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Detailed Sections from Auger Holes in the Emporia 1:100,000-Scale Quadrangle, North Carolina and Virginia

By Robert E. Weems, J. Stephen Schindler, and William C. Lewis

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Cover: Sediments from the upper part of the Yorktown Formation (Pliocene) at the Old Hickory Heavy Mineral Deposit, located west of Stony Creek, Va. This exposure no longer exists because it has been reclaimed. Natural outcrops of coastal plain sediments are uncommon in the Emporia quadrangle; hence the need for borehole data, as published in this report. Photograph by J. Stephen Schindler, U.S. Geological Survey.

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Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
	Length	
inch (in)	2.54	centimeter (cm)
inch (in)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
mile, nautical (nmi)	1.852	kilometer (km)
yard (yd)	0.9144	meter (m)

SI to Inch/Pound

Multiply	By	To obtain
	Length	
centimeter (cm)	0.3937	inch (in.)
millimeter (mm)	0.03937	inch (in.)
meter (m)	3.281	foot (ft)
kilometer (km)	0.6214	mile (mi)
kilometer (km)	0.5400	mile, nautical (nmi)
meter (m)	1.094	yard (yd)

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Introduction

The Emporia 1:100,000-scale quadrangle straddles the Tidewater Fall Line in southern Virginia and includes a small part of northernmost North Carolina (fig. 1). Sediments of the coastal plain underlie the eastern three-fifths of this area. These sediments onlap crystalline basement rocks toward the west and dip gently to the east, reaching a maximum known thickness of 821 feet (ft) in the extreme southeastern part of the map area (fig. 2). The gentle eastward dip is disrupted in several areas due to faulting delineated during the course of mapping.

In order to produce a new geologic map of the Emporia 1:100,000-scale quadrangle, the U.S. Geological Survey drilled one corehole to a depth of 223 ft and augered 192 shallow research test holes (maximum depth 135 ft) to supplement sparse outcrop data available from the coastal plain part of the map area. The recovered sediments were studied and data from them recorded to determine the lithologic characteristics, spatial distribution, and temporal framework of the represented coastal plain stratigraphic units. These test holes were critical for accurately determining the distribution of major geologic units and the position of unit boundaries that will be shown on the forthcoming Emporia geologic map, but much of the detailed subsurface data cannot be shown readily through this map product. Therefore, the locations and detailed descriptions of the auger test holes and one corehole are provided in this open-file report for geologists, hydrologists, engineers, and community planners in need of a detailed shallow-subsurface stratigraphic framework for much of the Emporia map region.

Methods

Surface elevations for each drill site were obtained by hand leveling from a locality of known elevation, commonly a bench mark or spot elevation point on the appropriate 7.5-minute quadrangle. At each test site, lithologic data were gathered by augering with a truck-mounted, Mobile Drill B–40 power auger, using 5-ft drill stem sections. At first, one stem was augered into the ground and pulled to describe the soil profile. Subsequent runs added one, two, or three new stems, depending on depth and on how easily the augering proceeded. For greater accuracy, we attempted to keep sample rise on the drill stems to a minimum.

Along the Tidewater Fall Line (Weems, 1998), most auger holes targeted either the Lower Cretaceous Patuxent Formation or saprolite overlying basement rocks where the Patuxent Formation was absent. Occasionally at the base of the coastal plain section, the drill bit would not penetrate the underlying rock (here termed “refusal”). Generally, the nature of this rock could be inferred either by small chips on the end of the drill bit or by comparison to nearby outcrops or auger holes. Lithologic descriptions were made with the aid of a 10X hand lens, grain-size chart, and color charts.

Stratigraphy

A full listing of stratigraphic names used herein, their ages, and their general lithologic descriptions are given in table 1. Coastal plain formational units are bounded by unconformities; formations generally start with a relatively coarse basal lag bed and fine upward. Members within formations, where present, generally represent distinctive lithologic facies that occur within that formation. Surficial stratigraphic units, bounding scarps, and overlying terrace surface names are summarized in table 2. Unit names mostly conform to those used in this region by Mixon and others (1989) and Ward and Powars (1989) with the following exceptions.

Older coastal plain units, mostly encountered in the subsurface or along valley walls of deeply incised streams, include the nonmarine Patuxent Formation (Lower Cretaceous), the nonmarine Patapsco Formation (Lower Cretaceous), the marginal marine to shallow marine Clubhouse Formation (Upper Cretaceous), the nonmarine Cape Fear Formation (Upper Cretaceous), the marine Aquia Formation (upper Paleocene), the marine St. Marys Formation (upper Miocene), the marine Eastover Formation (upper Miocene), the marine Sunken Meadow Member of the Yorktown Formation (lower Pliocene; zone 1 of Mansfield, 1944), and the marine Rushmere and Morgarts Members of the Yorktown Formation (upper Pliocene; zone 2 of Mansfield, 1944). The updip limits of these units in the subsurface are shown in figure 3. The identity of the Patapsco Formation was verified by palynomorphs (Norman Frederiksen, written commun., 1994), and the identity of the Clubhouse Formation was verified by dinoflagellates (Lucy Edwards, written commun., 1994). The identity of the marine units was verified on site where possible by mollusks.

Surficial units include very high level fluvial gravels and sands that occur at elevations above 300 ft. These represent the Bon Air gravels of Johnson and others (1987a,b), which are equivalent in age to the Bryn Mawr Formation in Pennsylvania and Maryland (Lewis, 1881) and the Altamaha Formation in Georgia (Dall and Harris, 1892; Huddlestun, 1988) and South Carolina (Fallaw and Price, 1992). Recent mapping to the north of this area (Weems and Edwards, 2007) indicates that this unit is late middle Miocene in age and probably represents prograding onshore strata that locally overlie (but regionally are laterally equivalent to) the upper Choptank Formation.

East of the Altamaha outcrop belt, two lithologically distinct sand units overlie the upper Pliocene clay-silt Morgarts Beach Member of the Yorktown Formation. The older unit underlies the Richmond plain (Johnson and others, 1987a,b), but no name has been applied to the plain that caps the younger unit. Therefore, the name “Ashland plain” is used here because it is well developed in the vicinity of Ashland, Va. The lithologic characteristics of the older unit (a well-sorted, heavy-mineral-rich sand that underlies the plain at elevations of 240 to 270 ft) matches the lithology and stratigraphic position of occasionally fossiliferous marine deposits ascribed to the Duplin Marl just east of the Orangeburg scarp in South Carolina (Dall, 1898). This marine to marginal marine unit locally overlies the Morgarts Beach Member of the Yorktown Formation, and thus could represent either a regressive sandy phase of the Rushmere-Morgarts Beach transgressive event, or else may be the shoreline deposits of the succeeding Moore House Member of the Yorktown. So far, the proper name for this unit remains enigmatic so it is here simply designated “Yorktown Formation (zone 3),” adding an additional zone to the two-fold zonation of the Yorktown established by Mansfield (1944). The second unit (a marginal marine, poorly sorted, clayey sand at elevations of 195 to 230 ft) appears to be a northern extension of the Coharie Formation of North Carolina. In the southeastern part of the Emporia 1:100:000-scale quadrangle, a deep estuary fill underlies this terrace and links it southeastward with sediments of the Chowan

River Formation in the Chowan River area. Therefore, this terrace unit is composed of coastal strata of the lower Pleistocene (Gelasian) Chowan River Formation (Gibbard and others, 2010).

Terrace deposits between the elevations of 105 and 185 ft previously have been lumped together as the Bacons Castle Formation. There are, however, two distinct units represented within this complex, separated by a scarp at 137 to 147 ft. This scarp has been called the Parler scarp in South Carolina (Colquhoun, 1965) and the Mechanicsville scarp in northern South Carolina and southern North Carolina (DuBar and others, 1974). The name "Parler scarp" is used here. The older terrace deposit above the Parler scarp, here termed "lower Bacons Castle Formation," roughly is equivalent to a unit called the Varina Grove Member of the Bacons Castle Formation by Johnson and others (1987a,b). The younger part of the Bacons Castle, here termed "upper Bacons Castle Formation," includes what has been called the Bahramsville Member and Moorings unit of the Bacons Castle Formation (Johnson and others, 1987a,b). The Bacons Castle in its type area represents only the upper Bacons Castle Formation. The geomorphic terrace that the lower Bacons Castle Formation underlies has not been separately named, so the name "Essex plain" is used here because it is well developed in Essex County, Va. With these exceptions, existing nomenclatural usage is followed here. Strata equivalent to the upper Bacons Castle unit in southern North Carolina include lower Pleistocene (Calabrian) marine beds (Newton and others, 1978; Graybill and others, 2009), and these have recently been shown to be age equivalent to the type section of the Waccamaw Formation (Badyrka and others, 2010; Appleby and others, 2010). Thus the upper Bacons Castle unit is correlative with the type Waccamaw Formation in South Carolina.

Structural Geology

Seven faults have been recognized in the Emporia map area (fig. 2). These are here designated the Thornburg fault (demarcated by the Thornburg scarp), Spring Meadow fault (documented by Berquist and Bailey, 1999), Fountains Creek fault (found by Jerre Johnson, The College of William and Mary, retired), Dutch Gap fault (documented by Dischinger, 1987), Stony Creek fault, and City Point fault (implicit in the mapping of Dischinger, 1987). The Palmyra fault was traced into the map area from the south (Weems and Lewis, 2007). The Stony Creek fault prominently offsets Early Cretaceous strata of the Patuxent Formation (fig. 3) but does not show any obvious effect on younger strata. The other six faults show obvious to subtle effects on younger strata at least as young as late Pliocene (zones 2 and 3 of the Yorktown Formation). This can be seen most readily on the structure contour plot shown in figure 4. The Spring Meadow fault (in detail a fault zone) includes en echelon northwest-striking, high-angle, southwest-side-up reverse faults that experienced oblique dip-slip movement with a maximum demonstrable displacement of 6 meters on individual fault traces. The north-northeast-trending Dutch Gap fault, which trends north-south farther north, is an east-side-up reverse fault, and the Fountains Creek fault is a north-northeast-trending, high-angle, west-side-up reverse fault. The sense of motion on the other three faults has not been determined.

Hydrogeology

In the coastal plain part of the map, the surficial aquifer lies unconformably above the top of the Morgarts Beach Member of the Yorktown Formation (zone 2) in most areas. In some areas where the larger streams have cut down through the Yorktown, the Eastover, Patuxent, or crystalline basement may locally define the base of this water body (Trapp, 1992). The surficial aquifer is composed of clean, sandy to gravelly sediments that lie at the base of fining-upward

depositional packages that form the widespread upper Pliocene and Pleistocene terrace stratigraphic units of the region. The surficial aquifer is the main recharge unit for streams and rivers in the eastern three-fifths of the map area and is particularly vulnerable to surface pollutants. Deeper wells generally tap aquifer horizons in the Patuxent Formation or (in the extreme northeastern part of the map area) the Patapsco Formation. To the west of the coastal plain, groundwater mostly flows along joints and faults.

Acknowledgments

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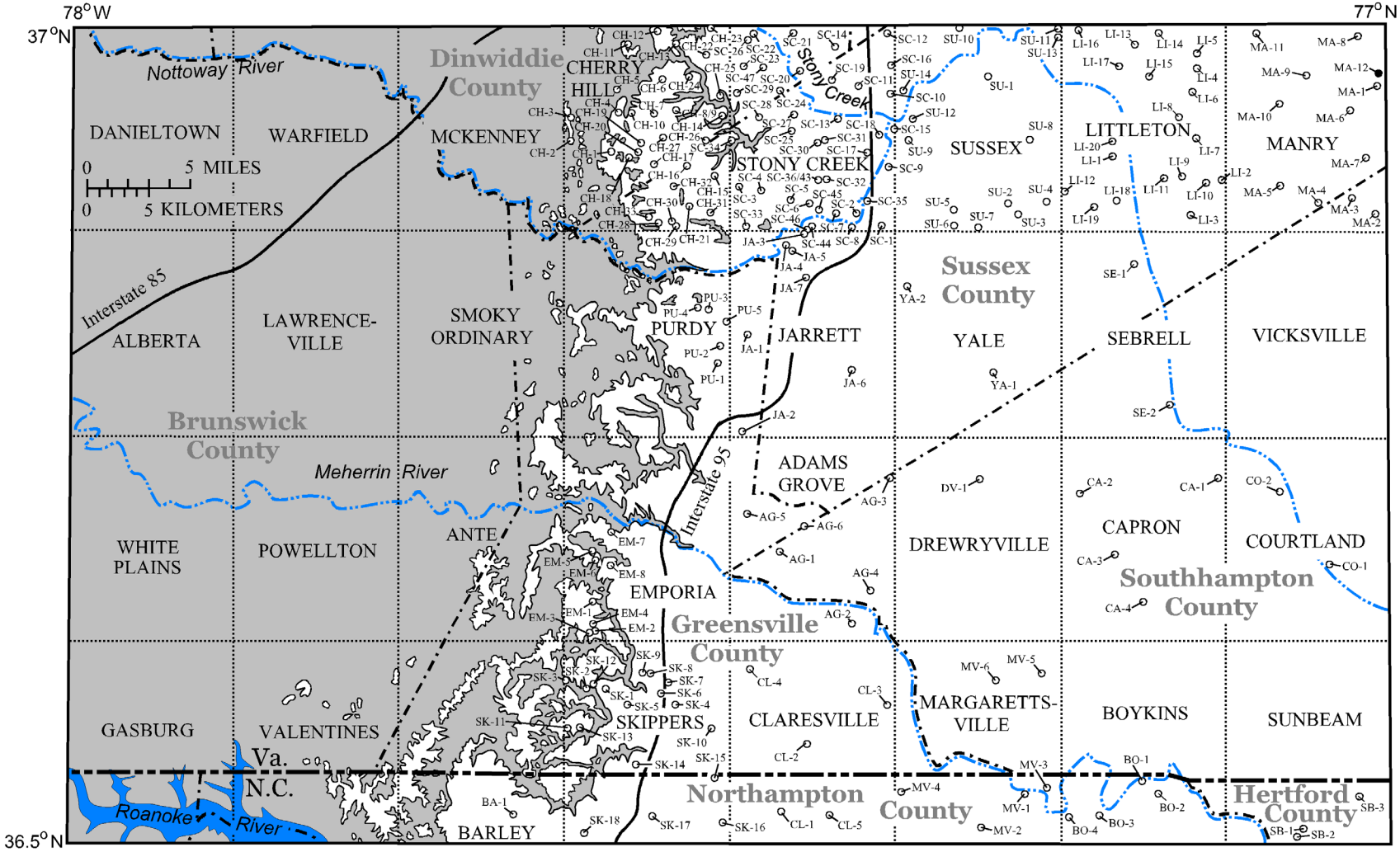

Figure 1. Map of the Emporia 1:100,000-scale quadrangle, showing area underlain by Atlantic Coastal Plain sediments (white), names and locations of constituent 1:24,000-scale quadrangles, and county names and boundaries. White circles indicate auger hole locations; black circle indicates corehole location. Gray area to west is the Roanoke Rapids terrane of the Piedmont province.

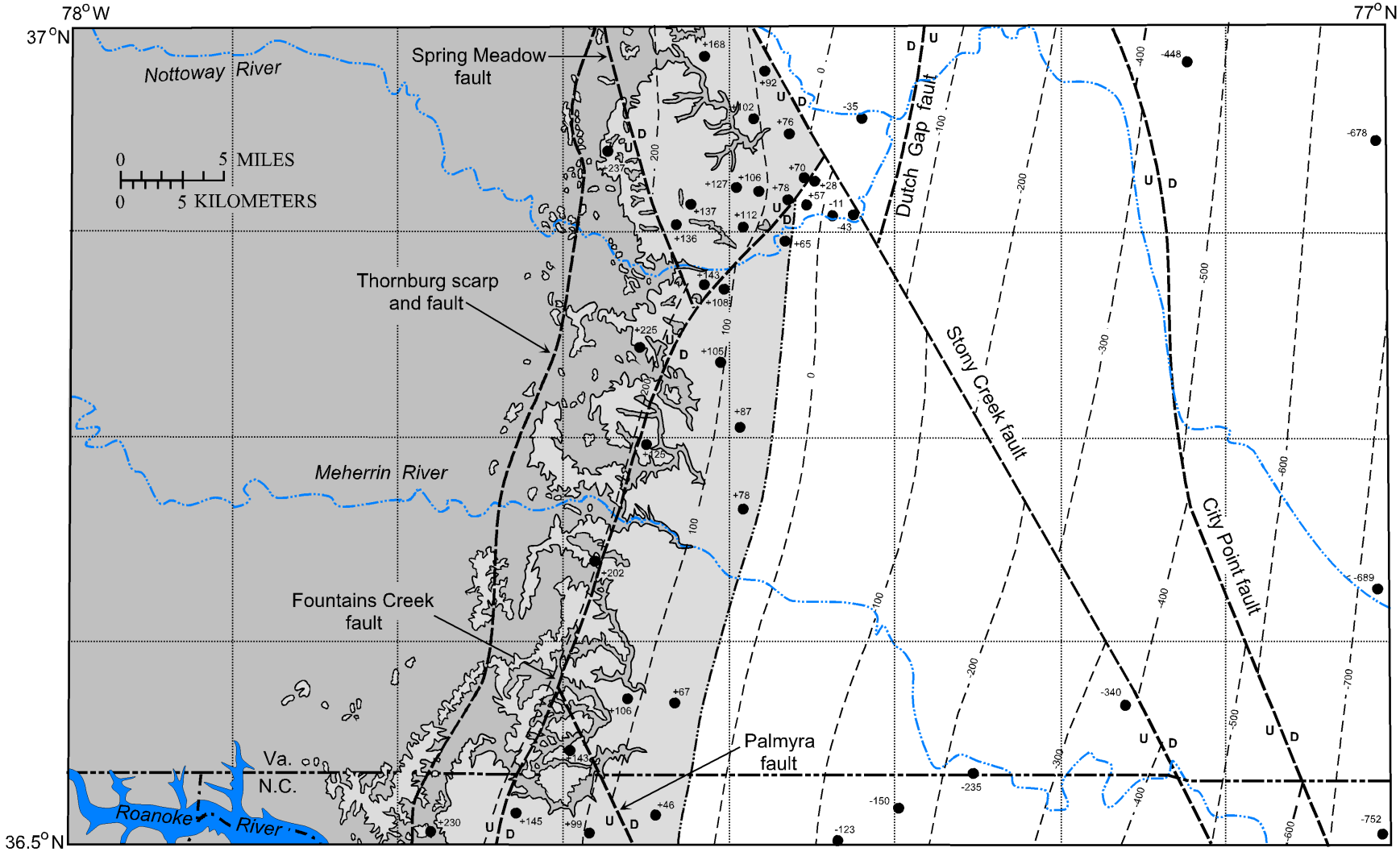

Figure 2. Structure contour map of the base of the coastal plain in the Emporia 1:100,000-scale quadrangle, showing areas where basement is overlain by Cretaceous sediments (white) and middle Miocene or younger sediments (light gray). Piedmont region is dark gray; contour interval is 100 feet. Faults indicated by heavy dashed lines with U for upthrown side and D for downthrown side. Black circles are basement control points. Negative values indicate below sea level.

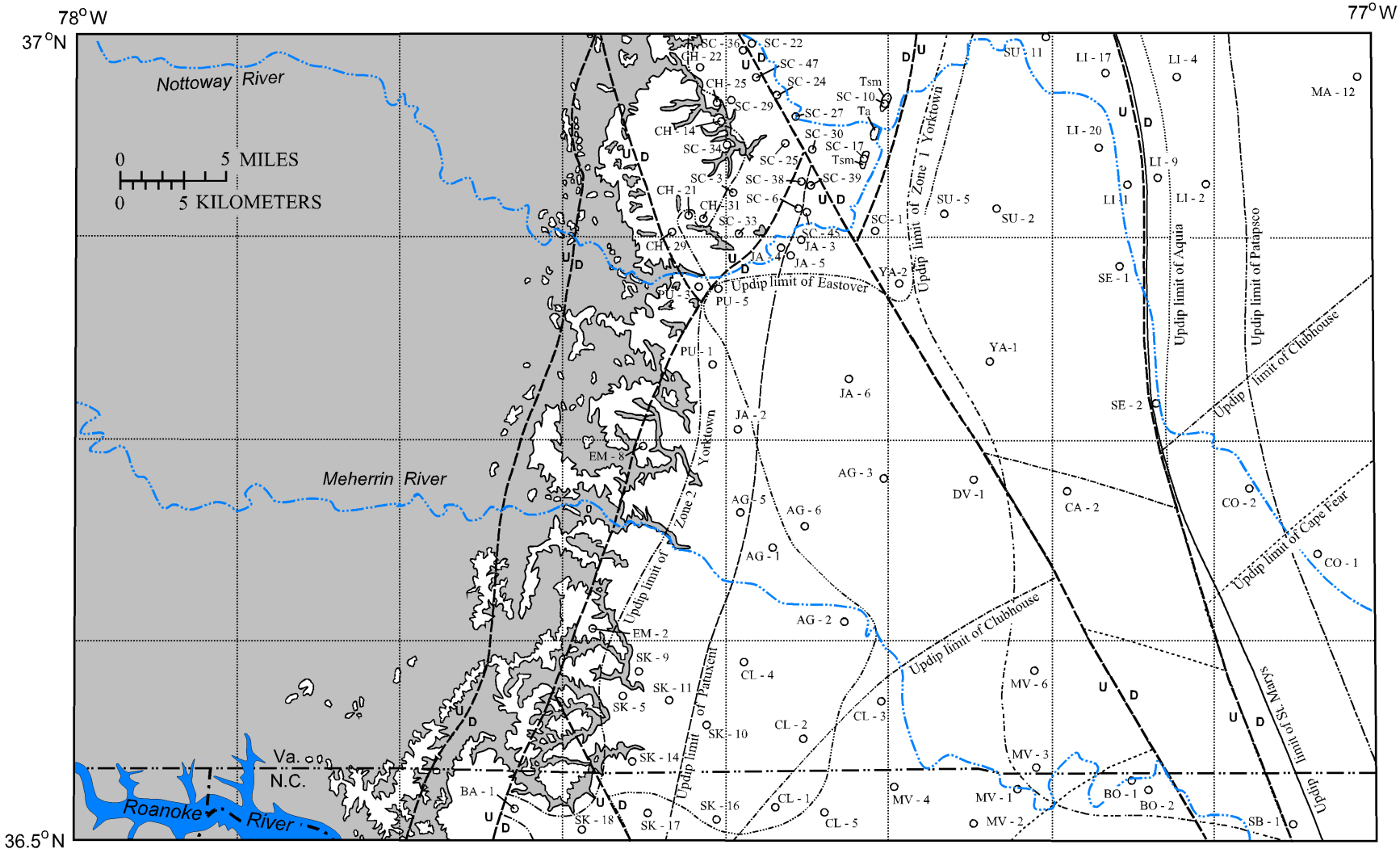

Figure 3. Faults and subsurface updip limits of Yorktown Formation and older units. Two outliers of St. Marys Formation (Tsm) and one outlier of Aquia Formation (Ta) are labeled. Circles and labels denote localities of subsurface control points described in auger logs and supplementary data sections.

