44.0				
45.0				



Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	45.0 to 50.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Lithologic descriptions are based on incomplete samples found on augers between 37.2 ft and the bottom of the hole at 57 ft below land surface. Well DCMW003-02 was installed with a screened interval of 36.3 to 46.3 ft below land surface. No samples from 37.2 to 47 ft were collected for archiving; auger sample from 47 to 57 ft is archived in core box 5.



Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	50.0 to 55.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Lithologic descriptions are based on incomplete samples found on augers between 37.2 ft and the bottom of the hole at 57 ft below land surface. Auger sample from 47 to 57 ft is archived in core box 5.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW002-02	Well log, DCMW003-02
50.0		(Continued from last page to bottom of hole at 57 ft below land surface).		
		Silt and clayey silt (ML), reddish brown (5YR 4/4).		
51.0				
52.0				
	ML			
53.0				
54.0				
55.0				

Project	Anacostia Ground Water	**Date drilled**	7/25/2002
Site name	DCMW002-02 and DCMW003-02 (KAG)	**Date described**	8/16/2002
Latitude / Longitude	38° 54’ 43.5” / 076° 56’ 28.4”	**Described by**	Phelan / Tenbus
Land-surface elevation	19.5 ft above sea level	**Interval**	55.0 to 57.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Kenilworth Aquatic Gardens** (KAG) near the Anacostia River in Washington, D.C. Lithologic descriptions are based on incomplete samples found on augers between 37.2 ft and the bottom of the hole at 57 ft below land surface.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW002-02	Well log, DCMW003-02
55.0		(Continued from last page to bottom of hole at 57 ft below land surface).		
	ML	Silt and clayey silt (ML), reddish brown (5YR 4/4).		
56.0				
		Bottom of hole at 57.0 ft below land surface.		
57.0				
58.0	No sample collected			
59.0				
60.0				

Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	0.0 to 5.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 38.5 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 38.5 ft is estimated to be ± 0.3 ft. A soil sample (APSOIL001-02) was collected at the surface below the sod layer. Core from 0 to 14.7 ft is archived in core box 1.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW005-02
0	FILL	Interval—0.0 to 14.4 ft below land surface. Probable fill. Mostly clay mixed with stones, bricks, and debris. Clay is very stiff and dry.	2-inch PVC casing (flush mounted at surface)
1.0			
2.0			
3.0			
4.0			
5.0			

Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	5.0 to 10.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 38.5 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 38.5 ft is estimated to be ± 0.3 ft. Core from 0 to 14.7 ft is archived in core box 1.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW005-02
5.0			
6.0	FILL	(Continued from last page to 14.4 ft below land surface).	2-inch PVC casing
7.0			
8.0			
9.0			
10.0			

Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	10.0 to 15.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 38.5 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 38.5 ft is estimated to be ± 0.3 ft. Core from 0 to 14.7 ft is archived in core box 1; core from 14.7 to 28.5 ft is archived in core box 2.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW005-02
10.0			
	FILL	(Continued from last page to 14.4 ft below land surface).	2-inch PVC casing
11.0			
12.0			
13.0			
14.0			
	CL	Interval—14.4 to 20.5 ft below land surface. Clay or silty clay (CL), interbedded grayish brown (2.5Y 5/2) to very dark gray (5Y 3/1).	
15.0			

Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	15.0 to 20.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 38.5 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 38.5 ft is estimated to be ± 0.3 ft. Core from 14.7 to 28.5 ft is archived in core box 2.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW005-02
15.0			
16.0	CL	(Continued from last page to 20.5 ft below land surface).	2-inch PVC casing
17.0			
18.0			
19.0			
20.0			

Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	20.0 to 25.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 38.5 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 38.5 ft is estimated to be ± 0.3 ft. Core from 14.7 to 28.5 ft is archived in core box 2.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW005-02
20.0	CL	(Continued from last page to 20.5 ft below land surface).	
		Interval—20.5 to 25.0 ft below land surface. Clay (CL), grayish brown (2.5 Y 5/2), soft. Some silty clay and organic matter (sticks) in middle of interval. Sticks are black, but not really decayed or fossilized.	
21.0			
22.0			
	CL		
23.0			
24.0			
25.0			2-inch PVC casing

Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	25.0 to 30.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 38.5 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 38.5 ft is estimated to be ± 0.3 ft. Core from 14.7 to 28.5 ft is archived in core box 2; core from 28.5 to 42 ft is archived in core box 3.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW005-02
25.0			
	OH	Interval—25.0 to 38.5 ft below land surface. Organic clay (OH), dark olive gray (5Y 3/2), stiff, appears to be low plasticity (fell apart into chunks).	2-inch PVC casing
26.0			
27.0			
28.0			
29.0			
30.0			

Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	30.0 to 35.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

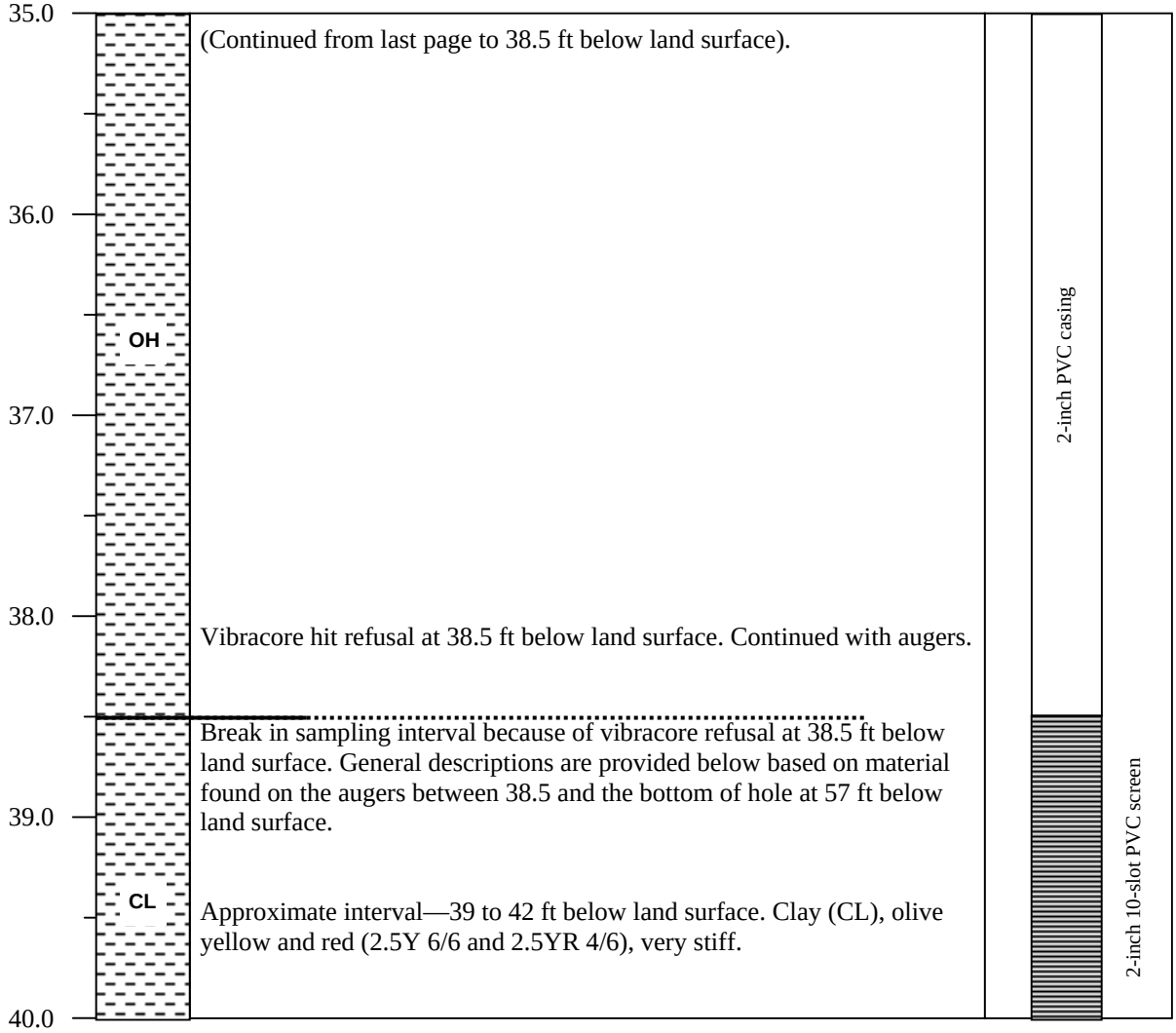
Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 38.5 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 38.5 ft is estimated to be ± 0.3 ft. Core from 28.5 to 42 ft is archived in core box 3.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW005-02
30.0		(Continued from last page to 38.5 ft below land surface).	
31.0			
32.0			2-inch PVC casing
	OH		
33.0			
34.0			
35.0			

Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	35.0 to 40.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

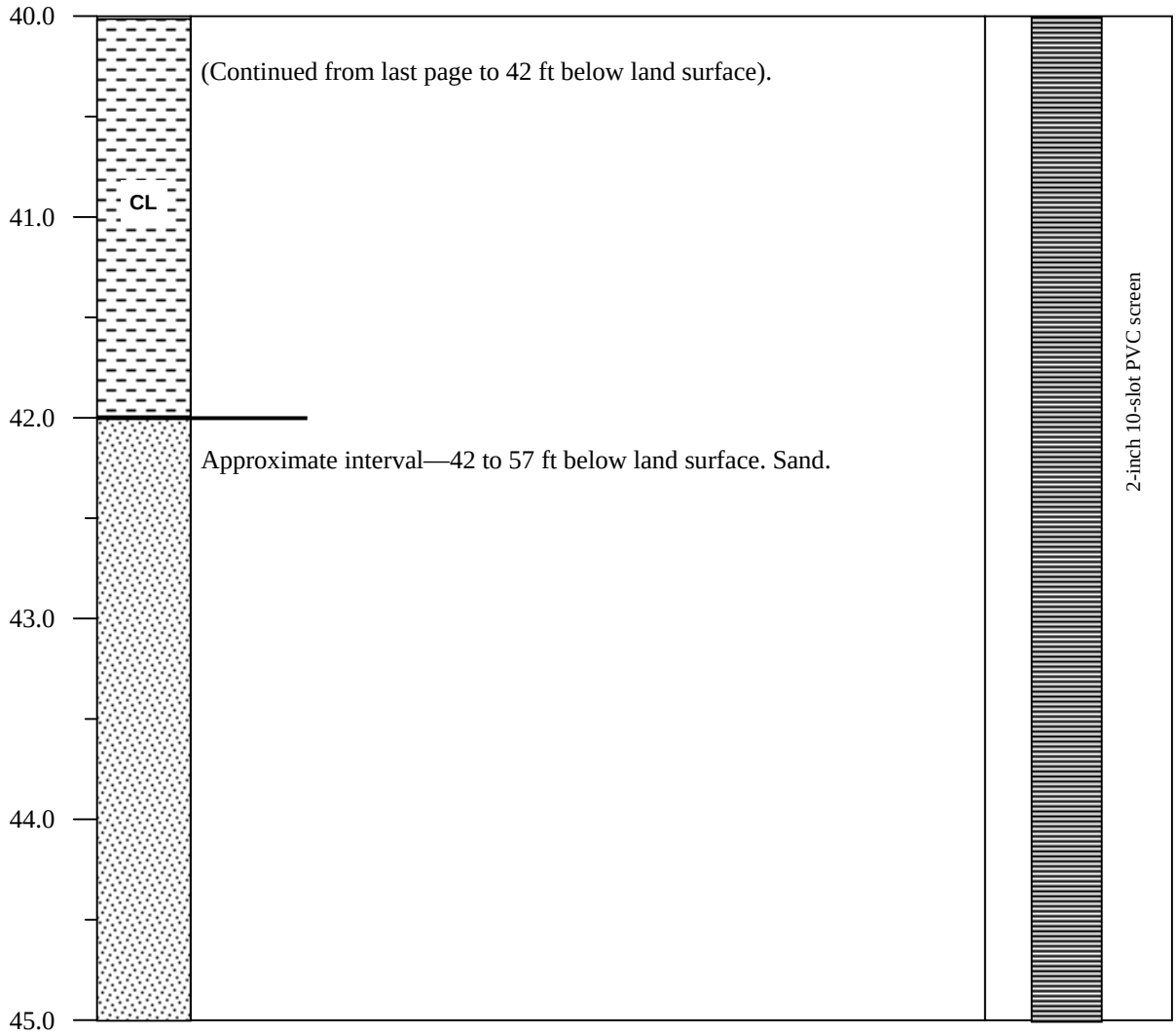
Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Vibracore method was used until refusal at 38.5 ft; this method can cause compaction or stretching of cores, and the accuracy of depths in the descriptions to 38.5 ft is estimated to be ± 0.3 ft. Lithologic descriptions in below 38.5 ft are based on incomplete samples found on augers. Well DCMW005-02 was installed with a screened interval of 38.5 to 48.5 ft below land surface. A soil sample (APSOIL002-02) was collected in the interval from 37.5 to 38.5 ft below land surface. Core from 28.5 to 42 ft is archived in core box 3.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW005-02
35.0		(Continued from last page to 38.5 ft below land surface).	
36.0	OH		
37.0			
38.0		Vibracore hit refusal at 38.5 ft below land surface. Continued with augers.	
		Break in sampling interval because of vibracore refusal at 38.5 ft below land surface. General descriptions are provided below based on material found on the augers between 38.5 and the bottom of hole at 57 ft below land surface.	
39.0	CL	Approximate interval—39 to 42 ft below land surface. Clay (CL), olive yellow and red (2.5Y 6/6 and 2.5YR 4/6), very stiff.	
40.0			



Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	40.0 to 45.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

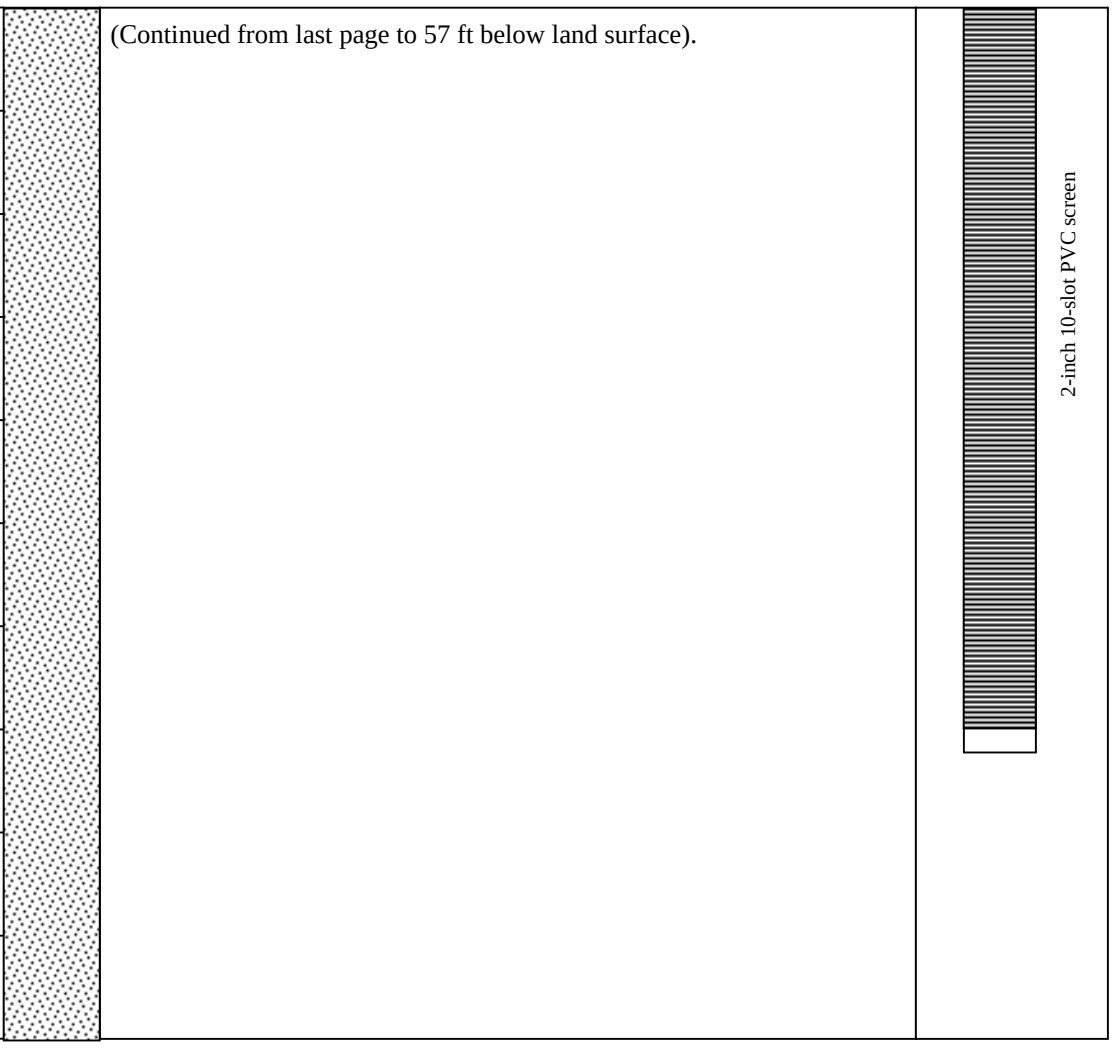
Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Lithologic descriptions in this interval are based on incomplete samples found on augers between 38.5 ft and the bottom of the hole at 57 ft below land surface. Well DCMW005-02 was installed with a screened interval of 38.5 to 48.5 ft below land surface. Core and auger sample from 28.5 to 42 ft is archived in core box 3; no lithologic samples below a depth of 42 ft were archived.



Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	45.0 to 50.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Well DCMW005-02 was installed with a screened interval of 38.5 to 48.5 ft below land surface. Lithologic descriptions in this interval are based on incomplete samples found on augers between 38.5 ft and the bottom of the hole at 57 ft below land surface. No lithologic samples below a depth of 42 ft were archived.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW005-02
45.0		(Continued from last page to 57 ft below land surface).	
46.0			
47.0			
48.0			
49.0			
50.0			



Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	50.0 to 55.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Lithologic descriptions in this interval are based on incomplete samples found on augers between 38.5 ft and the bottom of the hole at 57 ft below land surface. No lithologic samples below a depth of 42 ft were archived.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW005-02
50.0		(Continued from last page to 57 ft below land surface).	
51.0			
52.0			
53.0			
54.0			
55.0			

Project	Anacostia Ground Water	**Date drilled**	7/29/2002
Site name	DCMW005-02 (Anacostia Pk)	**Date described**	8/16/2002
Latitude / Longitude	38° 52’ 38.4” / 076° 58’ 15.3”	**Described by**	Phelan / Tenbus
Land-surface elevation	14.2 ft above sea level	**Interval**	55.0 to 60.0 ft
Total depth	57 ft below land surface	**Drilling method**	Vibracore / auger

Remarks: Site was in **Anacostia Park** near the Anacostia River in Washington, D.C. Lithologic descriptions in this interval are based on incomplete samples found on augers between 38.5 ft and the bottom of the hole at 57 ft below land surface. No lithologic samples below a depth of 42 ft were archived.

Depth (ft)	Graphic log	Lithologic description	Well log, DCMW005-02
55.0		(Continued from last page to 57 ft below land surface).	
56.0			
		Bottom of hole at 57 ft below land surface.	
57.0			
58.0			
59.0			
60.0			