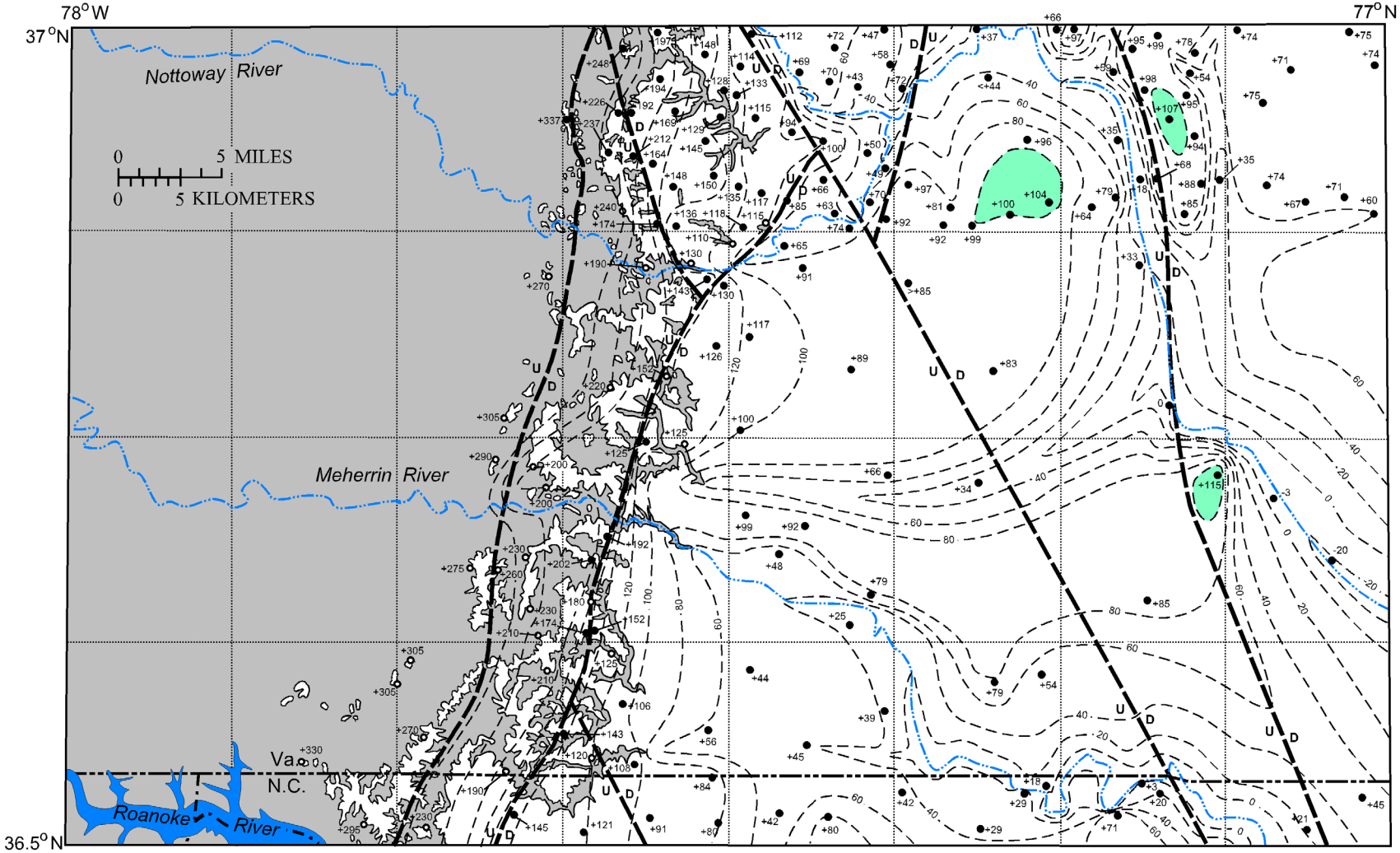

Figure 4. Structure contour map of the base of the surficial aquifer in the Emporia 1:100,000-scale quadrangle. Subsurface control points are shown as black circles with elevations (in feet) indicated next to them; outcrop data point are shown as white circles. In most of the region, the shallow aquifer immediately overlies zone 2 of the Yorktown Formation. Piedmont region is dark gray; high areas on top of Yorktown Formation are green; contour interval is 20 feet. Faults indicated by heavy dashed lines with U for upthrown side and D for downthrown side.

Table 1. Age and relative position of stratigraphic units penetrated during augering.

Unit	Lithology	Age
Artificial fill	Materials variable	Holocene
Dune sand	Fine to medium quartz sand	Holocene
Alluvium	Fine to coarse quartz sand, silty or clayey, pebbly	Holocene and Pleistocene(?)
Tabb Formation[1]	Fine to coarse quartz sand, poorly sorted, clayey	Pleistocene
Shirley Formation	Fine to coarse quartz sand, poorly sorted, clayey	Pleistocene
Chuckatuck Formation	Fine to coarse quartz sand, poorly sorted, clayey	Pleistocene
Charles City Formation	Fine to coarse quartz sand, poorly sorted, clayey	Pleistocene
Windsor Formation	Fine to coarse quartz sand, poorly sorted, locally gravelly	Pleistocene
Upper Bacons Castle Fm. (Moorings unit)	Fine to medium quartz sand, well-sorted	Pleistocene
Upper Bacons Castle Fm. (Bahramsville Member)	Fine to coarse quartz sand, poorly sorted, muddy, gravelly	Pleistocene
Lower Bacons Castle Fm. (Varina Grove Member)	Fine to coarse quartz sand, poorly sorted, muddy, gravelly	Pleistocene
Chowan River Formation	Fine to coarse quartz sand, poorly sorted, clayey, silty	Pleistocene
Yorktown Formation:		
Moore House Member(?) (zone 3)	Fine to coarse quartz sand; heavy minerals often abundant	Pliocene
Morgarts Beach Member (zone 2)	Silt to very fine quartz sand, silty and clayey, fossiliferous	Pliocene
Rushmere Member (zone 2)	Medium to very coarse sand; sparsely to abundantly shelly; locally pebble to cobble gravel	Pliocene
Sunken Meadow Member (zone 1)	Fine to medium quartz sand, silty, shelly, phosphatic; calcite-cemented lumps often abundant	Pliocene
Eastover Formation	Fine to medium quartz sand, well-sorted, glauconitic, shelly	Upper Miocene
St. Marys Formation:		
Unnamed member	Clayey silt to silt, dense, sticky	Upper Miocene
Windmill Point Member	Clayey silt to silt, dense, sticky	Upper Miocene
Altamaha Formation	Fine to coarse clayey quartz sand, poorly sorted, gravelly; most clasts soft and rotten	Middle Miocene

Unit	Lithology	Age
Aquia Formation	Fine to medium silty sand, glauconitic; contains scattered rounded quartz granules	Upper Paleocene
Cape Fear Formation	Medium to coarse sand, pebbly, garnetiferous, dense, varicolored	Upper Cretaceous
Clubhouse Formation	Silt, clayey, sandy (very fine), dense, varicolored, interbedded with fine to medium quartz sand and dense varicolored clays	Upper Cretaceous
Patapsco Formation	Fine to very coarse feldspathic quartz sand interbedded with gravel and dense varicolored clays	Lower Cretaceous
Patuxent Formation[1]	Fine to very coarse feldspathic quartz sand, pebbly, garnetiferous; rare clay lenses	Lower Cretaceous
Petersburg Granite	Medium-grained granite, weathering to angular quartz-rich saprolite	Upper Carboniferous
Rocks of the eastern Carolina slate belt:		
Aluminous Carolina slate belt rocks	Fine to medium schists and gneisses, sometimes carbonaceous, weathering to quartz and (or) staurolite-rich banded clays	Upper Paleozoic
Metamorphosed granite	Medium-grained granite, strongly foliated, weathering to subangular to subrounded quartz-rich saprolite	Cambrian(?)
Felsic Carolina slate belt rocks	Fine to medium feldspar-rich schists and gneisses, weathering to banded clays	Cambrian and (or) Neoproterozoic

[1]Within map area, but not augered.

Table 2. Nomenclature and maximum elevation for terrace units in map area.

Unit	Overlying surface	Maximum elevation	Intervening scarp
Altamaha Formation	Midlothian uplands	410 feet	
			Thornburg scarp
Yorktown Formation (zone 3)	Richmond plain	275 feet	
			Chippenham scarp
Chowan River Formation	Ashland plain	235 feet	
			Broad Rock scarp
Lower Bacons Castle Formation	Essex plain	182 feet	
			Parler scarp
Upper Bacons Castle Formation	Norge uplands	137 feet	
			Surry scarp
Windsor Formation	Lackey plain	105 feet	
			Ruthville scarp
Charles City Formation	Grove plain	80 feet	
			Lee Hall scarp
Chuckatuck Formation	Grafton plain	62 feet	
			Kings Mill scarp
Shirley Formation	Huntington flat	49 feet	
			Suffolk scarp
Tabb Formation	Todds flat	26 feet	

Locality Descriptions and Detailed Lithologic Logs

Adams Grove Quadrangle

AG–1: 4.9 miles west of eastern quadrangle border, 3.76 miles north of southern quadrangle border, in west-central 1/9th of map area (latitude 36.6808° N., longitude 77.4632° W.). Surface elevation 71 feet.

LITHOLOGY	DEPTH IN FEET
Artificial fill, sandy clay, orange (5*YR* 6/7)	0–1
Alluvium	
Clay, silty, sandy (very fine), plastic, dense, slightly micaceous, yellowish brown (10*YR* 5/2) with moderate yellowish brown (10*YR* 5/4) mottles, grading down to brownish gray (5*YR* 4/1)	1–6
Clay, silty, sandy (very fine), grading down to very fine, clayey, silty sand; medium gray (*N* 5)	6–9
Sand, fine to medium, grading down to medium to coarse, micaceous sand; contains occasional rounded to subrounded quartz pebbles up to 1 cm in diameter; sand fraction includes garnet, kyanite, and dark heavy minerals; medium gray (*N* 5)	9–21
Gravel containing rounded to subrounded quartz pebbles up to 5 cm in diameter; coarse to very coarse sand matrix; medium gray *(N* 5)	21–23
Patuxent Formation	
Sand, medium to very coarse, dense; garnets abundant; contains rounded quartz pebbles up to 3 cm in diameter, grading down to fine to medium sand with polished egg-shaped quartz pebbles up to 2 cm in diameter; light gray (*N* 7)	23–31

Base of alluvium: **+48 feet elevation**

Bottomed in Patuxent Formation

AG–2: 1.87 miles west of eastern quadrangle border, 0.70 mile north of southern quadrangle border, in southeastern 1/9th of map area (latitude 36.6808° N., longitude 77.4090° W.). Surface elevation about 59 feet.

LITHOLOGY	DEPTH IN FEET
Chuckatuck Formation	
Sand, very fine to fine, silty, brown (5*YR* 5/5)	0–2
Sand, very fine to fine, silty, micaceous, brown (5*YR* 5/5) with dark yellowish orange (10*YR* 6/6) and very pale orange (10*YR* 8/6) mottles, grading back to brown (5*YR* 5/5) at 6 feet; lower contact gradational	2–10
Sand, fine to medium, orange (5*YR* 5/7); lower contact gradational	10–13
Sand, medium to very coarse; contains rounded quartz pebbles up to 3 cm in diameter; very pale orange (10*YR* 8/2) (10–15 feet) grading down to orange (5*YR* 5/7)	13–30
Sand, medium to very coarse; contains rounded quartz pebbles up to 3 cm in diameter; coarsely micaceous, greenish gray (5*G* 6/1)	30–34
Patuxent Formation	
Sand, medium to coarse, kaolinitic; contains rare, moderately polished, subrounded quartz pebbles up to 1 cm in diameter; light bluish gray (5*B* 8/1); stiff drilling	34–41

Base of Chuckatuck Formation: **+25 feet elevation**

Bottomed in Patuxent Formation

AG–3: 0.16 mile west of eastern quadrangle border, 6.85 miles north of southern quadrangle border, in northeastern 1/9th of map area (latitude 36.7247° N., longitude 77.3775° W.). Surface elevation about 77 feet.

LITHOLOGY	DEPTH IN FEET
Artificial fill, sand with mixed colors	0–3
Alluvium	
Sand, fine, well-sorted, silty, humic A-horizon, brownish gray (5*YR* 4/1)	3–4
Sand, fine, well-sorted, silty, clayey in basal foot, light brownish gray (5*YR* 6/1); lower contact somewhat gradational	4–8
Sand, medium to coarse, grading to coarse to very coarse and granular, clean sand; light brownish gray (5*YR* 6/1)	8–11
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), finely micaceous, shelly (*Turritella*) at 13 feet, bluish greenish gray (5*BG* 5/1)	11–25
Yorktown Formation (zone 1)	
Sand, fine; includes phosphate sand fraction; shelly (including *Chesapecten*, oysters, and other fossils); some shells encrusted by nodules; greenish gray (5*G* 6/1)	25–29
Eastover Formation	
Sand, fine, well-sorted, very sparsely shelly, olive gray (5*Y* 5/1) (29–32 feet) grading down to dark greenish gray (5*G* 4/1); lower contact gradational	29–47
Sand, medium to coarse; contains quartz pebbles up to 2 cm in diameter; dark greenish gray (5*G* 4/1)	47–49
Patuxent Formation	
Sand, coarse to very coarse; contains subrounded quartz pebbles up to 2 cm in diameter; very light bluish gray (5*B* 8/1)	49–56

Base of alluvium:	**+66 feet elevation**
Base of Yorktown Formation (zone 2):	**+52 feet elevation**
Base of Yorktown Formation (zone 1):	**+48 feet elevation**
Base of Eastover Formation:	**+28 feet elevation**

Bottomed in Patuxent Formation

AG–4: 1.00 mile west of eastern quadrangle border, 2.05 miles north of southern quadrangle border, in southeastern 1/9th of map area (latitude 36.6549° N., longitude 77.3926° W.). Surface elevation about 120 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, fine to medium, silty, clayey, pale yellowish orange (10*YR* 8/4) grading down to dark yellowish orange (10*YR* 6/6)	0–1
Sand, very fine, clayey, silty, dense and stiff, grading down to clayey, sandy (very fine) silt; dark yellowish orange (10*YR* 6/6), with red (5*R* 5/6), very light gray (*N* 8), and orange (5*YR* 6/7) mottles, grading down to very light gray (*N* 8)	1–7
Silt, sandy (very fine), ranging to very fine, silty, finely micaceous sand; orange (5*YR* 6/7) grading down to dark yellowish orange (10*YR* 6/6) with streaks of very light gray (*N* 8)	7–15
Sand, coarse to very coarse, granular, angular, silty, dark yellowish orange (10*YR* 6/6)	15–17
Chowan River Formation	
Silt, clayey, finely micaceous, very light gray (*N* 8) mixed with reddish orange (5*YR* 5/6) grading through pinkish gray (5*YR* 9/1) (21–29 feet) to bluish gray (5*B* 5/1)	17–30
Silt, sandy (very fine), finely micaceous, yellowish gray (10*YR* 9/1); lower contact gradational	30–32
Sand, fine to coarse, angular, silty, yellowish gray (10*YR* 9/1); lower contact gradational	32–39
Sand, coarse to very coarse, angular; contains angular to subangular quartz pebbles up to 2 cm in diameter; yellowish gray (10*YR* 9/1); lower contact abrupt	39–41
Yorktown Formation (zone 2)	
Silt, sandy (very fine), finely micaceous, orange (5*YR* 6/6) (41–43 feet) grading down to bluish gray (5*B* 4/1)	41–51

Base of upper Bacons Castle Formation: **+103 feet elevation**
Base of Chowan River Formation: **+79 feet elevation**

Bottomed in Yorktown Formation (zone 2)

AG–5: 6.25 miles west of eastern quadrangle border, 5.30 miles north of southern quadrangle border, in west-central 1/9th of map area (latitude 36.7027° N., longitude 77.4878° W.). Surface elevation about 150 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine with scattered medium to coarse grains; very fine dark heavy minerals present; pale grayish orange (10*YR* 8/3)	0–1
Sand, dominantly fine, poorly sorted, silty, orange (5*YR* 6/6) with blotches of dark yellowish orange (10*YR* 6/6) and dark red (5*R* 3/6); lower contact gradational	1–4
Sand, mostly fine with some medium to coarse grains, subangular, poorly sorted, clayey, grayish orange (10*YR* 7/4) with blotches of pale orange (10*YR* 7/2)	4–6
Sand, fine, grading down to dominantly medium to coarse, subangular, clayey sand; very pale orange (10*YR* 8/2) with blotches of dark red (5*R* 3/6)	6–11
Sand, coarse to very coarse, poorly sorted, granular, subangular to subrounded, very pale orange (10*YR* 8/2) with blotches of dark red (5*R* 3/6)	11–12
Sand, fine to coarse, poorly sorted, angular to subangular, silty, clayey, micaceous, brown (5*YR* 5/6) with sparse blotches of light gray (*N* 7)	12–16
Sand, medium to coarse, grading down to coarse to very coarse, granular, subangular to subrounded sand; dense clay bed present from 21 to 21.5 feet; light gray (*N* 7) with blotches of grayish orange pink (5*YR* 7/2) and dark red (5*R* 3/6)	16–22
Chowan River Formation	
Sand, fine to medium, grading down to medium and then back to fine to medium; subrounded to rounded and well sorted throughout; contains scattered grains of very fine dark heavy minerals; sparsely micaceous; clay balls or disrupted clay lenses present below 23 feet; thixotropic, orange pink (10*R* 7/3); lower contact somewhat gradational	22–31
Sand, fine, silty with clay lenses; very fine dark heavy minerals scattered throughout sand fraction; bluish gray (5*B* 5/1)	31–43

Sand, dominantly fine but with scattered medium to coarse grains; very fine dark heavy minerals present; grayish orange pink (5*YR* 7/2) and grayish orange (10*YR* 7/4) with minor orange (5*YR* 6/7) intervals 43–47

Sand, medium, grading down to coarse to very coarse sand; contains scattered subangular quartz granules and pebbles up to 1 cm in diameter; very pale orange (10*YR* 8/2) 47–51

Yorktown Formation (zone 2)

Silt, sandy (very fine), clayey, finely micaceous, denser than beds above; clams (*Mulinia*) abundant between 65 and 68 feet; top 6 inches dark yellowish orange (10*YR* 6/6) and below that, medium bluish gray (5*B* 5/1) 51–68

Sand, fine to medium, phosphatic; contains diverse shell fauna (*Chesapecten*, *Mercenaria*, and other fossils); light bluish gray (5*B* 6/1) 68–72

Granite

Saprolite from granite, coarse; polygonal clear quartz grains in clay matrix; light greenish gray (5*G* 8/1)..... 72–76

Base of lower Bacons Castle Formation: +128 feet elevation
Base of Chowan River Formation: +99 feet elevation
Base of Yorktown Formation (zone 2): +78 feet elevation

Bottomed in saprolite from granite

AG–6: 3.83 miles west of eastern quadrangle border, 4.78 miles north of southern quadrangle border, in central 1/9th of map area (latitude 36.6951° N., longitude 77.4439° W.). Surface elevation about 130 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, fine, clean, dark yellowish orange (10*YR* 6/6)	0–1
Sand, mostly fine but with scattered medium to coarse grains, subrounded, slightly silty and clayey, pale grayish orange (10*YR* 8/3)	1–6
Sand, medium to coarse, subrounded to subangular, clean, pale grayish orange (10*YR* 8/3)	6–8
Chowan River Formation	
Silt, very clayey, yellowish orange (10*YR* 7/7); lower contact somewhat gradational	8–14
Silt, clayey, sandy (very fine), finely micaceous, soft, grayish red (10*R* 4/2)	14–30
Sand, fine to medium; very fine dark heavy minerals abundant; grayish red (10*R* 4/2)	30–31
Silt, clayey, sandy (very fine), finely micaceous, soft, grayish red (10*R* 4/2)	31–33
Sand, fine to medium; very fine dark heavy minerals abundant; grayish red (10*R* 4/2)	33–34
Silt, clayey, sandy (very fine), finely micaceous, soft, grayish red (10*R* 4/2)	34–37
Sand, fine to medium; contains scattered subangular to subrounded quartz granules; grayish red (10*R* 4/2)	37–38
Yorktown Formation (zone 2)	
Silt, clayey, dense, light gray (*N* 7) (38–41 feet) grading down to medium bluish gray (5*B* 5/1); lower contact gradational	38–58
Sand, fine, grading down to medium, finely micaceous sand; medium bluish greenish gray (5*BG* 5/1)	58–61

Gravel containing clasts 1 to 2 cm in diameter of indurated Eastover(?) matrix and quartz pebbles; medium bluish greenish gray (5*BG* 5/1) 61–62

Eastover Formation

Sand, fine, well-sorted; contains sparse rotten shell material; greenish gray (5*G* 4/1) 62–66

Base of upper Bacons Castle Formation: +122 feet elevation
Base of Chowan River Formation: +92 feet elevation
Base of Yorktown Formation (zone 2): +68 feet elevation

Bottomed in Eastover Formation

Barley Quadrangle

BA–1: At intersection of dirt roads, 1.3 miles northeast of Gum Forks and 0.1 mile west of power line, in southeastern 1/9th of map area (latitude 36.5183° N., longitude 77.6618° W.). Surface elevation 200 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, fine to very coarse, poorly sorted, subangular, granular, silty, slightly clayey, reddish brown (10*R* 4/7) (0–6 feet) grading down to grayish orange (10*YR* 7/4)	0–12
Gravel containing rounded quartz pebbles up to 1 cm in diameter in matrix of dark yellowish orange, silty, fine to very coarse sand	12–13
Sand, fine to medium, moderately well sorted; very fine to fine dark heavy minerals abundant; light orange (5*YR* 7/6)	13–16
Sand, coarse to very coarse, rounded; contains rounded to discoidal pebbles up to 4 cm in diameter; clayey below 44 feet; clay balls present in basal 2 feet; grayish orange (10*YR* 7/4) (16–38 feet) grading down to very pale orange (10*YR* 8/2)	16–49
Yorktown Formation (zone 3)	
Sand, medium, grading down to medium to coarse, subrounded to rounded, well-sorted, clean sand; contains about 1 percent fine dark heavy minerals; thixotropic; basal foot contains rounded to discoidal, slightly polished quartz pebbles up to 4 cm in diameter; white (*N* 9)	49–55
Yorktown Formation (zone 2)	
Sand, fine, silty, clayey, coarsely micaceous; rounded quartz and rotten diorite pebbles up to 2 cm in diameter common, as well as a subangular metavolcanic pebble; moderate brown (5*YR* 4/4) grading rapidly down to dark bluish gray (5*B* 4/1)	55–56

Base of Chowan River Formation: **+151 feet elevation**
Base of Yorktown Formation (zone 3): **+145 feet elevation**

Bottomed in basal lag bed of Yorktown Formation (zone 2)

Boykins Quadrangle

BO–1: On short dirt road on eastern side of N.C. State Road 35, 300 feet south of the Meherrin River, in south-central 1/9th of map area (latitude 36.5380° N., longitude 77.1880° W.). Surface elevation 25 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, fine with scattered medium grains; sparse very fine dark heavy minerals present; soft; color ranges from dusky yellow (5*Y* 6/4) to yellowish gray (5*Y* 7/2)	0–14
Sand, fine, clayey, medium light gray (*N* 6)	14–14.5
Sand, very fine to fine; abundant very fine dark heavy minerals; thixotropic, medium bluish gray (5*B* 5/1)	14.5–18
Sand, very fine to very coarse, poorly sorted, clayey, woody, brownish black (5*YR* 2/1)	18–19
Sand, very fine to mostly coarse to very coarse, poorly sorted; contains subrounded quartz pebbles up to 0.5 cm in diameter; medium olive gray (5*Y* 5/1)	19–22
Eastover Formation	
Sand, very fine to fine, clayey and greenish gray (5*GY* 5/1) in top foot, grading down rapidly to silty and dark greenish gray (5*G* 4/1) sand	22–26
Sand, very fine to fine, silty, finely micaceous; contains very fine dark heavy minerals; sparse shell fragments; sparse rounded quartz pebbles up to 1 cm in diameter present at base; dark greenish gray (5*G* 4/1)	26–37
Cape Fear Formation	
Sand, fine to medium, grading down through medium to coarse and through fine to medium (47–49 feet) back to medium to coarse, micaceous with flakes up to 4 mm across; sparse dark heavy minerals present;contains sparse rounded quartz pebbles up to 1 cm in diameter, scattered very coarse blue quartz grains, and one clay ball, 2 cm in diameter; medium greenish gray (5*GY* 5/1)	37–51

Base of alluvium:	**+3 feet elevation**
Base of Eastover Formation:	**-12 feet elevation**

Bottomed in Cape Fear Formation

BO–2: On southern side of abandoned house, 300 feet southwest of power line, at end of short road off of N.C. State Road 35, 0.75 mile south of Meherrin River bridge, in south-central 1/9th of map area (latitude 36.5306° N., longitude 77.1761° W.). Surface elevation 58 feet.

LITHOLOGY	DEPTH IN FEET
Chuckatuck Formation	
Sand, very fine to fine, silty, slightly clayey, dark yellowish orange (10*YR* 6/6) grading down through dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) mottles (3–6 feet) to pale orange (10*YR* 7/2) sand; lower contact gradational	0–8
Sand, very fine to fine, grading down to fine to medium sand; very fine dark heavy minerals abundant; clean, thixotropic, finely micaceous, pale orange (10*YR* 7/2)	8–16
Yorktown Formation (zone 2)	
Silt, clayey, finely micaceous; shelly below 20 feet (*Mulinia* and *Turritella*); color of top 4 inches is an orange (5*YR* 5/7) weathering rind that overlies medium bluish gray (5*B* 5/1)	16–38
Yorktown Formation (zone 1)	
Sand, very fine, grading down to fine, silty, shelly sand; fine phosphate sand abundant; calcite-cemented lumps abundant below 42 feet; greenish gray (5*GY* 5/1)	38–47
Eastover Formation	
Sand, very fine, clayey and dense, finely micaceous; contains very sparse shells; greenish gray (5*G* 5/1); lower contact somewhat gradational	47–57
Sand, fine, silty, greenish gray (5*G* 5/1)	57–58

Base of Chuckatuck Formation: **+42 feet elevation**
Base of Yorktown Formation (zone 2): **+20 feet elevation**
Base of Yorktown Formation (zone 1): **+11 feet elevation**

Bottomed in Eastover Formation

BO–3: On southern side of N.C. State Road 1333 on 100-foot contour line, 1.65 miles east of western quadrangle border, in southwestern 1/9th of map area (latitude 36.5168° N., longitude 77.2202° W.). Surface elevation 100 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, very fine to fine, silty, slightly clayey; sparse very fine dark heavy mineral grains present; dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) mottles below 4 feet	0–10
Sand, fine to medium, silty, clayey; contains abundant subrounded quartz granules and pebbles up to 1 cm in diameter; dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) mottles	10–11
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, medium to coarse to medium to very coarse; contains subangular to subrounded quartz granules; quartz pebbles at base up to 2.5 cm in diameter; yellowish orange (10*YR* 7/6) grading down to orange (10*YR* 6/8)	11–20
Chowan River Formation	
Silt, very clayey, very light gray (*N* 8)	20–21
Sand, fine to medium, well-sorted, scattered very fine to fine dark heavy mineral grains and fine mica; thixotropic, dark yellowish orange (10*YR* 6/6) grading down to orange (5*YR* 5/8); basal contact abrupt but no coarse basal bed	21–29
Yorktown Formation (zone 2)	
Silt, sandy (very fine), finely micaceous, interbedded with laminae of very fine clean sand with very fine dark heavy minerals; medium bluish gray (5*B* 5/1)	29–44
Sand, very fine, silty, medium bluish gray (5*B* 5/1)	44–45
Silt, sandy (very fine), finely micaceous, interbedded with laminae of very fine clean sand with very fine dark heavy minerals; medium bluish gray (5*B* 5/1)	45–61

Sand, very fine to fine; base of bed contains subrounded lumps of calcite-cemented glauconitic sand up to 0.5 cm in diameter; medium bluish gray (5*B* 5/1) 45–61

Sand, fine, silty, shelly, medium greenish gray (5*G* 5/1) 61–66

Base of Windsor Formation: **+89 feet elevation**
Base of upper Bacons Castle Formation: **+80 feet elevation**
Base of Chowan River Formation: **+71 feet elevation**

Bottomed in Yorktown Formation (zone 2)

BO–4: In wooded area south of N.C. State Road 1333 and north of N.C. State Road 1444, 0.45 mile east of western quadrangle border and 1.15 miles north of southern quadrangle border, in southwestern 1/9th of map area (latitude 36.5167° N., longitude 77.2416° W.). Surface elevation 121 feet.

LITHOLOGY DEPTH IN FEET

Upper Bacons Castle Formation (Moorings unit)

Sand, fine, well-sorted; sparse very fine dark heavy mineral grains present; dark yellowish brown (10*Y* 4/2) grading down through pale yellowish orange (10*YR* 8/3) (1–2 feet) through dark yellowish orange (10*YR* 6/6) (2–3 feet) through pale yellowish orange (10*YR* 8/3) with black streaks of humate (3–4 feet) and through pale yellowish brown (10*YR* 6/2) (4–6 feet) to grayish brown (5*YR* 4/2) (6–8 feet) 0–8

Sand, very fine, silty; very fine dark heavy minerals abundant; thixotropic, very pale orange pink (5*YR* 8/2) grading down and through grayish orange (10*YR* 7/2) (32–34 feet) and through medium light gray (*N* 6) (34–39 feet) to pale yellowish orange (10*YR* 8/3) (39–40 feet)..... 8–40

Silt, very clayey, lignitic, medium light gray (*N* 6) 40–40.5

Sand, medium, grading down to coarse to very coarse sand; pale yellowish orange (10*YR* 8/3)..... 40.5–42

Upper Bacons Castle Formation (Bahramsville Member)

Sand, coarse to very coarse, subangular, orange (5*YR* 6/7), except for 2-inch-thick layer of bluish gray (5*B* 5/1), clayey and silty, coarse to very coarse sand..... 42–46

Base of upper Bacons Castle Formation (Moorings unit): +79 feet elevation

Bottomed in upper Bacons Castle Formation (Bahramsville Member)

Capron Quadrangle

CA–1: In wooded area on northern side of dirt road, 0.25 mile east of 114-foot spot elevation on Va. State Road 757, 0.33 mile west of eastern quadrangle border and 1.65 miles south of northern quadrangle border, in northeastern 1/9th of map area (latitude 36.7259° N., longitude 77.1307° W.). Surface elevation 131 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Moorings unit)	
Sand, fine, well-sorted; abundant very fine dark heavy mineral grains present; very pale orange (10*YR* 8/2) grading down to dark yellowish orange (10*YR* 6/6) in top foot then; dark yellowish orange (10*YR* 6/6) (1–5 feet) grading down through very pale orange (10*YR* 8/2) (5–6 feet) and pale yellowish brown (10*YR* 7/2) (6–15 feet) to dark yellowish orange (10*YR* 6/6) again in basal foot	0–16
Upper Bacons Castle Formation (Bahramsville Member)	
Silt, clayey, finely micaceous; lenses of very fine sandy silt present; very light gray (*N* 8) grading down to brown (5*YR* 6/6)	16–22
Silt, clayey, finely micaceous, bluish gray (5*B* 5/1)	22–26
Silt, clayey, finely micaceous, interbedded with very fine sandy silt and very fine silty sand; greenish gray (5*G* 5/1)	26–41
Silt, clayey, finely micaceous, much denser than unit above; burrows filled with fine sand present in upper 3 feet; dark bluish gray (5*B* 4/1)	41–49
Yorktown Formation (zone 2)	
Sand, fine, clayey, silty; clayey fraction has sparse lignite and coarse mica flakes; dark greenish gray (5*GY* 4/1) interbedded with light gray (*N* 7) clean sand	49–51
Silt, sandy (very fine), finely micaceous, medium bluish gray (5*B* 5/1), much denser than above; small shells (*Mulinia*) present below 59 feet	51–61

Base of upper Bacons Castle Formation (Moorings unit): +115 feet elevation
Base of upper Bacons Castle Formation (Bahramsville Member): +82 feet elevation

Bottomed in Yorktown Formation (zone 2)

CA–2: 0.1 mile south of Angelico on western side of Va. State Road 657 and northern side of unnamed creek branch, in northwestern 1/9th of map area (latitude 36.7163° N., longitude 77.2362° W.). Surface elevation 50 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, fine, clean, mostly well-sorted but with scattered medium and coarse grains, dark yellowish orange (10*YR* 6/6) (0–1 foot) grading down to yellowish gray (5*Y* 8/1)	0–6
Sand, medium to coarse, clean, light gray (*N* 9)	6–7
Chuckatuck Formation	
Sand, fine, grading down to medium to coarse sand; dark yellowish orange (10*YR* 6/6) grading down through pinkish gray (5*YR* 8/1) back to dark yellowish orange (10*YR* 6/6)	7–11
Silt, sandy (very fine), grading down to very fine, silty sand; brownish gray (5*YR* 4/1) grading down to olive gray (5*Y* 5/1)	11–12
Sand, medium to coarse, granular, olive gray (5*Y* 5/1)	12–13
Yorktown Formation (zone 2)	
Silt, sandy (very fine), clayey, finely micaceous; *Mulinia* present below 21 feet; greenish gray (5*GY* 5/1)	13–28
Sand, fine to medium, very shelly (*Mulinia*, *Chesapecten*, oyster, and other mollusks), greenish gray (5*G* 5/1)	28–31
Yorktown Formation (zone 1)	
Sand, fine; phosphate sand abundant; light greenish gray (5*GY* 7/1)	31–32
Indurated ledge; no recovery	32–34
Sand, fine; phosphate sand abundant; contains calcite-cemented lumps and shell fragments; light greenish gray (5*GY* 7/1)	34–36
Indurated ledge; no recovery	36–37

Sand, fine; phosphate sand abundant; contains calcite-cemented lumps and shell fragments; light greenish gray (5*GY* 7/1)..... 37–42

Eastover Formation

Sand, fine, well-sorted at top but grading downward to less well sorted, dark greenish gray (5*G* 4/1) 42–46

Sand, medium to very coarse, silty; phosphate and quartz granules and rounded pebbles up to 3 cm in diameter abundant; dark greenish gray (5*GY* 4/1) 46–51

Clubhouse Formation

Silt, very clayey, sandy (very fine), dense, interbedded with very fine, silty, finely micaceous sand; dominantly greenish gray (5*GY* 6/1) 51–56

Base of alluvium:	**+43 feet elevation**
Base of Chuckatuck Formation:	**+37 feet elevation**
Base of Yorktown Formation (zone 2):	**+19 feet elevation**
Base of Yorktown Formation (zone 1):	**+8 feet elevation**
Base of Eastover Formation:	**-1 foot elevation**

Bottomed in Clubhouse Formation

CA–3: On northern side of Va. State Road 658, 0.1 mile northeast of western intersection of Va. State Road 657 and Va. State Road 658, in west-central 1/9th of map area (latitude 36.6790° N., longitude 77.2081° W.). Surface elevation 128 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Moorings unit)	
Sand, fine, well-sorted, silty, slightly clayey, pale orange (10*YR* 8/3)	0–1
Sand, fine, well-sorted, silty, slightly clayey, pale orange (10*YR* 8/3), prominently mottled dark yellowish orange (10*YR* 6/6) and dark brownish gray (5*YR* 4/1) and sparsely mottled light brownish gray (5*YR* 6/1)	1–5
Sand, fine, well-sorted, silty, slightly clayey; very fine dark heavy minerals abundant; light brownish gray (5*YR* 6/1) grading down through dark yellowish orange (10*YR* 6/6) (8–9 feet) to very pale orange (10*YR* 9/1)	5–12
Silt, very clayey, very thin (less than 1 inch thick), grayish orange (10*YR* 7/4)	at 12
Sand, fine, well-sorted, silty, slightly clayey; very fine dark heavy minerals abundant; grayish orange (10*YR* 7/4)	12–15
Upper Bacons Castle Formation (Barhamsville Member)	
Silt, clayey, sandy (very fine), interbedded with lenses of very fine sand; grayish orange (10*YR* 7/4)	15–16

Base of upper Bacons Castle Formation (Moorings unit): +113 feet elevation

Bottomed in upper Bacons Castle Formation (Barhamsville Member)

CA–4: On western side of Va. State Road 693, 100 feet north of 122-foot spot elevation, in south-central 1/9th of map area (latitude 36.6491° N., longitude 77.1841° W.). Surface elevation 122 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Moorings unit)	
Sand, fine, well-sorted, clean; very fine dark heavy minerals abundant; humic near base; pale orange (10*YR* 8/3) grading down through dark yellowish orange (10*YR* 6/6) (3–9 feet), very pale orange (10*YR* 9/1) (9–10 feet), orange (5*YR* 6/7) (10–14 feet), moderate brown (5*YR* 4/4) (14–15 feet), and dusky brown (5*YR* 2/2) (15–16 feet) to reddish brown (10*R* 4/6) and reddish orange (10*R* 6/6)	0–18
Upper Bacons Castle Formation (Barhamsville Member)	
Silt, clayey, interbedded with thin lenses of very fine sand; reddish orange (10*R* 6/6) grading down to grayish orange (10*YR* 7/4), lower contact somewhat gradational	18–26
Silt, clayey, finely micaceous, sandy (very fine), medium bluish gray (5*B* 5/1)	26–29
Silt, very clayey, interbedded with very fine sand; greenish gray (5*G* 6/1)	29–35
Sand, fine, clean, well-sorted; sparse very fine heavy minerals present; grades downward to sparsely lignitic, silty, clayey, medium to coarse sand; greenish gray (5*G* 6/1)	35–37
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), much denser than unit above, bluish gray (5*B* 5/1); burrows filled with fine sand from unit above extend downward to base of unit	37–40
Siltstone containing molds and casts of small clams and a chalky oyster fragment at base; dark greenish gray (5*GY* 3/1)	40–41

Base of upper Bacons Castle Formation (Moorings unit): +104 feet elevation
Base of upper Bacons Castle Formation (Barhamsville Member): +85 feet elevation

Bottomed in Yorktown Formation (zone 2)

Cherry Hill Quadrangle

CH–93–1: 5.04 miles west of eastern quadrangle border and 3.31 miles north of southern quadrangle border, near Abernathy Cemetery, in west-central 1/9th of map area (latitude 36.9233° N., longitude 77.5912° W.). Surface elevation about 285 feet.

LITHOLOGY	DEPTH IN FEET
Yorktown Formation (zone 3)	
Sand, fine, well-sorted, reddish brown (10*R* 5/7)	0–6
Sand, fine, well-sorted, clayey, finely micaceous, yellowish brown (7.5*YR* 5/8); rounded plinthite nodule present; stiff drilling	6–14
Sand, fine to medium, yellowish brown (7.5*YR* 5/8) (14–16 feet), grading down to moderate reddish brown (10*R* 4/6) (16–25 feet)	14–25
Sand, fine, silty; very fine heavy minerals abundant; pale reddish brown (10*R* 5/4) with mottles of dark yellowish orange (10*YR* 6/6) grading to all dark yellowish orange (10*YR* 6/6) (25–35 feet)	25–41
Sand, very fine to fine, soft, thixotropic; very fine dark heavy minerals abundant; discoidal quartz pebbles up to 3.5 cm in diameter present near base; dominantly very light gray (*N* 8) (41–46 feet) but near bottom dark yellowish orange (10*YR* 6/6) (46-48 feet)	41–48
Felsic Carolina slate belt rocks	
Clay, sandy(fine); very pale orange (10*YR* 8/2) to grayish orange (10*YR* 7/4)	48–51
Clay, sandy (fine to medium), micaceous, dark yellowish orange (10*YR* 6/6) grading down through yellowish brown (10*YR* 5/2) to dark yellowish brown (10*YR* 4/2) with streaks of bluish white (5*B* 9/1)	51–71

Base of Yorktown Formation (zone 3): **237 feet elevation**

Bottomed in felsic Carolina slate belt rocks

CH–93–2: 6.57 miles west of eastern quadrangle border and 3.69 miles north of southern quadrangle border, near Rocky Mountain Church, in west-central 1/9th of map area (latitude 36.9287° N., longitude 77.6189° W.). Surface elevation about 330 feet.

LITHOLOGY DEPTH IN FEET

Altamaha Formation

Large rounded quartz cobbles scattered across ground surface..... at 0

Felsic Carolina slate belt rocks

Clay, dry, crumbly, stiff and dense, moderate red (5*R* 4/6), moderate reddish brown (10*R* 4/6), and dark yellowish orange (10*YR* 6/6), very light gray (*N* 8) streaks are present below 6 feet 0–21

Base of Altamaha Formation: **Higher than +330 feet elevation**

Bottomed in felsic Carolina slate belt rocks

CH–93–3: 6.66 miles west of eastern quadrangle border and 4.66 miles north of southern quadrangle border, near radio tower, in west-central 1/9th of map area (latitude 36.9429° N., longitude 77.6205° W.). Surface elevation about 340 feet.

LITHOLOGY DEPTH IN FEET

Altamaha Formation

Clay, dense; large rotten quartzite clast present at base easily broken by hand; light brown (5*YR* 5/6) 0–3

Felsic Carolina slate belt rocks

Clay, dark yellowish orange (10*YR* 6/5) with mottles of very light gray (*N* 8)..... 3–6

Clay, moderate reddish brown (10*R* 4/6) grading down to dark yellowish brown (10*YR* 6/6) and moderate yellowish brown (10*YR* 5/4) with mottles of very light gray (*N* 8)..... 6–16

Base of Altamaha Formation: **+337 feet elevation**

Bottomed in felsic Carolina slate belt rocks

CH–93–4: 4.63 miles west of eastern quadrangle border and 4.90 miles north of southern quadrangle border, on southeastern side of intersection of Va. State Road 40 and Va. State Road 619, in west-central 1/9th of map area (latitude 36.9463° N., longitude 77.5837° W.). Surface elevation 242 feet.

LITHOLOGY DEPTH IN FEET

Yorktown Formation (zone 3)

Sand, fine to very coarse; contains scattered quartz granules down to 6 feet and rounded, polished elongate quartz pebbles up to 2 cm in diameter below 6 feet; red (7.5*R* 5/8) 0–9

Clay, sandy (fine), dark yellowish orange (10*YR* 6/5), very light gray (*N* 8), and moderate dusky red (5*R* 4/4) 9–11

Sand, fine to very coarse; contains elongate and polished quartz pebbles up to 2 cm in diameter; light brown (5*YR* 5/6 to 5*YR* 6/4) 11–16

Felsic Carolina slate belt rocks

Clay containing platy fragments of vein quartz; dark yellowish orange (10*YR* 6/6) and grayish orange (10*YR* 7/4), becoming very light gray (*N* 8) with streaks of pale red (10*R* 6/2) in basal foot 16–26

Base of Yorktown Formation (zone 3): **+226 feet above sea level**

Bottomed in felsic Carolina slate belt rocks

CH–93–5: 4.73 miles west of eastern quadrangle border and 5.91 miles north of southern quadrangle border, on southern side of intersection of Va. State Road 619 and Va. State Road 609, in northwestern 1/9th of map area (latitude 36.9613° N., longitude 77.5857° W.). Surface elevation 215 feet.

LITHOLOGY DEPTH IN FEET

Felsic Carolina slate belt rocks

Saprolite, clay 0–6

No coastal plain sediments present

Bottomed in felsic Carolina slate belt rocks

CH–93–6: 2.88 miles west of eastern quadrangle border and 6.28 miles north of southern quadrangle border, near 222-foot spot elevation, in north-central 1/9th of map area (latitude 36.9665° N., longitude 77.5518° W.). Surface elevation 221 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, very fine to coarse, mostly fine to medium, silty, light brown (5*YR* 5/6)	0–6
Sand, very fine to coarse, mostly fine to medium, silty; very fine dark heavy minerals and quartz granules present; yellowish brown (7.5*YR* 5/7)	6–11
Sand, very fine to coarse, mostly fine to medium, silty; dark very fine heavy minerals very abundant; dark yellowish orange (10*YR* 6/6)	11–17
Gravel containing rounded quartz pebbles up to 3 cm in diameter, in very fine to coarse sand matrix; dark yellowish orange (10*YR* 6/6)	17–18
Yorktown Formation (zone 3)	
Sand, medium to very coarse; contains scattered quartz granules and pebbles up to 1 cm in diameter; dark very fine heavy minerals abundant (10–15 percent of volume between 21 and 22 feet); dark yellowish brown (10*YR* 4/2)	18–22
Silt, very clayey, sandy (coarse), white (possible saprolitized granite clast)	22–22.5
Sand, coarse to very coarse; contains subangular to rounded quartz granules and pebbles up to 1 cm in diameter; yellowish gray (5*Y* 7/2)	22.5–27
Petersburg Granite	
Saprolite from granite, clay; contains large angular grains of black smoky quartz up to 1 cm in diameter; light brownish gray (5*YR* 6/1)	27–31

Base of Chowan River Formation: **+203 feet above sea level**
Base of Yorktown Formation (zone 3): **+194 feet above sea level**

Bottomed in saprolite from Petersburg Granite

CH–93–7: 3.19 miles west of eastern quadrangle border and 4.88 miles north of southern quadrangle border, at northeastern corner of intersection of Va. State Route 40 and Va. State Route 659, in central 1/9th of map area (latitude 36.9459° N., longitude 77.5578° W.). Surface elevation 221 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, very fine to coarse, silty, clayey, dark yellowish orange (10*YR* 6/6) grading down through light brown (5*YR* 5/6) to moderate brown (5*YR* 4/4)	0–11
Yorktown Formation (zone 3)	
Sand, fine to medium; dark very fine heavy minerals abundant; pale yellowish brown (10*YR* 6/2)	11–16
Sand, medium to coarse; dark very fine heavy minerals sparsely present; some sand intervals have a subordinate very coarse fraction and other intervals have a subordinate fine fraction; kaolinite ghosts of feldspar grains recognizable; pinkish gray (5*YR* 8/1)	16–44
Sand, medium to very coarse, gravelly with rounded quartz pebbles up to 3.5 cm in diameter; yellowish gray (5*Y* 8/1)	44–47
Aluminous Carolina slate belt rocks	
Saprolite, fine sand and clay; blades of staurolite present; dark yellowish orange (10*YR* 6/6)	47–51

Base of Chowan River Formation: **+210 feet above sea level**
Base of Yorktown Formation (zone 3): **+174 feet above sea level**

Bottomed in aluminous Carolina slate belt rocks

CH–93–8: 2.25 miles west of eastern quadrangle border and 5.00 miles north of southern quadrangle border, 0.2 mile north-northwest of intersection of Va. State Route 40 and Va. State Route 665 on western side of Va. State Route 665, in east-central 1/9th of map area (latitude 36.9479° N., longitude 77.5406° W.). Surface elevation about 200 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, fine to medium, silty, clayey; contains plinthite; reddish brown (10*R* 5/7)	0–6
Sand, medium to very coarse, poorly sorted; rounded quartz granules present from 6–15 feet; yellowish brown (7.5*YR* 5/7)	6–21
Sand, fine to medium, unit better sorted than above; rounded quartz pebbles up to 1 cm in diameter abundant from 23–26 feet; yellowish brown (7.5*YR* 5/7)	21–26
Yorktown Formation (zone 3)	
Sand, very fine to fine, silty; dark very fine heavy minerals abundant (5–10 percent of volume); pale yellowish orange (10*YR* 8/6); lower contact abrupt	26–30
Sand, coarse to very coarse, rounded, clean; a few clay lenses present near base; pale yellowish orange (10*YR* 8/6)	30–31
Petersburg Granite	
Saprolite from granite, clay with large crystals of angular dark gray smoky quartz; moderate yellowish brown (10*YR* 6/4); impenetrable rock at base of hole	31–37

Base of Chowan River Formation: **+174 feet above sea level**
Base of Yorktown Formation (zone 3): **+169 feet above sea level**

Bottomed in saprolite from Petersburg Granite

CH–93–9: 2.15 miles west of eastern quadrangle border and 4.99 miles north of southern quadrangle border, 0.2 mile north-northeast of intersection of Va. State Route 40 and Va. State Route 665, on western side of Va. State Route 665, in east-central 1/9th of map area (latitude 36.9476° N., longitude 77.5388° W.). Surface elevation 195 feet.

LITHOLOGY DEPTH IN FEET

Chowan River Formation

Sand, very fine to coarse, dominantly fine to medium, slightly silty; scattered quartz granules present between 6 and 11 feet; yellowish brown (7.5*YR* 5/7) (0-6 feet) grading down to grayish orange (10*YR* 7/4) and grayish orange pink (5*YR* 7/2) (6-11 feet) 0–11

Sand, very fine to coarse, dominantly fine to medium, slightly silty; scattered quartz granules present; sparse (about 1 percent) dark very fine heavy minerals present; grayish orange (10*YR* 7/4) and light brown (5*YR* 5/6)..... 11–16

Silt, very clayey, sandy (medium to coarse), moderate reddish orange (10*R* 6/6) with mottles of pale reddish brown (10*R* 5/4) and light gray (*N* 7)..... 16–17

Sand, dominantly fine to medium; quartz granules scattered throughout; sparse (about 1 percent) dark very fine heavy minerals present; grayish orange brown (5*YR* 7/4); lower contact gradational 17–21

Sand, medium to very coarse; contains quartz pebbles up to 1 cm in diameter; grayish orange brown (5*YR* 7/4) (21-25 feet) grading down to yellowish orange (10*YR* 7/6) (25-27 feet) 21–27

Gravel containing pebbles of brownish black (5*YR* 2/1), subangular smoky quartz up to 2.5 cm in diameter and rounded to discoidal vein quartz up to 5 cm in diameter 27–29

Petersburg Granite

Saprolite from granite, clay with subangular grains of smoky quartz; moderate yellowish brown (10*YR* 6/4) 29–31

Base of Chowan River Formation: **+166 feet above sea level**

Bottomed in saprolite from Petersburg Granite

CH–93–10: 4.12 miles west of eastern quadrangle border and 4.88 miles north of southern quadrangle border, on southern side of Va. State Route 40, 0.2 mile east of Millrun Branch, in central 1/9th of map area (latitude 36.9460° N., longitude 77.5746° W.). Surface elevation 212 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, very fine to very coarse, dominantly fine to medium, silty, moderately clayey to very clayey (4–5 feet), moderate brown (5*YR* 5/4) (0–4 feet) grading down to pale reddish brown (10*R* 5/4) and light gray (*N* 7)	0–6
Yorktown Formation (zone 3)	
Sand, fine to coarse; dark very fine heavy minerals abundant; quartz granules present from 11–12 feet; pale yellowish brown (10*YR* 6/2) (6–9 feet) grading down to dark yellowish orange (10*YR* 6/6)	6–12
Sand, very fine to coarse; dark very fine heavy minerals sparse in upper two-thirds but abundant in lower one third; dark yellowish orange (10*YR* 6/6)	12–13
Sand, fine to very coarse; contains subrounded pebbles of quartz up to 2 cm in diameter; sparse dark very fine heavy minerals present; yellowish gray (5*Y* 7/2) to light olive gray (5*Y* 5/2)	13–17
Sand, fine to very coarse, clayey and silty; contains abundant subrounded to rounded quartz pebbles up to 2 cm in diameter; dark yellowish brown (10*YR* 6/6)	17–20
Aluminous Carolina slate belt rocks	
Saprolite, silt, micaceous, clayey; very light gray (*N* 8) mica flakes present in dark yellowish orange (10*YR* 6/6) to very pale orange (10*YR* 8/2) matrix	20–21

Base of Chowan River Formation: **+206 feet above sea level**
Base of Yorktown Formation (zone 3): **+192 feet above sea level**

Bottomed in aluminous Carolina slate belt rocks

CH–93–11: 4.36 miles west of eastern quadrangle border and 7.69 miles north of southern quadrangle border, on eastern side of Va. State Route 619, 0.4 mile north-northwest of Wharfs Store, in north-central 1/9th of map area (latitude 36.9868° N., longitude 77.5789° W.). Surface elevation 254 feet.

LITHOLOGY DEPTH IN FEET

Yorktown Formation (zone 3)

Sand, dominantly very fine to fine but up to coarse, silty, plinthitic; subangular quartz pebble about 1 cm in diameter present near base; red (7.5*R* 5/7) 0–6

Petersburg Granite

Saprolite from granite, clay with angular quartz grains; moderate reddish brown (10*R* 4/6) and grayish orange (10*YR* 7/4) 6–11

Base of Yorktown Formation (zone 3): +248 feet above sea level

Bottomed in saprolite from Petersburg Granite

CH–93–12: 2.99 miles west of eastern quadrangle border and 8.24 miles north of southern quadrangle border, on southwestern corner of intersection of Va. State Route 609 and Va. State Route 664, in north-central 1/9th of map area (latitude 36.9950° N., longitude 77.5540° W.). Surface elevation 218 feet.

LITHOLOGY DEPTH IN FEET

Chowan River Formation

Sand, very fine to very coarse, silty, stiff, reddish brown (10*R* 5/7) 0–6

Sand, very fine to very coarse, silty; sparse dark very fine heavy minerals present; rounded quartz pebbles up to 1 cm in diameter also present; grayish orange (10*YR* 7/4) 6–11

Sand, dominantly medium, grading down to dominantly coarse sand; scattered quartz pebbles increase in size downward to a maximum diameter of 3 cm; yellowish gray (5*Y* 7/2) 11–19

Gravel containing rounded quartz pebbles up to 5 cm in diameter interspersed with subrounded smoky quartz granules; fine to very coarse quartz sand matrix with sparse very fine dark heavy minerals present; yellowish gray (5*Y* 7/2) 19–21

Petersburg Granite

Saprolite from granite, clay containing grains of angular, brownish black (5*YR* 2/1) smoky quartz and a 1-cm-wide muscovite book; dark yellowish orange (10*YR* 6/6) and very light gray (*N* 8) 21–26

Base of Chowan River Formation: +197 feet above sea level

Bottomed in saprolite from Petersburg Granite

CH–93–13: 2.28 miles west of eastern quadrangle border and 7.66 miles north of southern quadrangle border, on northern corner of intersection of Va. State Road 664 and unnumbered road, 0.1 mi. northwest of Boisseau Cemetery, in northeastern 1/9th of map area (latitude 36.9865° N., longitude 77.5409° W.). Surface elevation 191 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, fine to very coarse; contains rounded quartz granules; moderate reddish orange (10*R* 6/6)	0–4
Gravel in a sandy matrix; rounded quartz pebble 4 cm in diameter recovered, but very tough drilling suggests that there are much larger clasts present but not recovered and there are clasts in adjacent field that are up to 12 cm in diameter; moderate reddish orange (10*R* 6/6)	4–8
Petersburg Granite	
Saprolite from granite, clay with coarse grains of angular smoky quartz; moderate reddish brown (10*R* 4/6), pale yellowish orange (10*YR* 8/6), and very light gray (*N* 8)	8–11

Base of Chowan River Formation: **+183 feet above sea level**

Bottomed in saprolite from Petersburg Granite

CH–93–14: 0.33 mile west of eastern quadrangle border and 4.76 miles north of southern quadrangle border, on northern side of Va. State Road 40 immediately east of power line, in east-central 1/9th of map area (latitude 36.9442° N., longitude 77.5055° W.). Surface elevation 140 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, dominantly fine to medium with a minor coarse to very coarse fraction; sparse quartz pebbles up to 1 cm in diameter and sparse grains of dark very fine heavy minerals present; light olive gray (5*Y* 7/1) grading down through dark yellowish orange (10*YR* 6/6) to pale yellowish brown (10*YR* 7/2)	0–7
Silt, very clayey, sandy (fine), light gray (*N* 7)	7–7.5
Sand, very fine to very coarse, silty, dominantly coarse to very coarse at base with abundant quartz granules; grayish orange (10*YR* 7/4)	7.5–11
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), yellowish gray (5*Y* 8/1), grayish orange (10*YR* 7/4), and grayish orangish pink (5*YR* 7/2) (0–15 feet) grading down to light olive gray (5*Y* 7/1)	11–17
Sand, coarse; contains abundant subrounded to rounded quartz pebbles up to 3.5 cm in diameter; moderate yellowish brown (10*YR* 5/4)	17–18
Petersburg Granite	
Saprolite from granite, clay with angular smoky quartz grains; yellowish brown (5*YR* 5/2)	18–21

Base of lower Bacons Castle Formation: **+129 feet above sea level**
Base of Yorktown Formation (zone 2): **+122 feet above sea level**

Bottomed in saprolite from Petersburg Granite

CH–93–15: 0.60 mile west of eastern quadrangle border and 2.27 miles north of southern quadrangle border, at intersection of Va. State Route 681 and unnumbered road with 159-foot spot elevation, in southeastern 1/9th of map area (latitude 36.9097° N., longitude 77.4932° W.). Surface elevation 159 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Silt, very clayey, sandy (fine to medium), yellowish gray (5*Y* 7/2) grading down to medium light gray (*N* 6) streaked with light brown (5*YR* 5/6)	0–6
Silt, very clayey, sandy (very fine to fine), pale yellowish brown (10*YR* 6/2) and medium gray (*N* 5) grading down to light brownish gray (5*YR* 5/1) and pale olive (10*Y* 6/2 to 5*Y* 6/1)	6–9
Petersburg Granite	
Saprolite from granite, clay with coarse-grained, angular smoky quartz; light greenish gray (5*GY* 7/1) and very light gray (*N* 8)	9–11

Base of lower Bacons Castle Formation: **+150 feet above sea level**

Bottomed in saprolite from Petersburg Granite

CH–93–16: 1.85 miles west of eastern quadrangle border and 2.58 miles north of southern quadrangle border, on unnumbered road, 0.1 mile south of spillway for pond, 0.2 mile east of Harris Swamp stream, in southeastern 1/9th of map area (latitude 36.9127° N., longitude 77.5331° W.). Surface elevation 179 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine to coarse, silty and clayey; rounded quartz pebbles up to 1 cm in diameter scattered throughout; orangish brown (7.5*YR* 5/7)	0–6
Sand, medium to very coarse; quartz pebbles up to 1 cm in diameter very abundant; grayish orangish pink (5*YR* 7/2) grading down to light brown (5*YR* 6/4)	6–11
Gravel containing rounded to subrounded quartz pebbles up to 3 cm in diameter; medium to very coarse sand matrix; light brown (5*YR* 6/4)	11–13
Yorktown Formation (zone 3)	
Sand, very fine to fine, very light gray (*N* 8), interbedded with fine to medium, pale yellowish orange (10*YR* 8/6), well-sorted sand; dark very fine heavy minerals sparsely present	13–16
Sand, coarse to very coarse, rounded; contains rounded quartz pebbles up to 1 cm in diameter; kaolinite abundant in matrix; very light gray (*N* 8)	16–22
Sand, very fine to fine, well-sorted; dark very fine heavy minerals (1–2 percent by volume) present; matrix rich in kaolinite; very light gray (*N* 8)	22–27
Sand, fine to very coarse, poorly sorted; quartz pebbles up to 1 cm in diameter present; very light gray (*N* 8) grading down to dark yellowish orange (10*YR* 6/6)	27–29
Aluminous Carolina slate belt rocks	
Saprolite, clayey and muscovitic fine sand, dusky yellow (5*Y* 6/4), grading down to grayish brown (5*YR* 3/2), clayey and biotitic, fine sand; impenetrable layer at base	29–34

Base of lower Bacons Castle Formation: **+166 feet above sea level**
Base of Yorktown Formation (zone 3): **+150 feet above sea level**

Bottomed in saprolite from aluminous Carolina slate belt rocks

CH–93–17: 3.16 miles west of eastern quadrangle border and 2.79 miles north of southern quadrangle border, on western side of Va. State Route 665, 0.1 mile south of intersection with Va. State Route 617, in south-central 1/9th of map area (latitude 36.9154° N., longitude 77.5571° W.). Surface elevation 189 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, dominantly fine to medium, silty, clayey; dark very fine heavy minerals sparsely present at top but increasing to 1–2 percent by volume below 6 feet; dark yellowish brown (10*YR* 4/4) grading down through pale yellowish brown (10*YR* 6/2) (3–6 feet) and light brownish gray (5*YR* 6/1) (6–9 feet) to dark yellowish orange (10*YR* 6/6) (9–10 feet)	0–10
Silt, very clayey, sandy (very fine), grading down to clayey and silty fine sand; medium light gray (*N* 6)	10–11
Sand, very fine to fine; sparse dark very fine heavy minerals present; dark yellowish orange (10*YR* 6/6)	11–14
Silt, very clayey, sandy (very fine to fine), yellowish gray (5*Y* 7/2)	14–15
Sand, dominantly very fine to fine with minor medium to coarse fraction; sparse dark very fine heavy minerals present; medium yellowish orange (10*YR* 7/6); lower contact gradational	15–20
Sand, fine to medium, orangish brown (7.5*YR* 5/7); lower contact gradational	20–22
Sand, medium to coarse; contains rounded to subrounded quartz pebbles up to 2.5 cm in diameter at base; medium dark gray (*N* 4)	22–25
Aluminous Carolina slate belt rocks	
Saprolite, clay, sandy (very fine to fine); schist fragments present; dark gray (*N* 3); impenetrable bed at base	25–26

Base of Chowan River Formation: **+164 feet above sea level**

Bottomed in saprolite from aluminous Carolina slate belt rocks

CH–93–18: 4.24 miles west of eastern quadrangle border and 3.00 miles north of southern quadrangle border, 0.6 mile east-northeast of Bolsters Store on northwestern side of right-angle turn on Va. State Route 617, in central 1/9th of map area (latitude 36.9189° N., longitude 77.5766° W.). Surface elevation 262 feet.

LITHOLOGY DEPTH IN FEET

Yorktown Formation (zone 3)

Sand, dominantly fine but with minor very fine to coarse fractions, silty, clayey; contains rounded plinthite lumps up to 1 cm in diameter; reddish brown (10*R* 4/7) 0–6

Sand, dominantly very fine to fine with minor medium to coarse fractions; rounded plinthite lumps increase in abundance downward; reddish brown (10*R* 4/7) grading down to moderate reddish brown (10*R* 4/6) 6–11

Sand, very fine to very coarse; pebbly with sparse subrounded quartz pebbles up to 1 cm in diameter at top grading down to abundant rounded to subrounded quartz pebbles up to 2 cm in diameter at base; light brown (5*YR* 5/6) grading down to dark yellowish orange (10*YR* 6/6) 11–18

Felsic Carolina slate belt rocks

Saprolite, clay, sandy (fine to medium), dark yellowish orange (10*YR* 6/6) with streaks of very light gray (*N* 8) grading down to light brown (5*YR* 5/6) 18–31

Base of Yorktown Formation (zone 3): +244 feet above sea level

Bottomed in saprolite from felsic Carolina slate belt rocks

CH–93–19: 3.73 miles west of eastern quadrangle border and 3.57 miles north of southern quadrangle border, beside abandoned house, 0.9 mile north-northwest of intersection of Va. State Route 617 and Va. State Route 665, in central 1/9th of map area (latitude 36.9271° N., longitude 77.5674° W.). Surface elevation 220 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, fine to coarse, silty, reddish brown (10*R* 4/7); lower contact gradational	0–7
Sand, fine to very coarse; contains subrounded to subangular quartz granules that become more abundant downsection; light brown (5*YR* 5/6)	7–14
Yorktown Formation (zone 3)	
Sand, fine to medium; sparse well-rounded quartz granules present; grayish orange (10*YR* 7/4)	14–22
Sand, very fine to fine; contains about 1 percent dark very fine heavy minerals; pale yellowish orange (10*YR* 8/6)	22–24
Sand, very fine to medium; contains rounded to subrounded white quartz pebbles up to 2 cm in diameter and about 7 percent dark very fine heavy minerals; matrix rich in kaolin; grayish orange (10*YR* 7/4) and very light gray (*N* 8)	24–26
Sand, fine to medium; contains about 15–20 percent very fine dark heavy minerals; moderate yellowish brown (10*YR* 6/4) grading down to grayish orange (10*YR* 7/4)	26–29
Sand, very fine to fine; polished and well-rounded granules of quartz scattered throughout; contains about 35–40 percent dark very fine grained heavy minerals; rounded to subrounded quartz pebbles up to 3 cm in diameter present in basal foot (some oblate to discoidal in shape); yellowish gray (5*Y* 7/2) to light gray (*N* 7)	29–35

Sand, very fine; dark very fine heavy minerals abundant; sparse oblate to discoidal quartz pebbles up to 1 cm in diameter present in basal 2 feet; pinkish gray (5*YR* 7/1) 35–43

Aluminous slate belt rocks

Saprolite, clay, micaceous and sandy; dark yellowish orange (10*YR* 6/6) streaked dusky brown (5*YR* 2/2); lower contact somewhat gradational 43–46

Saprolite, clay, very micaceous; flattened angular quartz grains and chips of vein quartz abundant; garnetiferous; grayish green (5*GY* 6/1), greenish gray (5*GY* 7/1), grayish yellowish green (5*GY* 7/2), light red (5*R* 6/6), and very light gray (*N* 8) 46–51

Base of Chowan River Formation: **+206 feet above sea level**
Base of Yorktown Formation (zone 3): **+177 feet above sea level**

Bottomed in saprolite from aluminous Carolina slate belt rocks

CH–93–20: 3.91 miles west of eastern quadrangle border and 3.13 miles north of southern quadrangle border, 0.9 mile east-northeast of Bolsters Store on unnumbered road, 0.15 mile north of Va. State Route 617 at 241-foot spot elevation, in central 1/9th of map area (latitude 36.9208° N., longitude 77.5709° W.). Surface elevation 240 feet.

LITHOLOGY	DEPTH IN FEET
Yorktown Formation (zone 3)	
Sand, very fine to coarse, clayey, silty, dark reddish brown (10*R* 3/6); lower contact gradational	0–9
Sand, very fine to coarse; contains lenses of rounded quartz pebbles up to 1 cm in diameter; dark reddish brown (10*R* 3/6)	9–15
Sand, very fine to coarse; dark very fine heavy minerals abundant; dark yellowish orange (10*YR* 6/6)	15–21
Sand, fine to medium; quartz pebbles abundant down to 25 feet; dark very fine heavy minerals abundant throughout; dark yellowish orange (10*YR* 6/6)	21–28
Felsic Carolina slate belt rocks	
Saprolite, clay, sparse sand (very fine); black blebs scattered throughout (weathered mafic minerals?); dark yellowish orange (10*YR* 6/7)	28–36

Base of Yorktown Formation (zone 3): **+212 feet above sea level**

Bottomed in saprolite from felsic Carolina slate belt rocks

CH–93–21: 1.73 miles west of eastern quadrangle border and 0.99 mile north of southern quadrangle border, 0.45 mile southeast of Mayes Cemetery, 0.05 mile southeast of 180-foot spot elevation at right-angle bend in Va. State Route 649, in southeastern 1/9th of map area (latitude 36.8895° N., longitude 77.5284° W.). Surface elevation 178 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine to very coarse, contains quartz pebbles, silty and clayey; orange (5*YR* 5/7) grading down to orange with very light gray (*N* 8) streaks at base	0–11
Sand, fine to coarse, clayey and silty; contains subrounded quartz granules; orange (10*YR* 6/7) grading down to yellowish orange (10*YR* 7/6)	11–28
Silt, very clayey, sandy (fine), micaceous, yellowish orange (10*YR* 7/6)	28–29
Sand, fine to very coarse; contains rounded quartz pebbles up to 2 cm in diameter; yellowish orange (10*YR* 7/6)	29–30
Sand, coarse to very coarse; contains quartz pebbles up to 4 cm in diameter; yellowish orange (10*YR* 7/6)	30–31
Yorktown Formation (zone 3)	
Sand, very fine; contains sparse dark very fine minerals and polished quartz granules; grayish orange (10*YR* 7/4) grading down to dark yellowish brown (10*YR* 4/2)	31–34
Yorktown Formation (zone 2)	
Silt, clayey, interbedded with silty, very fine sand; grayish yellow (5*Y* 8/4)	34–38
Sand, mostly very fine to fine but with minor medium to very coarse fraction; contains sparse quartz pebbles up to 3 cm in diameter; grayish yellow (5*Y* 8/4)	38–41

Aluminous Carolina slate belt rocks

Saprolite, micaceous clay interlayered with platy angular quartz grains; probably some staurolite present; white (*N* 9), gray (*N* 5), and black (*N* 1) with yellowish and orangish staining; originally a quartz-muscovite-biotite schist 41–42

Base of lower Bacons Castle Formation: +147 feet above sea level
Base of Yorktown Formation (zone 3): +144 feet above sea level
Base of Yorktown Formation (zone 2): +137 feet above sea level

Bottomed in saprolite from aluminous Carolina slate belt rocks

CH–93–22: 1.01 miles west of eastern quadrangle border and 7.27 miles north of southern quadrangle border, at 168-foot spot elevation on western side of Va. State Route 664, in northeastern 1/9th of map area (latitude 36.9808° N., longitude 77.5182° W.). Surface elevation 168 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine with scattered quartz grains up to very coarse, silty and clayey; variably moderate reddish brown (10*R* 4/6), dark yellowish orange (10*YR* 6/6), yellowish gray (5*Y* 8/1), and light gray *(N* 7); lower contact gradational	0–7
Sand, very fine to very coarse, modally medium to coarse, dark yellowish orange (10*YR* 6/6) grading down through light gray (*N* 7) (8.5–9 feet) and dark reddish brown (10*R* 3/6) (9–11 feet) to light brown (5*YR* 6/4) (11–20 feet); subrounded to subangular quartz pebbles up to 2 cm in diameter present in basal foot	7–20
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine to fine); very fine sand fraction includes dark heavy minerals below 27 feet; yellowish gray (5*Y* 7/2) grading through very light olive gray (5*Y* 7/1) (22–32 feet) to medium dark bluish gray (5*B* 4/1)	20–37
Gravel containing vein quartz pebbles up to 5.5 cm in diameter; well rounded to subrounded, medium dark bluish gray (5*B* 4/1); very tough drilling	37–41
Petersburg Granite	
Wisps of saprolite, composed of clay with angular quartz grains; medium gray (*N* 5) and dark greenish gray (5*G* 4/1); refusal on hard rock	at 41

Base of lower Bacons Castle Formation: **+148 feet above sea level**
Base of Yorktown Formation (zone 2): **+127 feet above sea level**

Bottomed on Petersburg Granite

CH–93–23: 0.82 mile west of eastern quadrangle border and 8.52 miles north of southern quadrangle border, near northern map border at T-intersection of unnumbered private roads, in northeastern 1/9th of map area (latitude 36.9990° N., longitude 77.5147° W.). Surface elevation 165 feet.

LITHOLOGY DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, very fine with scattered quartz grains up to very coarse, silty and clayey, light brown (5*YR* 5/6); lower contact somewhat gradational 0–6

Sand, dominantly medium to coarse, grading down to coarse to very coarse sand in basal foot; silty; scattered very fine to very coarse grains present throughout; dusky red (5*R* 3/4) with mottles of light brownish gray (5*YR* 6/1) and orangish gray (10*YR* 7/4) 6–9

Chowan River Formation

Silt, clayey, sandy (fine to medium), light gray (*N* 7), pale red (5*R* 6/2), and light brown (5*YR* 6/4) 9–11

Sand, dominantly fine with scattered grains up to coarse, silty, light gray (*N* 7), pale red (5*R* 6/2), moderate red (5*R* 4/6), and light brown (5*YR* 6/4) 11–20

Yorktown Formation (zone 2)

Silt, very clayey, sandy (very fine), moderate red (5*R* 4/6) and light red (5*R* 5/6) 20–21

Sand, very fine, silty, pale reddish brown (10*R* 5/4) grading down to light brown (5*YR* 6/4) 21–24

Silt, clayey, dusky yellow (5*Y* 6/4); lower contact somewhat gradational 24–26

Silt, clayey, pale olive (10*Y* 6/2) with semi-indurated light brown (5*YR* 5/6) mottles; lower contact somewhat gradational 26–33

Silt, clayey, light gray (*N* 7) grading down to dark bluish gray (5*B* 4/1); contains lenses of very fine, clean, micaceous sand 33–37

Gravel containing subrounded quartz clasts up to 2 cm in diameter; one 3-cm-long chip present from a much larger white (*N* 9) flint pebble or cobble; smaller chips of dark gray (*N* 3) quartzite also present with their unbroken surfaces smooth..... 37–38

Petersburg Granite(?)

No penetration; stopped on top of granite or perhaps very large cobble or boulder ..... at 38

Base of lower Bacons Castle Formation: **+156 feet above sea level**
Base of Chowan River Formation: **+145 feet above sea level**
Base of Yorktown Formation (zone 2): **+128 feet above sea level**

Bottomed on Petersburg Granite(?)

CH–93–24: 1.72 miles west of eastern quadrangle border and 6.36 miles north of southern quadrangle border, 1.0 mile northwest of Lloyds Church on western side of unnumbered private road, in northeastern 1/9th of map area (latitude 36.9676° N., longitude 77.5307° W.). Surface elevation 165 feet.

LITHOLOGY DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, mostly fine but ranging from very fine to coarse, silty, light gray (*N* 7) and dark yellowish orange (10*YR* 6/6) 0–6

Sand, fine to medium grading down to coarse to very coarse, subrounded to subangular; subrounded to subangular quartz pebbles up to 4 cm in diameter in basal foot; light gray (*N* 7) and dark yellowish orange (10*YR* 6/6)..... 6–10

Petersburg Granite

Saprolite from granite; clay, grayish yellow (5*Y* 8/4), light olive gray (5*Y* 5/2), and dark yellowish brown (10*YR* 3/2) grading down to very light gray (*N* 8); contains grains of angular, coarse, dark gray (*N* 3) quartz 10–11

Base of lower Bacons Castle Formation: +155 feet above sea level

Bottomed in saprolite from Petersburg Granite

CH–93–25: 0.19 mile west of eastern quadrangle border and 5.57 miles north of southern quadrangle border, on Va. State Route 663, 0.8 mile east-southeast of Lloyds Church, in east-central 1/9th of map area (latitude 36.9563° N., longitude 77.5032° W.). Surface elevation 135 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Bahramsville Member)	
Sand, dominantly fine to medium but ranging from very fine to coarse, grading through dominantly medium to coarse to dominantly coarse to very coarse, silty; subangular to rounded quartz pebbles up to 3 cm in diameter abundant; dark yellowish orange (10*YR* 6/6)	0–5
Gravel containing subrounded to subangular quartz clasts up to 3 cm in diameter; matrix composed of clay and coarse to very coarse rounded to angular quartz sand; grayish yellow (5*Y* 8/4), very light gray (*N* 8), and medium light gray (*N* 6)	5–7
Petersburg Granite	
Saprolite from granite, clay, grayish orange (10*YR* 7/4) with very coarse, angular, dark gray (*N* 3) quartz grains; refusal at 10 feet	7–10

Base of lower Bacons Castle Formation: **+128 feet above sea level**

Bottomed in saprolite from Petersburg Granite

CH–93–26: 0.99 mile west of eastern quadrangle border and 3.75 miles north of southern quadrangle border, on southern side of abandoned house, 0.05 mile east of power line and 0.05 mile southeast of Dinwiddie-Sussex county line, in east-central 1/9th of map area (latitude 36.9296° N., longitude 77.5176° W.). Surface elevation 180 feet.

LITHOLOGY DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, very fine to very coarse, silty; contains sparse quartz granules; orangish brown (7.5*YR* 5/7) grading down to reddish brown (10*R* 4/7); rounded quartz pebbles up to 2 cm in diameter present in basal half-foot 0–7

Yorktown Formation (zone 3)

Sand, very fine to fine with sparse medium to coarse grains, silty, clayey; muscovite flakes scattered throughout; very fine dark heavy minerals present; reddish brown (10*R* 4/7) with yellowish gray mottles (5*Y* 8/1)..... 7–11

Sand, very fine to fine, silty; contains occasional polished rounded quartz pebbles up to 1 cm in diameter; light brown (5*YR* 5/6) grading down through light brown (5*YR* 5/7) (14–21 feet) to grayish orange (10*YR* 7/4) 11–24

Silt, very clayey, 4-inch-thick layer, light brown (5*YR* 5/7) with very light gray *(N* 8) mottles ..... at 24

Sand, dominantly very fine to fine but with significant medium to coarse fraction; 3-cm-long polished quartz discoid present at top; subrounded to subangular quartz pebbles up to 2 cm in diameter present at 29 feet; dark yellowish orange (10*YR* 6/6) grading down to yellowish orange (10*YR* 7/6) 24–32

Sand, fine to medium, dense; sparse very fine dark heavy minerals present; yellowish orange (10*YR* 7/6)..... 32–35

Petersburg Granite(?)

No penetration; presumed contact with granite ..... at 35

Base of lower Bacons Castle Formation: **+173 feet above sea level**
Base of Yorktown Formation (zone 3): **+145 feet above sea level**

Bottomed on Petersburg Granite(?)

CH–93–27: 2.88 miles west of eastern quadrangle border and 3.93 miles north of southern quadrangle border, on eastern side of Va. State Route 665, 0.27 mile south-southwest of intersection with Va. State Route 659, in central 1/9th of map area (latitude 36.9322° N., longitude 77.5520° W.). Surface elevation 210 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, very fine to fine with minor medium to coarse fraction, silty, humic, dark yellowish brown (10*YR* 4/4)	0–1
Sand, very fine to fine with minor medium to coarse, silty; sparse very fine dark heavy minerals present; plinthite nodules present from 6–8 feet; orangish brown (7.5*YR* 5/7) grading down through reddish brown (10*R* 4/7) (6–8 feet) to light brown (5*YR* 5/6)	1–10
Silt, very clayey, sandy (fine), light gray (*N* 7), 2-inch-thick layer	at 10
Sand, very fine to fine, silty, coarsens down section; contains 1–2 percent very fine dark heavy minerals; dark yellowish orange (10*YR* 6/6) grading down to grayish orange (10*YR* 7/4) at base	10–16
Sand, fine to medium; polished quartz granules and well-rounded, medium to coarse quartz grains abundant; contains clump of iron-cemented quartz grains, 1.5 cm in diameter; grayish orange (10*YR* 7/4) grading down through pale orange (10*YR* 7/2) to grayish orangish pink (5*YR* 7/2)	16–19
Yorktown Formation (zone 3)	
Sand, very fine to fine; scattered, polished medium to coarse grains present; contains about 2-3 percent very fine dark heavy minerals; well-rounded quartz granules and small ellipsoidal quartz pebbles up to 2 cm in diameter scattered throughout; sparse muscovite flakes near base; yellowish gray (5*Y* 8/1) grading down to yellowish gray (5*Y* 7/2)	19–44

Sand, mostly medium to very coarse but with a minor fine fraction, polished and subrounded grains, grading down to mostly very fine to fine sand with about 2 percent very fine dark heavy minerals; yellowish gray (5*Y* 7/2) 44–48

Silt, very clayey, yellowish gray (5*Y* 7/2), about 4 inches thick..... at 48

Sand, dominantly very fine to fine with medium to very coarse polished and subrounded grains; contains polished and rounded to discoidal quartz pebbles up to 4 cm in diameter; yellowish gray (5*Y* 7/2) interbedded with yellowish brown (10*YR* 5/6) layers; basal pebbles stained brownish gray (5*YR* 3/1) and yellowish gray (5*Y* 7/2)..... 48–50

Aluminous Carolina slate belt rocks

Saprolite, predominantly composed of very muscovitic and graphitic(?) schist; contains garnets up to 0.5 cm in diameter; moderate brown (5*YR* 4/4) grading down to bluish gray (5*B* 6/1)..... 50–51

Base of Chowan River Formation: **+191 feet above sea level**
Base of Yorktown Formation (zone 3): **+160 feet above sea level**

Bottomed in saprolite from aluminous Carolina slate belt rocks

CH–93–28: 2.99 miles west of eastern quadrangle border and 0.25 mile north of southern quadrangle border, 0.58 mile west-southwest of bridge where Va. State Route 616 crosses Stewart Branch on northern side of abandoned house, 0.82 mile east-southeast of intersection of Va. State Route 619 and Va. State Route 616, in south-central 1/9th of map area (latitude 36.8791° N., longitude 77.5540° W.). Surface elevation 219 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, very fine to fine with scattered rounded medium to coarse fraction; medium to coarse fraction decreases downward; silty, moderate yellowish brown (10*YR* 5/4) grading down through light brown (5*YR* 4/6) (2–4 feet) through reddish brown (10*YR* 4/7) (4–6 feet) through brick red (10*R* 5/7) (6–14 feet) through light brown (5*YR* 4/6) (14–16 feet) through moderate reddish brown (10*R* 4/6) (16–22 feet) to grayish orange (10*YR* 7/4) near base	0–23
Silt, very clayey, moderate red (5*R* 4/6) with light greenish gray (5*GY* 8/1) mottles grading down through dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) mottles to entirely very light gray (*N* 8) by 26 feet	23–29
Yorktown Formation (zone 3)	
Sand, very fine to very coarse; coarse to very coarse fraction well rounded; contains 1–2 percent very fine dark heavy minerals; scattered dark and light well-rounded quartz pebbles up to 2 cm in diameter present but more abundant downward; grayish orange (10*YR* 7/4)	29–41
Sand, very fine to very coarse; gravelly with rounded to subrounded quartz clasts up to 3.5 cm in diameter; grayish orange (10*YR* 7/4)	41–43
Sand, very fine, silty; contains about 2 percent very fine dark heavy minerals; yellowish brown (10*YR* 6/4); some scattered rounded coarse to very coarse grains of smoky quartz present; rounded clasts of dark quartz up to 2 cm in diameter present at base	43–45

Felsic Carolina slate belt rocks

Saprolite, predominantly composed of sandy (very fine) clay;
yellowish orange (10*YR* 7/6) with streaks of light gray (*N* 7);
sparse, angular, medium to coarse quartz grains present..... 45–51

Base of Chowan River Formation: **+190 feet above sea level**
Base of Yorktown Formation (zone 3): **+174 feet above sea level**

Bottomed in saprolite from felsic Carolina slate belt rocks

CH–93–29: 2.22 miles west of eastern quadrangle border and 0.18 mile north of southern quadrangle border, 0.25 mile southeast of bridge over Stewart Branch on northeastern side of Va. State Route 616, in southeastern 1/9th of map area (latitude 36.8777° N., longitude 77.5400° W.). Surface elevation 180 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine to very coarse, clayey, silty, dark yellowish orange (10*YR* 6/6)	0–6
Sand, very fine to very coarse, pebbly with subrounded to subangular quartz clasts up to 2 cm in diameter, dark yellowish orange (10*YR* 6/6) with streaks of light gray (*N* 7) and light brown (5*YR* 6/4)	6–16
Chowan River Formation	
Sand, very fine to fine, silty; sparse very fine dark heavy minerals present; pale yellowish orange (10*YR* 8/6)	16–26
Sand, very fine to fine with scattered medium to coarse; 1–2 percent very fine dark heavy minerals present; yellowish orange (10*YR* 7/6) grading down to yellow (5*Y* 7/4)	26–30
Sand, dominantly fine to medium, grading down by 33 feet to dominantly medium to coarse; scattered rounded quartz pebbles up to 3 cm in diameter present; 2–4 percent very fine dark heavy minerals present; yellowish orange (10*YR* 7/6)	30–43
Gravel containing rounded to subrounded dark quartz pebbles up to 3 cm in diameter in coarse to very coarse sand matrix; yellowish orange (10*YR* 7/6)	43–44
Aluminous Carolina slate belt rocks	
Saprolite, predominantly composed of moderate yellowish brown (10*YR* 5/4), sandy (fine to medium), silty clay	44–46

Base of lower Bacons Castle Formation: **+164 feet above sea level**
Base of Chowan River Formation: **+136 feet above sea level**

Bottomed in saprolite from aluminous Carolina slate belt rocks

CH–93–30: 2.45 miles west of eastern quadrangle border and 0.37 mile north of southern quadrangle border, 0.05 mile west-northwest of bridge over Stewart Branch on northern side of Va. State Route 616, in south-central 1/9th of map area (latitude 36.8804° N., longitude 77.5441° W.). Surface elevation 150 feet.

LITHOLOGY DEPTH IN FEET

Alluvium

Sand, very fine to fine, loose; scattered pebbles up to 2 cm in diameter present with a slightly greater concentration near base; yellowish gray (5*Y* 8/1) to olive gray (5*Y* 4/1)..... 0–3

Chowan River Formation

Sand, dominantly very fine to fine but with medium to coarse fraction, clayey; very fine dark heavy minerals abundant; pebbles up to 2 cm in diameter on basal contact; dark yellowish orange (10*YR* 6/6)..... 3–10

Aluminous Carolina slate belt rocks

Saprolite, predominantly composed of clay with rock fragments; blebs of quartz present; dark yellowish orange (10*YR* 6/6) grading down to dusky yellow (5*Y* 6/4); refusal at base..... 10–32

Base of alluvium: **+147 feet above sea level**
Base of Chowan River Formation: **+140 feet above sea level**

Bottomed in saprolite from aluminous Carolina slate belt rocks

CH–93–31: 0.88 mile west of eastern quadrangle border and 0.73 mile north of southern quadrangle border, 0.41 mile north-northwest of Barnes Cemetery on northeastern side of Va. State Route 649, in southeastern 1/9th of map area (latitude 36.8859° N., longitude 77.5158° W.). Surface elevation 171 feet.

LITHOLOGY DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, very fine to fine with scattered medium to coarse grains that become more abundant downward, silty, clayey, becoming more clayey downward; thin stringers of medium to coarse sand between clay laminae present below 6 feet; dark yellowish orange (10*YR* 6/6) with light gray (*N* 7) and moderate reddish brown (10*R* 5/5) mottles, grading by 6 feet to light gray (*N* 7) with moderate red (5*R* 5/4) mottles..... 0–10

Sand, very fine to fine; well sorted but with bimodal scattered medium to coarse grains present; light gray (*N* 7), moderate red (5*R* 5/4), and pale red (5*R* 6/2) 10–11

Sand, very fine to very coarse, clayey, silty; quartz granules scattered throughout; dark yellowish orange (10*YR* 6/6); 6-inch-thick very sandy clay lense at 16 feet;; pale brownish gray (5*YR* 6/1) 11–18

Sand, very fine to very coarse; contains abundant rounded to subrounded quartz pebbles up to 1 cm in diameter; pale brownish gray (5*YR* 6/1) 18–20

Sand, very fine to very coarse, clayey; broken up lenses of dense clay present; rounded dark quartz pebbles up to 3 cm in diameter on basal contact; yellowish gray (5*Y* 8/1)..... 20–29

Petersburg Granite

Saprolite; refusal at 30 feet 29–30

Base of lower Bacons Castle Formation: **+142 feet above sea level**

Bottomed on Petersburg Granite

CH–93–32: 2.43 miles west of eastern quadrangle border and 1.85 miles north of southern quadrangle border, 0.47 mile west of Harris Swamp on northeastern side of private road, 0.36 mile north of Va. State Route 681, in south-central 1/9th of map area (latitude 36.9020° N., longitude 77.5439° W.). Surface elevation 175 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine to very coarse, silty, clayey; quartz granules and pebbles up to 1 cm in diameter present in upper 6 feet; moderate red (5*R* 5/4) to pale reddish brown (10*R* 5/4) grading by 6 feet to moderate reddish orange (10*R* 6/6)	0–10
Silt, very clayey, sparsely to abundantly sandy, moderate reddish orange (10*R* 6/6) streaked with very light gray (*N* 8)	10–11
Sand, dominantly medium to coarse; rounded quartz pebbles up to 1 cm in diameter abundant; moderate reddish orange (10*R* 6/6)	11–12
Sand, very fine to fine with bimodal medium to coarse well-rounded fraction; very fine dark heavy minerals present; moderate reddish orange (10*R* 6/6)	12–14
Silt, very clayey, sandy, very light gray (*N* 8) with pale reddish purple (5*RP* 6/2) and moderate red (5*R* 4/6) mottles	14–16
Sand, dominantly very fine to fine; very fine dark heavy minerals moderately abundant; bimodal coarse to very coarse fraction present, which increases in abundance downward; pale yellowish gray (5*Y* 9/1) grading down to white (*N* 9)	16–21
Sand, medium to coarse; rounded quartz pebbles up to 1 cm in diameter present; white (*N* 9)	21–23
Chowan River Formation	
Sand, very fine to fine, very well sorted; very fine dark heavy minerals sparsely present to moderately abundant; yellowish gray (5*Y* 8/1)	23–26

Sand, very fine to fine but with a bimodal medium to coarse fraction; rounded quartz pebbles up to 5 cm in diameter and one quartz discoid 7 cm in diameter present; brownish gray (5*YR* 4/1) with dusky yellow (5*Y* 6/4) to dark yellowish orange (10*YR* 6/6) mottles 26–27

Aluminous Carolina slate belt rocks

Saprolite, predominantly composed of carbonaceous, very micaceous, sandy clay; brownish gray (5*YR* 4/1) with mottles of dusky yellow (5*Y* 6/4) and dark yellowish orange (10*YR* 6/6) 27–28

Base of lower Bacons Castle Formation: **+152 feet above sea level**
Base of Chowan River Formation: **+148 feet above sea level**

Bottomed in saprolite from aluminous Carolina slate belt rocks

CH–93–33: 3.40 miles west of eastern quadrangle border and 0.57 miles north of southern quadrangle border, on southern side of Va. State Route 616, 0.32 mile east-southeast of intersection with Va. State Route 619 near 239-foot spot elevation, in south-central 1/9th of map area (latitude 36.8834° N., longitude 77.5610° W.). Surface elevation 241 feet.

LITHOLOGY	DEPTH IN FEET
Yorktown Formation (zone 3)	
Sand, very fine to fine with scattered rounded very coarse grains present; rounded plinthite lumps up to 1 cm in diameter abundant; dark yellowish orange (10*YR* 6/6)	0–4
Felsic Carolina slate belt rocks	
Saprolite, sand, very fine to fine; tough clay matrix; moderate red (5*R* 4/6) to pale yellowish orange (10*YR* 8/6)	4–6
Saprolite, clay, sandy (fine to medium) with dark and angular sand grains; moderate red (5*R* 4/6) to pale yellowish orange (10*YR* 8/6) grading by 11 feet to dark yellowish orange (10*YR* 6/6); bands of white (*N* 9) present below 19 feet	6–21

Base of Yorktown Formation (zone 3): **+237 feet above sea level**

Bottomed in saprolite from felsic Carolina slate belt rocks

Claresville Quadrangle

CL–1: 0.85 mile southeast of Concord Church, opposite 92-foot benchmark on unnumbered road, in southwestern 1/9th of map area (latitude 36.5198° N., longitude 77.4613° W.). Surface elevation 93 feet.

LITHOLOGY	DEPTH IN FEET
Artificial fill composed of pebbly sand	0–2
Alluvium	
Sand, very fine to fine, silty, finely micaceous, brownish gray (5*YR* 4/1) grading down to light brownish gray (5*YR* 6/1); in basal foot grades to medium coarse sand with rounded quartz pebbles up to 3 cm in diameter	2–8
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, fine to medium, well-sorted, grayish yellow (5*YR* 8/4); lower contact somewhat gradational	8–8.5
Sand, coarse to very coarse, granular, orange (5*YR* 6/7) grading down to moderate reddish brown (10*R* 4/6)	8.5–12.5
Gravel containing quartz pebbles up to 1 cm in diameter in coarse to very coarse sand matrix; moderate reddish brown (10*R* 4/6)	12.5–13
Chowan River Formation	
Silt, sandy (very fine), finely micaceous; burrows present in top of bed filled with coarse sand; very fine sand lenses or filled burrows occur throughout interval; bluish gray (5*B* 5/1)	13–27
Sand, fine, grading down to medium sand with minor fraction of coarse, medium dark gray (*N* 4) sand	27–31
Sand, medium to coarse, poorly sorted; clay balls and shell chips present below 43 feet; subangular metavolcanic clast 3 cm in diameter present on basal contact; bluish gray (5*B* 5/1)	31–51
Yorktown Formation (zone 2)	
Sand, very fine, locally interbedded with silty and clayey lenses; bluish gray (5*B* 5/1); lower contact gradational	51–57

Silt, sandy (very fine), dense, finely micaceous, greenish gray (5*G* 5/1); lower contact gradational 57–73

Sand, fine, grading rapidly down through medium to coarse to very coarse and granular sand; greenish gray (5*G* 5/1) 73–79

Clubhouse Formation

Silt, very clayey, dense, very light gray (*N* 8) grading down to moderate brown (5*YR* 5/5) with very light gray (*N 8*) mottles 79–81

Base of alluvium:	**+85 feet above sea level**
Base of upper Bacons Castle Formation:	**+80 feet above sea level**
Base of Chowan River Formation:	**+42 feet above sea level**
Base of Yorktown Formation (zone 2):	**+14 feet above sea level**

Bottomed in Clubhouse Formation

CL–2: In Fountains Creek valley at entrance to dirt road on southeastern side of Va. State Road 625, 0.05 mile east of 55-foot bench mark, in central 1/9th of map area (latitude 36.5620° N., longitude 77.4404° W.). Surface elevation 55 feet.

LITHOLOGY	DEPTH IN FEET
Chuckatuck Formation	
Sand, very fine to fine, grayish yellow (5*Y* 8/4) grading down to dark yellowish orange (10*YR* 6/6)	0–1
Sand, very fine to fine, clayey and silty, dark yellowish orange (10*YR* 6/6) and very light gray (*N* 8); lower contact somewhat gradational	1–5
Sand, coarse to very coarse, poorly sorted; well-rounded quartz granules and pebbles up to 4 cm in diameter abundant; very pale orange (10*YR* 8/2)	5–9
Sand, coarse to very coarse, poorly sorted, clayey; well-rounded quartz granules and pebbles up to 4 cm in diameter abundant; light gray (*N* 7)	9–10
Eastover Formation	
Sand, fine, grading down to medium, well-sorted, sparsely shelly sand; greenish gray (5*GY* 4/1)	10–21
Sand, medium to coarse, clayey; rounded quartz pebbles up to 1 cm in diameter present; greenish gray (5*GY* 5/1)	21–22
Patuxent Formation	
Sand, fine, coarsely micaceous, kaolin-rich; upper foot burrowed; light gray (*N* 9)	22–26

Base of Chuckatuck Formation: **+45 feet above sea level**
Base of Eastover Formation: **+33 feet above sea level**

Bottomed in Patuxent Formation

CL–3: On northeastern side of abandoned house, 0.85 mile north-northeast of Fountain Grove Church and 0.3 mile west of eastern quadrangle border, in northeastern 1/9th of map area (latitude 36.5850° N., longitude 77.3811° W.). Surface elevation 55 feet.

LITHOLOGY	DEPTH IN FEET
Chuckatuck Formation	
Sand, very fine, silty, clayey, orange (5*YR* 5/7); lower contact gradational	0–5
Sand, fine, well-sorted, finely micaceous, grayish orange (10*YR* 7/4); lower contact gradational	5–10
Sand, medium, grading down to coarse, grayish orange (10*YR* 7/4) sand; lower contact gradational	10–14
Sand, coarse to very coarse; rounded quartz granules and pebbles abundant; yellowish gray (5*Y* 8/2)	14–16
Eastover Formation	
Sand, fine, well-sorted, clean; upper foot burrowed and filled with coarse sand from unit above; greenish gray (5*GY* 4/1)	16–29
Sand, fine to medium; rounded quartz pebbles up to 1 cm in diameter abundant; greenish gray (5*GY* 4/1)	29–30
Clubhouse Formation	
Silt, clayey, sticky, massive, grading down to poorly sorted, silty and clayey sand; upper foot burrowed and filled with sand from unit above; bluish gray (5*B* 5/1)	30–36
Silt, very clayey, stiff, reddish brown (10*R* 4/6) with medium gray (*N* 5) mottles, grading down through unmottled pale orange (10*YR* 8/3) (44–47 feet) to dusky yellow (5*Y*6/4) with pale red (5*R* 6/2) and light gray (*N* 7) mottles	36–51

Base of Chuckatuck Formation: **+39 feet above sea level**
Base of Eastover Formation: **+25 feet above sea level**

Bottomed in Clubhouse Formation

CL–4: On dirt road, 0.05 mile north of intersection with Va. State Route 660 at 80-foot spot elevation, on eastern bank of Mill Swamp, in northwestern 1/9th of map area (latitude 36.6096° N., longitude 77.4845° W.). Surface elevation 81 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, medium to coarse, angular, silty, pebbly, dark yellowish orange (10*YR* 6/6)	0–1
Sand, fine to very fine, silty, clayey, grading down to finely micaceous, dense, clayey, silty, very fine sand; dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) mottles	1–21
Sand, fine to medium, medium brown (5*YR* 5/5)	21–22
Sand, medium to coarse, granular, dark yellowish orange (10*YR* 6/6) grading down to pale orange (10*YR* 8/2)	22–33
Sand, dominantly coarse; subangular to rounded quartz pebbles up to 3 cm in diameter abundant; pale orange (10*YR* 8/2)	33–37
Patuxent Formation	
Sand, medium to very coarse, coarsely micaceous, dense, stiff; contains clay balls and rounded to subrounded polished quartz pebbles; pinkish gray (5*YR* 8/2)	37–41

Base of Windsor Formation: **+44 feet above sea level**

Bottomed in Patuxent Formation

CL–5: On eastern side of unnumbered road, 0.15 mile south of southern end of dam for Jordans Millpond and 0.05 mile north of 96-foot spot elevation, in south-central 1/9th of map area (latitude 36.5170° N., longitude 77.4250° W.). Surface elevation 90 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, very fine to fine, dark yellowish orange (10*YR* 6/6) grading down to very pale orange (10*YR* 8/2)	0–1
Sand, very fine, silty, clayey, micaceous, dark yellowish orange (10*YR* 6/6) with very pale orange (10*YR* 8/2) mottles	1–5
Sand, medium, poorly sorted, granular, orange (5*YR* 6/7)	5–6
Sand, medium to coarse; subrounded to rounded quartz pebbles up to 4 cm in diameter abundant; very pale orange (10*YR* 8/2)	6–10
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), finely micaceous; very fine sand lenses or filled burrows scattered throughout; yellowish gray (5*Y* 7/2) blotched orange (5*YR* 6/7) grading at 13 feet to bluish gray (5*B* 5/1)	10–34
Sand, fine, silty, clayey, shelly (*Chesapecten* and other mollusks), dark greenish gray (5*G* 4/1)	34–42
Sand, fine to medium, silty; contains quartz pebbles up to 3 cm in diameter; dark greenish gray (5*G* 4/1)	42–43
Eastover Formation	
Sand, fine, well-sorted, very sparsely shelly, dark greenish gray (5*GY* 4/1)	43–46

Base of Windsor Formation: **+80 feet above sea level**
Base of Yorktown Formation (zone 2): **+47 feet above sea level**

Bottomed in Eastover Formation

Courtland Quadrangle

CO–1: At southwestern end of Va. State Road 674 on eastern bank of Nottoway River, in central 1/9th of map area (latitude 36.6746° N., longitude 77.0427° W.). Surface elevation 5 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, very fine to fine with silt and scattered rounded grains of medium to coarse sand; dark yellowish orange (10*YR* 6/6)	0–6
Sand, very fine to very coarse, very poorly sorted; contains scattered very fine dark heavy minerals and subangular to subrounded quartz pebbles up to 3 cm in diameter; yellowish brown (10*YR* 6/4) grading at 14 feet to medium dark gray (*N* 4)	6–18
Silt, very clayey, plastic, sandy (very fine to fine), medium bluish gray (5*B* 5/1)	18–21
Sand, fine to medium; contains scattered fine grains of dark heavy minerals and scattered subrounded to rounded quartz pebbles up to 1 cm in diameter; medium greenish gray (5*G* 5/1)	21–25
St. Marys Formation	
Sand, very fine, grading down to very fine to fine, micaceous, phosphatic sand; much denser than units above; rare clayey lenses present; dark bluish gray (5*B* 3/1) grading down to greenish black (5*G* 2/1)	25–30
Sand, very fine to medium, shelly, sparsely woody; fine phosphate sand abundant; contains rounded phosphate pebbles up to 3 cm in diameter, quartz pebbles up to 1 cm in diameter, and a shark's tooth; greenish black (5*G* 2/1)	30–32
Aquia Formation	
Sand, very fine to fine, silty, phosphatic and glauconitic, greenish black (5*G* 2/1)	32–42
Sand, fine to coarse; contains rounded quartz pebbles up to 2 cm in diameter and mud balls; greenish black (5*G* 2/1)	42–45

Cape Fear Formation

Sand, medium to very coarse, garnetiferous; sparse quartz pebbles up to 1.5 cm in diameter present; contains medium greenish gray (5*GY* 5/1) clay balls up to 2.5 cm in diameter; dark greenish gray (5*GY* 4/1) grading down to light gray (*N* 7) by 52 feet 45–56

Base of alluvium: **-20 feet below sea level**
Base of St. Marys Formation: **-27 feet below sea level**
Base of Aquia Formation: **-40 feet below sea level**

Bottomed in Cape Fear Formation

CO–2: At entrance to dirt road on southwestern side of Va. State Road 651, 0.15 mile northwest of crossing over Norfolk and Western Railroad, in northwestern 1/9th of map area (latitude 36.7173° N., longitude 77.0879° W.). Surface elevation 17 feet.

LITHOLOGY	DEPTH IN FEET
Fill	
Sand, very fine to very coarse and granular, very poorly sorted, grayish orange (10*YR* 6/4) grading down to yellowish brown (10*YR* 5/2)	0–3
Tabb Formation	
Sand, very fine to coarse, poorly sorted, silty, medium olive gray (5*Y* 4/2)	3–4
Sand, medium to coarse, clean, medium yellowish gray (5*Y* 6/2) grading down to pale olive (10*Y* 6/2)	4–6
Sand, medium to very coarse, subangular to subrounded; subangular to rounded quartz granules and pebbles up to 0.5 cm in diameter abundant; pale olive (10*Y* 6/2); lower contact gradational	6–13
Sand, medium to coarse, silty, greenish gray (5*GY* 6/1); lower contact gradational	13–19
Sand, medium to very coarse; contains granules and pebbles of quartz up to 0.5 cm in diameter; light olive brown (10*Y* 5/4)	19–20
Eastover Formation	
Sand, very fine to fine, silty, coarsely micaceous, dark greenish gray (5G 4/1)	20–25
Sand, very fine, clayey, silty, micaceous; basal foot contains subangular to subrounded quartz pebbles up to 5 cm in diameter; dark greenish gray (5*G* 4/1)	25–29
St. Marys Formation	
Sand, very fine to medium, poorly sorted, in very silty and clayey matrix; intensely burrowed; dark greenish gray (5*GY* 4/1)	29–30

Silt, very clayey, sandy (very fine), stiff, dense,
grayish green (10*GY* 5/2); very fine to fine sand
laminae present below 34 feet..... 30–38

Sand, very fine, clayey, silty, medium gray (*N* 4);
phosphate granules abundant at base 38–41

Clubhouse Formation

Silt, very clayey, sandy (very fine), stiff, dense; contains abundant fine
mica; dusky yellowish orange (10*YR* 5/6); lower contact gradational 41–47

Sand, very fine, silty, clayey, finely micaceous, medium olive gray (5*Y* 4/2)
grading by 50 feet to moderate brown (5*YR* 4/4)..... 47–53

Sand, very fine, very micaceous, silty, medium greenish gray (5*GY* 5/1)
interbedded with moderate brown (5*YR* 4/4)..... 53–56

Base of Tabb Formation: **-3 feet below sea level**
Base of Eastover Formation: **-12 feet below sea level**
Base of St. Marys Formation: **-24 feet below sea level**

Bottomed in Clubhouse Formation

Drewryville Quadrangle

DV–1: In Three Creek valley on southwestern side of Va. State Road 659, 0.7 mile north-northwest of Drewryville and 0.15 mile northwest of 54-foot spot elevation, in north-central 1/9th of map area (latitude 36.7250° N., longitude 77.3114° W.). Surface elevation 57 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, fine, well-sorted, clean, grayish orange (10*YR* 7/4)	0–1
Sand, medium to coarse, poorly sorted, angular to subrounded, yellowish orange (10*YR* 7/6) grading down to pale yellowish brown (10*YR* 6/4); lower contact gradational	1–6
Sand, coarse to very course; subangular to subrounded quartz granules abundant; pale grayish orange (10*YR* 6/4) grading down through pale yellowish brown (10*YR* 7/2) back to pale grayish orange (10*YR* 6/4); lower contact somewhat gradational	6–11
Sand, fine to medium, moderately well sorted, slightly clayey and silty; scattered wood fragments present; dusky brown (5*YR* 2/2) grading down through pale orange (10*YR* 7/2) to moderate olive gray (10*Y* 5/1); lower contact gradational	11–16
Sand, medium to coarse, slightly silty, loose, yellowish brown (10*YR* 5/1)	16–23
Eastover Formation	
Sand, fine, well-sorted, silty, medium olive gray (5*Y* 4/2)	23–41
Gravel containing rounded quartz pebbles and discoids up to 3 cm in diameter; matrix dominantly fine sand but with minor medium and coarse fractions, silty, medium olive gray (5*Y* 4/2)	41–44
Patuxent Formation	
Sand, fine to coarse, poorly sorted; kaolin silt matrix abundant; sparsely micaceous; contains scattered subrounded polished quartz pebbles up to 4 cm in diameter; light olive gray (5*Y* 6/1)	44–46

Base of alluvium: **+34 feet above sea level**
Base of Eastover Formation: **+13 feet above sea level**

Bottomed in Patuxent Formation

Emporia Quadrangle

EM–1: On northwestern side of Va. State Road 627, 0.45 mile southwest of Round Hill Cemetery, in southwestern 1/9th of map area (latitude 36.6490° N., longitude 77.6027° W.). Surface elevation 165 feet.

LITHOLOGY	DEPTH IN FEET
Artificial fill	0–1
Yorktown Formation (zone 3)	
Sand, fine to medium; very fine dark heavy minerals abundant; rounded pebbles present in basal 2 feet; pale yellowish brown (10*YR* 6/2) grading down through dark yellowish orange (10*YR* 6/6) with light gray (*N* 7) mottles (2–6 feet) to yellowish gray (5*Y* 7/2)	1–10
Felsic Carolina slate belt rocks	
Saprolite, clay, micaceous; no quartz; light brown (5*YR* 5/6) grading rapidly to reddish brown (10*R* 4/6)	10–16
Saprolite, texture as above; smooth drilling to 42 feet and then stiffened considerably; dark yellowish brown (10*YR* 4/2)	16–46

Base of Yorktown Formation (zone 3): **+155 feet above sea level**

Bottomed in saprolite from felsic Carolina slate belt rocks

EM–2: On dirt road, 200 feet south of Va. State Road 639, 0.45 mile west-southwest of intersection of Va. State Road 639 and Va. State Road 650, in southwestern 1/9th of map area (latitude 36.6313° N., longitude 77.5999° W.). Surface elevation 180 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, very fine to very coarse, clayey, silty; contains rounded quartz pebbles up to 2.5 cm in diameter; quartz discoids up to 2 cm in maximum length on basal contact; light olive gray (5*Y* 6/2) grading down through grayish yellow (5*Y* 8/4) intermingled with light gray (*N 7*) (1–11 feet) and through very light gray (*N* 8) (11–12 feet) to pale yellowish gray (5*Y* 9/1)	1–17
Yorktown Formation (zone 3)	
Silt, very clayey, sandy (very fine), light gray (*N* 7), 3-inch-thick layer	at 17
Sand, very fine to fine; contains abundant very fine dark heavy minerals; minor fraction of rounded medium to coarse grains present; dark yellowish orange (10*YR* 6/6)	17–26
Sand, fine to medium; contains rounded quartz pebbles up to 2.5 cm in diameter; sparsely micaceous, dark yellowish orange (10*YR* 6/6)	26–28
Granite	
Saprolite from granite, clay, plinthitic; contains angular quartz sand; dark yellowish orange (10*YR* 6/6) grading down to yellowish gray (5*Y* 7/3)	28–31

Base of Chowan River Formation: **+163 feet above sea level**
Base of Yorktown Formation (zone 3): **+152 feet above sea level**

Bottomed in saprolite from granite

EM–3: On dirt road, 400 feet north of Va. State Road 639, 0.7 mile west-southwest of intersection of Va. State Road 639 and Va. State Road 650, in southwestern 1/9th of map area (latitude 36.6302° N., longitude 77.6063° W.). Surface elevation 200 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, very fine to very coarse, clayey, silty; contains scattered subrounded to rounded quartz pebbles up to 3 cm in diameter; light gray (*N 7*) grading down to very light gray (*N* 8) with moderate red (5*R* 4/6) mottles	1–6
Sand, medium to coarse, clayey, silty, very light gray (*N* 8)	6–15
Yorktown Formation (zone 3)	
Silt, very clayey, sandy (very fine), light gray (*N* 7), 3 inches thick	at 15
Sand, very fine to fine with bimodal coarse fraction, pale yellowish orange (10*YR* 8/6)	15–26
Metamorphosed granite	
Saprolite from granite, predominantly composed of quartzose, silty clay; denser than units above; light olive gray (5*Y* 6/1) grading down to moderate olive brown (5*Y* 5/4)	26–33

Base of Chowan River Formation: **+185 feet above sea level**
Base of Yorktown Formation (zone 3): **+174 feet above sea level**

Bottomed in saprolite from metamorphosed granite

EM–4: On dirt road (not shown), 0.4 mile west of intersection of Va. State Road 639 and Va. State Road 650, in southwestern 1/9th of map area (latitude 36.6336° N., longitude 77.6024° W.). Surface elevation 185 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, fine to coarse; scattered very fine to fine dark heavy mineral grains present; pinkish gray (5*YR* 8/1)	0–4
Silt, very clayey, sandy (very fine), pinkish gray (5*YR* 8/1), about 2 inches thick	at 4
Sand, very fine to fine, clayey, light gray (*N* 7) (4–6 feet) grading down to yellowish gray (5*Y* 8/1) with moderate yellowish orange (10*YR* 6/6) mottles	4–19
Sand, very fine to very coarse, very poorly sorted; coarse to very coarse grains rounded; contains rounded quartz pebbles up to 2 cm in diameter; yellowish gray (5*Y* 8/1)	19–21
Sand, modally coarse to very coarse, poorly sorted; light and dark rounded quartz pebbles up to 2 cm in diameter increasingly abundant downward and very abundant in basal 6 inches; light greenish gray (5*GY* 8/1)	21–29
Yorktown Formation (zone 3)	
Sand, very fine; silty and clayey in lenses; abundant mica; dusky yellow (5*Y* 6/4) intermingled with light brown (5*YR* 5/6)	29–33
Gravel containing dark and light rounded quartz pebbles up to 3 cm in diameter; very fine to very coarse sand matrix, dusky yellow (5*Y* 6/4) intermingled with light brown (5*YR* 5/6)	33–34
Yorktown Formation (zone 2)	
Sand, very fine to fine; contains fluted echinoid spines, shell fragments, and irregular lumps of cemented material up to 3–4 cm in length; yellowish gray (5*Y* 7/2)	34–36
Gravel containing rounded quartz pebbles up to 4 cm in diameter; very fine to fine sand matrix, yellowish gray (5*Y* 7/2)	36–38

Granite

Saprolite from granite, predominantly composed of very micaceous, sandy (medium to coarse) silty clay; orange (5*YR* 5/8) grading down in basal few inches to dark gray (*N* 3) and pale green (10*G* 6/2); very dense and tough; refusal at base..... 38–45

Base of Chowan River Formation: **+156 feet above sea level**
Base of Yorktown Formation (zone 3): **+151 feet above sea level**
Base of Yorktown Formation (zone 2): **+147 feet above sea level**

Bottomed in saprolite from granite

EM–5: On eastern side of Va. State Road 658, 0.55 mile south of intersection of Va. State Road 658 and Va. State Road 611, in west-central 1/9th of map area (latitude 36.6797° N., longitude 77.6044° W.). Surface elevation 205 feet.

LITHOLOGY DEPTH IN FEET

Felsic Carolina slate belt rocks

Clay, silty, sandy (fine to medium), reddish brown (10*R* 4/6) grading down through pale yellowish orange (10*YR* 8/6) to very light gray (*N* 8)..... 0–6

Saprolite, clay, silty, sandy (fine to medium); numerous platy crystals present; swirled schistose banding visible; colors range from moderate red (5*R* 5/6) to pale yellowish orange (10*YR* 8/6)..... 6–16

Bottomed in saprolite from felsic Carolina slate belt rocks

EM–6: On northern side of unnumbered dirt road, 100 feet west of power line, 1.0 mile south-southeast of intersection of Va. State Road 658 and Va. State Road 611, in west-central 1/9th of map area (latitude 36.6734° N., longitude 77.6013° W.). Surface elevation 222 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, dominantly very fine to fine but with a minor medium to coarse fraction, yellowish gray (5*Y* 7/2)	0–2
Sand, dominantly very fine to fine but with a minor medium to coarse fraction, clayey; contains rounded plinthite lumps up to 1 cm in length; dark very fine to fine heavy mineral grains present below 6 feet; light brown (5*YR* 5/6)	2–11
Sand, dominantly very fine to fine but with a minor medium to coarse fraction, clayey; contains dark very fine to fine heavy mineral grains and scattered subrounded to rounded quartz pebbles up to 1 cm in diameter; yellowish gray (5*Y* 7/3)	11–19
Sand, medium to coarse; rounded quartz pebbles up to 2.5 cm in diameter abundant; yellowish gray (5*Y* 7/3)	19–20
Felsic Carolina slate belt rocks	
Saprolite, clay, silty, sandy (fine), very pale yellowish gray (5*Y* 9/1)	20–21
Saprolite, clay, silty, moderate reddish orange (10*R* 6/6) grading down to moderate red (5*R* 5/4)	21–41

Base of Chowan River Formation: **+202 feet above sea level**

Bottomed in saprolite from felsic Carolina slate belt rocks

EM–7: On eastern side of unnumbered dirt road, 0.25 mile north of Va. State Road 611, 0.9 mile east-northeast of intersection of Va. State Road 658 and Va. State Road 611, in west-central 1/9th of map area (latitude 36.6917° N., longitude 77.5897° W.). Surface elevation 215 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, very fine to very coarse; contains subrounded to rounded quartz pebbles up to 2 cm in diameter; reddish brown (10*R* 5/7) grading down by 4 feet to reddish orange (10*R* 6/6); lower contact gradational	0–16
Gravel containing rounded quartz pebbles up to 4 cm in diameter, largest at base, reddish orange (10*R* 6/6)	16–23
Felsic Carolina slate belt rocks	
Saprolite, clay, silty; very fine to fine angular sand present; moderate reddish orange (10*R* 6/6) with thin bands of very light gray (*N* 8) in basal 3 feet	23–36

Base of Chowan River Formation: +192 feet above sea level

Bottomed in saprolite from felsic Carolina slate belt rocks

EM–8: Along dirt road running north-northwest from Va. State Road 619, 0.4 mile south of northern quadrangle border, in north-central 1/9th of map area (latitude 36.7445° N., longitude 77.5552° W.). Surface elevation 158 feet.

LITHOLOGY	DEPTH IN FEET
Fill	
Road gravel	0–1
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine, silty, slightly clayey, yellowish gray (5*Y* 6/2) grading down to light grayish brown (5*YR* 4/2)	1–6
Sand, very fine to fine, angular, with scattered medium to very coarse, subangular grains; silty, clayey, medium light gray (*N* 6) grading down through pale olive (10*Y* 6/2) to light gray (*N* 7); lower contact somewhat gradational	6–10
Sand, fine to medium, slightly silty, dusky yellow (5*Y* 6/6) grading down to pale grayish orange (10*YR* 8/4)	10–11
Silt, clayey, sandy (very fine), stiff and dense, pale grayish orange (10*YR* 8/4)	11–14
Sand, fine to coarse, subangular, silty, slightly clayey, yellowish gray (5*Y* 8/1)	14–17
Silt, dense, clayey, dark grayish yellow (5*Y* 7/4)	17–17.5
Gravel containing rounded quartz clasts up to 1 cm in diameter; dark grayish yellow (5*Y* 7/4)	17.5–18
Sand, very fine to coarse, very poorly sorted, angular to subangular, clayey, silty, dusky yellow (5*Y* 6/4) grading down through dark yellowish orange (10*YR* 6/6) to dusky yellow (10*Y* 6/6)	18–21
Gravel containing rounded to discoidal quartz clasts up to 3 cm in diameter, in clayey and silty, very fine to medium sand matrix; dark grayish yellow (5*Y* 7/4)	21–22
Gravel; no recovery; very tough drilling	22–33

Felsic Carolina slate belt rocks

Impenetrable bed; drill bit recovered wisps of banded saprolite with angular quartz; pale brown (5*YR* 5/2) 33–33.5

Base of lower Bacons Castle Formation: +125 feet above sea level

Bottomed on felsic Carolina slate belt rocks

Jarratt Quadrangle

JA–93–1: On northern side of Va. State Route 610, 0.35 mile east-northeast of intersection with Va. State Route 608 and on western bank of Hickory Swamp, in west-central 1/9th of map area (latitude 36.8137° N., longitude 77.4862° W.). Surface elevation 141 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine to fine, clayey, dark yellowish orange (10*YR* 6/6)	0–1
Sand, fine to medium with scattered rounded coarse to very coarse grains, yellowish gray (5*Y* 7/2)	1–6
Sand, dominantly coarse to very coarse but with minor fine to medium fraction; subangular to subrounded quartz pebbles up to 2 cm in diameter present below 9 feet; very light pinkish gray (5*YR* 9/1)	6–14
Silt, very clayey, sandy (very fine), light olive gray (5*Y* 6/1) (14–15 feet) grading down to medium gray (*N* 5)	14–21
Sand, medium to very coarse; contains quartz pebbles up to 1 cm in diameter; moderate yellowish brown (10*YR* 5/4)	21–24
Chowan River Formation	
Silt, very clayey, dark yellowish orange (10*YR* 6/6); lower contact somewhat gradational	24–25
Silt, very clayey, sandy (very fine to fine), micaceous; contains thin lenses of very fine sand, tough, dense with greasy, dense lumps; bluish gray (5*B* 5/1)	25–37
Sand, very fine with scattered medium to coarse grains; sparse quartz pebbles at base up to 2 cm in diameter; olive gray (5*Y* 3/1)	37–38
Yorktown Formation (zone 2)	
Silt, very clayey, shelly (mostly *Mulinia*, some *Turritella*, and oysters) below 51 feet, dark greenish gray (5*GY* 4/1)	38–61

Base of lower Bacons Castle Formation: **+117 feet above sea level**
Base of Chowan River Formation: **+103 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

JA–93–2: On western side of Va. State Route 609, 0.55 mile east of western quadrangle border and 0.3 mile north of southern quadrangle border, in southwestern 1/9th of map area (latitude 36.7542° N., longitude 77.4903° W.). Surface elevation 110 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, very fine to very coarse, clayey and silty, reddish brown (10*R* 4/6) to dusky yellow (5*Y* 6/4)	0–1
Silt, very clayey, sandy (very fine to medium), yellowish gray (5*Y* 8/1), dusky yellow (5*Y* 6/4), and light yellowish orange (10*YR* 6/8); scattered kaolinitized medium to coarse grains of potassium feldspar present	1–9
Sand, very fine to very coarse, silty and clayey; contains quartz pebbles up to 1 cm in diameter; dark yellowish orange (10*YR* 6/6)	9–10
Yorktown Formation (zone 2)	
Silt, very clayey, light olive gray (5*Y* 7/1) grading down through light brown (5*YR* 5/6); lower contact gradational	10–11
Silt, clayey, shelly below uppermost foot (oyster, *Turritella*, and annelid tubes), bluish gray (5*B* 4/1)	11–22
Gravel containing quartz pebbles in matrix of sandy and clayey silt; bluish gray (5*B* 4/1)	22–23
Felsic Carolina slate belt rocks	
Metabasalt(?); angular fragments recovered; dark gray (*N* 2); some slight recovery and then refusal	at 23

Base of Chowan River Formation: **+100 feet above sea level**
Base of Yorktown Formation (zone 2): **+87 feet above sea level**

Bottomed in felsic Carolina slate belt rocks

JA–93–3: Along dirt road, 0.05 mile southeast of Nottoway River and 0.1 mile south of northern quadrangle border, in north-central 1/9th of map area (latitude 36.8740° N., longitude 77.4430° W.). Surface elevation 85 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium on Patuxent Formation	
Hole not logged in detail; bottomed in dense sand	0–35

Bottomed in Patuxent Formation

JA–93–4: At T-intersection of dirt roads at 89-foot spot elevation point, 0.2 mile east of Nottoway River and 0.55 mile south of northern quadrangle border, in north-central 1/9th of map area (latitude 36.8667° N., longitude 77.4565° W.). Surface elevation 89 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, gravelly at base; not logged in detail	0–24
Felsic Carolina slate belt rocks	
Saprolite, clay containing angular black grains of quartz; not logged in detail	24–35

Base of alluvium: **+65 feet above sea level**

Bottomed in saprolite from felsic Carolina slate belt rocks

JA–93–5: Along dirt road, 0.45 mile southeast of 89-foot spot elevation point, and 0.8 mile south of northern quadrangle border, in north-central 1/9th of map area (latitude 36.8632° N., longitude 77.4516° W.). Surface elevation 91 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium on Patuxent Formation	
Hole not logged in detail; bottomed in dense sand containing quartz pebbles, clay balls, and, garnetiferous sand	0–30

Bottomed in Patuxent Formation

JA–93–6: On southern side of Va. State Route 631, 0.05 mile west of bridge over Poplar Swamp and 0.85 mile south-southwest of Henry, in southeastern 1/9th of map area (latitude 36.7916° N., longitude 77.4075° W.). Surface elevation about 95 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, fine but with minor fraction of medium and coarse, silty, clayey, dark yellowish orange (10*YR* 6/6) with yellowish brown (10*YR* 5/2) mottles	0–1
Sand, fine, grading down through medium to dominantly coarse sand; contains quartz pebbles up to 1 cm in diameter; dark yellowish orange (10*YR* 6/6) with grayish orange (10*YR* 7/4) mottles	1–6
Yorktown Formation (zone 2)	
Sand, fine, silty, interbedded with clayey silt; yellowish orange (10*YR* 7/6) with yellowish gray (5*Y* 7/2) mottles grading down to medium greenish gray (5*G* 5/1)	6–11
Silt, clayey, medium greenish gray (5*G* 5/1)	11–30
Silt, clayey, sandy (very fine to fine), medium greenish gray (5*G* 5/1)	30–39
Sand, dominantly fine but with abundant medium and coarse, clayey, silty; rotten shells present; quartz pebbles up to 2 cm in diameter present in basal foot; greenish gray (5*GY* 5/1)	39–43
Eastover Formation	
Sand, mostly fine and well-sorted; sparse medium to coarse grains present; slightly silty and clayey; moderate olive gray (5*Y* 4/2) grading down to moderate olive gray (5*Y* 5/1)	43–51
Gravel containing quartz pebbles up to 7 cm in diameter; matrix fine and well sorted sand, slightly silty and clayey; moderate olive gray (5*Y* 5/1)	51–59
Patuxent Formation	
Sand, fine, silty, pale olive gray (5*Y* 7/1) grading rapidly down to light olive gray (5*Y* 6/1), granular, medium to coarse sand	59–65
Silt, very clayey, micaceous, dense, sticky, dark olive gray (5*Y* 3/1)	65–66

Base of alluvium:	**+89 feet above sea level**
Base of Yorktown Formation (zone 2):	**+52 feet above sea level**
Base of Eastover Formation:	**+36 feet above sea level**

Bottomed in Patuxent Formation

JA–06–7: 0.25 mile northwest of U.S. Route 301 on northeastern side of dirt road on eastern side of Seaboard Railroad line, 0.48 mile north-northeast of 150-foot spot elevation on railroad, in north-central 1/9th of map area (latitude 36.8469° N., longitude 77.4416° W.). Surface elevation 136 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine, slightly silty, grayish orange (10*YR* 7/4) grading down to dark yellowish orange (10*YR* 6/6)	0–1
Sand, very fine to fine, silty, slightly clayey, dense, bright orange (10*YR* 6/8)	1–6
Sand, very fine to fine, silty, clayey, dark grayish orange (10*YR* 6/4)	6–11
Sand, dominantly very fine to fine but ranging up to coarse, silty, slightly clayey; contains scattered subangular to subrounded granules; dark grayish orange (10*YR* 6/4)	11–14
Silt, clayey, sandy (very fine), moderate reddish brown (10*R* 4/6) intermingled with grayish yellow (5*Y* 8/4)	14–16
Sand, dominantly very fine, silty, slightly clayey; contains scattered subrounded to rounded, fine to coarse grains; dark yellowish orange (10*YR* 6/6)	16–17
Silt, clayey, sandy (very fine), yellowish gray (5*Y* 7/2)	17–17.5
Sand, dominantly very fine, silty and slightly clayey; contains scattered subrounded to rounded, fine to coarse grains; dark yellowish orange (10*YR* 6/6)	17.5–19
Sand, very fine to medium, poorly sorted, silty, soft, dark yellowish orange (10*YR* 6/6); lower contact somewhat gradational	19–24
Chowan River Formation	
Sand, very fine to fine, silty, more compacted than above unit, light orange (10*YR* 7/8)	24–29
Sand, fine, well-sorted, silty, thixotropic, dark greenish gray (5*G* 4/1)	29–31

Sand, fine, well-sorted, silty; contains fine to medium mica;
light olive gray (10Y 5/2); lower contact gradational 31–44

Sand, dominantly fine but very fine to medium; contains
rounded to discoidal quartz pebbles up to 0.5 cm in diameter
in basal foot; medium dark gray (*N* 4) 44–47

Yorktown Formation (zone 2)

Silt, clayey, sandy (very fine), medium greenish gray (5*G* 5/1) 47–61

Base of lower Bacons Castle Formation: +112 feet above sea level
Base of Chowan River Formation: +91 feet above sea level

Bottomed in Yorktown Formation (zone 2)

Littleton Quadrangle

LI–93–1: On southeastern side of Va. State Route 634, 0.4 mile southwest of intersection of Va. State Route 634 and Va. State Route 622, in south-central 1/9th of map area (latitude 36.9057° N., longitude 77.1891° W.). Surface elevation 42 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, medium to very coarse, slightly feldspathic, poorly sorted; contains angular to mostly rounded quartz pebbles up to 2 cm in diameter; brownish gray (5*YR* 4/1) grading down through grayish orange (10*YR* 6/4) (1–2 feet) to pale yellowish orange (10*YR* 9/6)	0–14
Sand, fine to coarse, modally medium, grading down to very fine to medium but modally fine sand; contains scattered very fine to fine grains of dark heavy minerals; silty, yellowish gray (5*Y* 9/1)	14–19
Sand, medium to very coarse; contains subrounded to rounded quartz pebbles up to 4 cm in diameter; yellowish gray (5*Y* 9/1) with orange (5*YR* 5/8) mottles in basal 6 inches	19–24
Patuxent Formation	
Silt, very clayey, sandy (fine), stiff, dense, orange (5*YR* 5/8) grading down to dark greenish gray (5*GY* 4/1)	24–24.5
Sand, very fine to fine, silty, very micaceous with flakes up to 1 mm in diameter, greenish gray (5*GY* 6/1) grading down to greenish gray (5*G* 5/1)	24.5–30
Sand, fine to coarse, modally medium, garnetiferous, sparsely micaceous; contains dense waxy mud lumps up to 1 cm in diameter; light bluish gray (5*B* 7/1)	30–31

Base of alluvium: **+18 feet above sea level**

Bottomed in Patuxent Formation

LI–93–2: On northwestern side of Va. State Route 622, 0.17 mile west of eastern quadrangle border, in southeastern 1/9th of map area (latitude 36.9057° N., longitude 77.1276° W.). Surface elevation 48 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, fine, well-sorted; contains very fine grains of dark heavy minerals; grayish orange (10*YR* 7/4) (0–1 foot) grading down through very pale orange (10*YR* 6/4) (1–2 feet) to pale yellowish orange (10*YR* 8/2)	0–6
Sand, fine to very coarse, modally medium, grading down to medium to very coarse sand, modally coarse; pale orange (10*YR* 7/2)	6–10
Sand, medium to very coarse; contains subrounded to rounded quartz pebbles up to 3.5 cm in diameter; pale orange (10*YR* 7/2)	10–11
Yorktown Formation (zone 1)	
Sand, dominantly fine but ranging up to coarse, very shelly (including barnacles, *Chesapecten*, *Pleuromeris*, and other mollusks); contains calcite-cemented lumps; light olive gray (5*Y* 6/1)	11–13
Eastover Formation	
Sand, very fine to medium, modally fine, grading down to modally medium, silty sand; contains scattered grains of phosphate sand and chalky shells (including *Chesapecten*); dark greenish gray (5*G* 5/1)	13–28
St. Marys Formation	
Silt, very clayey; contains sparse grains of dense, sticky, very fine sand; contains burrows in upper foot filled with sand from unit above; dark greenish gray (5*G* 5/1); lower contact somewhat gradational	28–56
Sand, very fine, silty, clayey, dark greenish gray (5*GY* 5/1)	56–60
Sand, very fine to medium, modally fine; contains scattered grains of coarse to granule-size quartz and phosphate pebbles up to 0.5 cm in diameter; dark greenish gray (5*G* 4/1)	60–62
Aquia Formation	
Sand, quartz-phosphate, silty, glauconitic; quartz fraction angular to subangular, very fine to fine; phosphate fraction rounded, fine to medium; olive black (5*Y* 2/1)	62–70

Sand, very fine to very coarse; contains scattered quartz pebbles up to 0.5 cm in diameter reworked from bed below; olive black (5*Y* 2/1) 70–71

Patuxent Formation

Sand, fine to very coarse, modally medium to coarse, micaceous; contains small subrounded to rounded quartz pebbles up to 1 cm in diameter; some pebbles partially polished; greenish gray (5*G* 6/1) grading down to greenish gray (5*G* 7/1) 71–76

Base of alluvium:	**+37 feet above sea level**
Base of Yorktown Formation (zone 1):	**+35 feet above sea level**
Base of Eastover Formation:	**+20 feet above sea level**
Base of St. Marys Formation:	**-14 feet below sea level**
Base of Aquia Formation:	**-23 feet below sea level**

Bottomed in Patuxent Formation

LI–93–3: Between Va. State Route 35 and Va. State Route 631, 0.05 mile south-southwest of their intersection at Barretts Store, in southeastern 1/9th of map area (latitude 36.8849° N., longitude 77.1551° W.). Surface elevation 123 feet.

LITHOLOGY DEPTH IN FEET

Upper Bacons Castle Formation (Bahramsville Member)

Sand, fine to coarse, modally medium, grayish orange (10*YR* 8/4) grading down to dark yellowish orange (10*YR* 6/6) 0–5

Sand, fine to coarse, modally medium, clayey, light brown (5*YR* 5/7) with very pale orange (10*YR* 8/2) mottles..... 5–9

Sand, medium to coarse, grading down to slightly clayey, fine to medium sand; moderate reddish orange (10*R* 6/6) grading down to dark yellowish orange (10*YR* 7/6); plinthite lumps up to 2 cm in diameter present at base 9–14

Silt, very clayey, stiff, dense, becoming very fine sandy downward; moderate yellowish brown (10*YR* 5/4) grading down to moderate orange pink (5*YR* 8/4) 14–19

Sand, very fine to medium, modally fine, moderate orange pink (10*R* 7/4)..... 19–20

Silt, very clayey, sandy (very fine), moderate orange pink (10*R* 7/4) with light red (5*R* 6/6) and grayish orangish pink (5*YR* 7/2) mottles 20–25

Sand, very fine to fine, silty, clayey, grading down to medium to coarse sand with scattered quartz granules near base; moderate orange pink (10*R* 7/4) with streaks of dark yellowish orange (10*YR* 6/6) grading down to pale yellowish orange (10*YR* 8/6) near base..... 25–30

Silt, very clayey, sandy (very fine to medium), stiff, dense, moderate orangish pink (10*R* 7/4) 30–31

Chowan River Formation

Sand, medium to coarse, grading down to fine to medium sand; clay-rich lense present at 37 feet; grayish orange (10*YR* 7/4) 31–38

Yorktown Formation (zone 2)

Silt, clayey, sandy (very fine), sparsely micaceous, dark yellowish orange (10*YR* 6/6) (38–39 feet) grading down rapidly to medium bluish gray (5*B* 5/1) 38–46

Silt, very clayey, sandy (very fine), dense, sparsely micaceous; hard greasy clay lumps scattered throughout; dark greenish gray (5*G* 4/1) 46–48

Silt, clayey, sandy (very fine), sparsely micaceous, shelly (mostly *Mulinia*), dark greenish gray (5*G* 5/1) grading down to dark bluish greenish gray (5*BG* 5/1) 48–64

Silt, sandy (very fine), sparsely micaceous, more shelly than above unit and fauna more diverse (*Pleuromeris*, oyster, and other mollusks); contains reworked lumps of underlying sand; dark bluish greenish gray (5*BG* 5/1) 64–69

Yorktown Formation (zone 1)

Sand, fine to coarse; contains abundant calcite-cemented lumps up to 8 cm in length; medium bluish gray (5*B* 6/1) 69–81

Base of upper Bacons Castle Formation: **+92 feet above sea level**
Base of Chowan River Formation: **+85 feet above sea level**
Base of Yorktown Formation (zone 2): **+54 feet above sea level**

Bottomed in Yorktown Formation (zone 1)

LI–93–4: On eastern side of Va. State Route 634, 0.08 mile north of bridge over main channel of Assamoosick Swamp, in northeastern 1/9th of map area (latitude 36.9729° N., longitude 77.1510° W.). Surface elevation 65 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, fine, well-sorted, yellowish gray (5*Y* 7/1)	0–1
Silt, very clayey, sandy (very fine), dense, stiff, dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) mottles	1–2
Sand, dominantly fine but up to medium, well-sorted; contains scattered grains of dark heavy minerals and scattered rounded quartz pebbles up to 0.5 cm in diameter; light pinkish gray (5*YR* 9/1)	2–6
Sand, fine to medium, grading down to fine to coarse sand near base; contains scattered grains of dark heavy minerals and scattered rounded quartz pebbles up to 0.5 cm in diameter; yellowish gray (5*Y* 8/1)	6–11
Yorktown Formation (zone 1)	
Sand, very fine to fine; contains fine to medium grains of phosphate and abundant calcite-cemented lumps of sediment; very shelly in basal foot (*Chesapecten*, *Pleuromeris*, *Mercenaria*, and oyster among other shells); yellowish gray (5*Y* 7/2)	11–26
Eastover Formation	
Sand, very fine to fine, silty (26–28 feet), but clean and well-sorted below that interval; chalky aragonitic shells present at 31 feet and a *Chesapecten* shell present at 34 feet; dark greenish gray (5*G* 4/1)	26–42
Sand, very fine, clayey, silty, slightly micaceous, medium bluish greenish gray (5*BG* 5/1)	42–44
Sand, fine, well-sorted, sparsely shelly, grading down to fine to medium sand in basal foot; dark greenish gray (5*G* 4/1)	44–53
St. Marys Formation	
Silt, very clayey, sticky, dense, micaceous; thin layer of chalky *Turritella* shells present at 62 feet; greenish gray (5*G* 5/1); becomes more sandy downward; lower contact gradational	53–72

Sand, very fine to medium; scattered quartz granules and chalky shells present throughout; subangular to subrounded quartz pebbles up to 1.5 cm in diameter abundant in basal foot; medium bluish greenish gray (5*BG* 5/1) 72–80

Aquia Formation

Sand, dominantly fine but with a subordinate medium to coarse rounded quartz fraction, micaceous, shelly, olive black (5*Y* 3/1) 80–83

Gravel containing densely packed subrounded to rounded quartz clasts up to 4.5 cm in diameter; pale yellowish gray (5*Y* 9/1) in olive black (5*Y* 3/1) sand matrix; matrix includes garnets reworked from bed below 83–85.5

Patuxent Formation

Sand, fine to coarse, poorly sorted, coarsely micaceous, garnetiferous, yellowish green (10*GY* 5/3) 85.5–86

Base of alluvium:	**+54 feet above sea level**
Base of Yorktown Formation (zone 1):	**+39 feet above sea level**
Base of Eastover Formation:	**+12 feet above sea level**
Base of St. Marys Formation:	**-15 feet below sea level**
Base of Aquia Formation:	**-21 feet below sea level**

Bottomed in Patuxent Formation

LI–93–5: On western side of Va. State Route 40, 1.1 mile south-southwest of intersection of Va. State Route 40 and Va. State Route 665, in northeastern 1/9th of map area (latitude 36.9840° N., longitude 77.1475° W.). Surface elevation 109 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine, silty, grading down to clayey and silty sand; dark yellowish orange (10*YR* 6/6) with reddish orange (10*R* 5/7) mottles (0–4 feet) grading down to dark yellowish orange (10*YR* 6/6) with reddish orange (10*R* 5/7) and very light gray (*N* 8) mottles	0–7
Silt, very clayey, sandy (very fine), very light gray (*N* 8) with dark yellowish orange (10*YR* 6/6) and reddish orange (10*R* 5/7) mottles	7–11
Sand, very fine to fine; some intervals silty and clayey; orange (5*YR* 5/8) to dark yellowish orange (10*YR* 6/6)	11–15
Sand, fine, clean; dark heavy mineral grains abundant; subrounded quartz pebbles up to 1 cm in diameter present on basal contact; orange (5*YR* 5/8) to dark yellowish orange (10*YR* 6/6)	15–17
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, medium to very coarse; contains scattered grains of dark heavy minerals; moderate orange pink (10*R* 7/4) grading down to light brown (5*YR* 7/4)	17–27
Sand, medium to very coarse; subrounded quartz pebbles up to 1 cm in diameter moderately abundant; light brown (5*YR* 7/4) grading down to dark yellowish orange (10*YR* 6/6) in basal foot	27–31
Yorktown Formation (zone 2)	
Silt, sandy (very fine), clayey, finely micaceous, light brown (5*YR* 6/6) (31–32 feet) grading down through light brown (5*YR* 7/4) (32–33 feet) to medium bluish gray (5*B* 5/1)	31–42
Sand, fine to medium, clayey, silty, shelly (*Pleuromeris*, *Mulinia*, and oysters), medium bluish gray (5*B* 5/1)	42–44
Yorktown Formation (zone 1)	
Sand, quartz-phosphate, silty; very fine to fine quartz fraction; fine to medium phosphate fraction;contains abundant calcite-cemented lumps; medium greenish gray (5*G* 5/1)	44–51

Base of upper Bacons Castle Formation: **+92 feet above sea level**
Base of lower Bacons Castle Formation: **+78 feet above sea level**
Base of Yorktown Formation (zone 2): **+65 feet above sea level**

Bottomed in Yorktown Formation (zone 1)

LI–93–6: On eastern side of Va. State Route 634, 0.23 mile north-northeast of intersection of Va. State Route 634 and Va. State Route 604, in northeastern 1/9th of map area (latitude 36.9597° N., longitude 77.1545° W.). Surface elevation 112 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine, silty grading down to clayey and silty, dense and stiff; dark yellowish orange (10*YR* 6/6) with reddish orange (10*R* 5/7) and very light gray (*N* 8) mottles; reddish orange (10*R* 5/7) mottles decrease in abundance downward	0–11
Sand, very fine to fine, well-sorted; dark heavy mineral grains abundant; dark yellowish orange (10*YR* 6/6) with reddish orange (10*R* 5/7) and very light gray (*N* 8) mottles	11–14
Sand, very fine, clayey, very light gray (*N* 8)	14–15.5
Sand, very fine to medium, dominantly fine, dark heavy mineral grains abundant; contains very light gray (*N* 8) clay balls ranging from coarse sand-size to 2 cm in diameter; moderate reddish orange (10*R* 6/6)	15.5–17
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine to fine), micaceous; top 3 inches moderate brown (10*YR* 4/4) and below that dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) mottles; plinthite lumps present at 18 feet	17–25
Silt, sandy (very fine), clayey, finely micaceous, yellowish gray (5*Y* 7/2) with dark yellowish orange (10*YR* 6/6) mottles	25–36

Base of upper Bacons Castle Formation: **+95 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

LI–93–7: On southern side of dirt road, 0.63 mile east of 116-foot spot elevation along Va. State Route 35, in east-central 1/9th of map area (latitude 36.9329° N., longitude 77.1493° W.). Surface elevation 111 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine, silty, grading down to very fine to fine, clayey and silty, dense and stiff sand; dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) and red (5*R* 5/7) mottles; red mottles made of pseudoplinthite	0–11
Sand, very fine to fine, silty; sparse dark heavy mineral grains present; moderate reddish orange (10*R* 6/6) with streaks of very light gray (*N* 8)	11–16
Sand, very fine, clayey, sticky, dense, dark yellowish orange (10*YR* 6/6) and very light gray (*N* 8); lower contact abrupt	16–17
Yorktown Formation (zone 2)	
Sand, dominantly fine but grains range up to coarse, silty; plinthite lumps up to 2 cm in diameter in upper foot; dark yellowish orange (10*YR* 6/6); probably a paleosol	17–21
Silt, sandy (very fine), clayey, dark yellowish orange (10*YR* 6/6) with streaks of very light gray (*N* 8); lower contact gradational	21–26
Silt, sandy (very fine), clayey, yellowish gray (5*Y* 7/2) with pale yellowish brown (10*YR* 6/2) mottles and streaks of black (*N* 1) (possibly root ghosts); lower contact gradational	26–31
Silt, sandy (very fine), clayey; articulated shells of *Mulinia* abundant; upper foot has subangular to subrounded calcite-cemented lumps up to 1 cm in diameter, at least one of which formed around a barnacle; very fine mica abundant; medium bluish gray (5*B* 5/1)	31–36

Base of upper Bacons Castle Formation: **+94 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

LI–93–8: In triangle on eastern side of Va. State Route 35, at intersection of Va. State Route 35 and Va. State Route 634 , 0.35 mile south-southeast of Homeville, in central 1/9th of map area (latitude 36.9444° N., longitude 77.1682° W.). Surface elevation 124 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, fine, loamy, moderate brown (5*YR* 3/4)	0–1
Sand, very fine to fine, silty, grading down through clayey and silty sand to silty sand; dark yellowish orange (10*YR* 6/6) with very light gray (*N 8*) and red (5*R* 5/7) mottles; pseudoplinthite at 9 feet	1–11
Sand, very fine to fine, variably silty and clayey; dark heavy mineral grains present; light brown (5*YR* 6/4) with streaks of reddish orange (10*R* 6/6) and very light gray (*N* 8)	11–17
Yorktown Formation (zone 2)	
Silt, very clayey, sandy (very fine); contains scattered lenses of clean very fine sand; very fine mica present; yellowish gray (5*Y* 7/2) with streaks of black (*N* 1) carbon(?), grading down to dark yellowish orange (10*YR* 6/6)	17–25
Silt, sandy (very fine), clayey, finely micaceous; articulated and disarticulated *Mulinia* shells present below 31 feet; medium bluish gray (5*B* 5/1)	25–41

Base of upper Bacons Castle Formation: **+107 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

LI–93–9: On northern side of Va. State Route 622, 0.35 mile west-northwest of intersection of Va. State Route 622 and Va. State Route 35 and 0.95 mile northwest of Littleton, in southeastern 1/9th of map area (latitude 36.9095° N., longitude 77.1645° W.). Surface elevation about 65 feet.

LITHOLOGY	DEPTH IN FEET
Colluvium	
Sand, very fine to very coarse, sparsely granular, very silty, yellowish orange (10*YR* 7/6)	0–2
Yorktown Formation (zone 2)	
Silt, sandy (very fine), clayey, finely micaceous, orange (5*YR* 5/7), yellowish orange (5*YR* 6/6), and yellowish gray (5*YR* 8/1) grading down by 5 feet to yellowish orange (5*YR* 8/1) and light gray (*N* 7); moderate brown (5*YR* 3/4) plinthite at base	2–8
Silt, sandy (very fine), clayey, finely micaceous, moderate brown (5*YR*5/4) and dark yellowish orange (10*YR* 6/6) with sparse light gray (*N* 7) mottles	8–12
Sand, fine to medium, but ranging up to coarse, dark yellowish orange (10*YR* 6/6); 3 inches thick	at 12
Yorktown Formation (zone 1)	
Sand, mostly fine but some medium grains present; scattered rounded dark phosphate grains present; silty, dusky yellow (2.5*Y* 5/4)	12–18
Sand, mostly fine but some medium grains present; calcareous; calcite-cemented lumps present; at least one lump contains a barnacle; dusky yellow (2.5*Y* 5/4)	18–23
Eastover Formation	
Sand, mostly fine with scattered medium grains, grading down in basal foot to fine to coarse sand; sparse shells scattered throughout, but locally abundant at 33–34 feet (including *Isognomon*); quartz pebbles at base; greenish gray (5*G* 5/1)	23–39
St. Marys Formation	
Silt, very clayey, stiff, sticky, grading down to silty and clayey, very fine sand; bluish greenish gray (5*BG* 5/1); upper foot burrowed and burrows filled with sand from Eastover Formation; rounded quartz and phosphate pebbles up to 1 cm in diameter present at base	39–55

Patuxent Formation

Sand, fine to coarse, dominantly medium, micaceous; contains subangular to subrounded quartz pebbles up to 0.5 cm in diameter; upper foot burrowed and burrows filled with sand from St. Marys Formation; dark greenish gray (5*GY* 4/1) 55–61

Base of Yorktown Formation (zone 2): **+53 feet above sea level**
Base of Yorktown Formation (zone 1): **+42 feet above sea level**
Base of Eastover Formation: **+26 feet above sea level**
Base of St. Marys Formation: **+10 feet above sea level**

Bottomed in Patuxent Formation

LI–93–10: On southern side of Va. State Route 622, 0.4 mile north-northeast of intersection at Littleton of Va. State Route 622 and Va. State Route 35, in southeastern 1/9th of map area (latitude 36.9043° N., longitude 77.1429° W.). Surface elevation about 104 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine, silty, clayey; contains fine to coarse mica; dark yellowish orange (10*YR* 6/6) (0–1 foot) grading down rapidly to yellowish orange (10*YR* 7/6) with light gray (*N* 7) and red (5*R* 5/7) blotches	0–6
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine to medium, dominantly fine, silty; contains coarse mica; reddish orange (10*R* 6/6)	6–11
Sand, fine to medium with a minor coarse fraction, micaceous; very fine to fine dark heavy mineral grains abundant; pale yellowish orange (10*YR* 8/5), moderate orangish pink (10*R* 7/4), and dark yellowish orange (10*YR* 6/6); coarsens to medium to coarse in basal foot and contains subrounded to rounded quartz granules and pebbles up to 0.5 cm in diameter	11–16
Yorktown Formation (zone 2)	
Silt, sandy (very fine), clayey, finely micaceous, light brown (5*YR* 5/6) grading down rapidly through very pale orange (10*YR* 8/2) (16.5–17 feet) to dark yellowish orange (10*YR* 6/6)	16–21

Base of upper Bacons Castle Formation: **+98 feet above sea level**
Base of lower Bacons Castle Formation: **+88 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

LI–93–11: On southern side of Va. State Route 622, 0.4 mile south-southeast of intersection of Va. State Route 622 and Va. State Route 634, in south-central 1/9th of map area (latitude 36.9078° N., longitude 77.1772° W.). Surface elevation 89 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, fine to coarse; contains sparse grains of dark heavy minerals and frosted rounded quartz granules and pebbles up to 0.5 cm in diameter; pale yellowish brown (10*YR* 6/2) grading down through brown (5*YR* 5/5) (1–2 feet) to yellowish brown (10*YR* 6/4) with very light gray (*N* 8) mottles	0–13
Sand, fine to medium with minor subrounded to rounded coarse fraction, silty, grayish orangish pink (5*YR* 7/2)	13–21
Yorktown Formation (zone 2)	
Silt, sandy (very fine), clayey, finely micaceous; upper foot contains wood fragments, root casts, and sand-filled burrows; light bluish gray (5*B*7/1) with dark yellowish orange (10*YR* 6/6) mottles	21–26

Base of Windsor Formation: **+68 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

LI–93–12: On western side of Va. State Route 642, 0.5 mile south-southwest of intersection of Va. State Route 642 and Va. State Route 634, in southwestern 1/9th of map area (latitude 36.8990° N., longitude 77.2485° W.). Surface elevation 79 feet.

LITHOLOGY	DEPTH IN FEET
Colluvium	
Sand, very fine with scattered coarse to very coarse grains, silty, dark yellowish orange (10*YR* 6/6)	0–2
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), very finely micaceous; pseudoplinthite nodules abundant; dark yellowish orange (10*YR* 6/6) with light gray (*N* 7) and red (5*R* 5/7) mottles	2–6
Silt, clayey, sandy (very fine), very finely micaceous, very light gray (*N* 8) with light brown (5*YR* 6/7) mottles, grading down to very light gray (*N* 8)	6–18
Sand, medium, silty, clayey, very light gray (*N* 8)	18–19
Yorktown Formation (zone 1)	
Sand, fine to medium, silty; fine phosphate sand present; shelly; echinoid spine present; calcite-cemented lumps abundant; dusky yellow (2.5*Y* 5/4) grading down to bluish greenish gray (5*BG* 6/1)	19–26

Base of Yorktown Formation (zone 2): **+60 feet above sea level**

Bottomed in Yorktown Formation (zone 1)

LI–93–13: On southeastern side of J-shaped right-angle bend in unnumbered dirt road leading to unnamed cemetery, 0.05 mile east of cemetery and 1.1 mile north-northwest of intersection of Va. State Route 625 and Va. State Route 35, in north-central 1/9th of map area (latitude 36.9867° N., longitude 77.1944° W.). Surface elevation 126 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine to fine, silty, clayey, orange (5*YR* 5/7)	0–6
Sand, very fine to fine, clayey, silty, stiff, variegated moderate red (5*R* 5/6), dark yellowish orange (10*YR* 6/6), and pinkish gray (5*YR* 8/1)	6–11
Sand, fine, well-sorted; contains blebs of clay-silt interlayered with fine to medium sand that includes abundant very fine dark heavy minerals probably reworked from underlying unit; moderate reddish orange (10*R* 5/8)	11–25
Silt, clayey, pale red (5*R* 5/3) and light gray (*N* 7)	25–29
Sand, medium to coarse; clay-silt matrix; dark yellowish orange (10*YR* 6/6)	29–31
Yorktown Formation (zone 2)	
Silt, massive, dark yellowish orange (10*YR* 6/6)	31–32
Silt, clayey, greasy, finely micaceous, dark bluish greenish gray (5*BG* 4/1)	32–36

Base of upper Bacons Castle Formation: **+95 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

LI–93–14: On unnumbered dirt road, 0.1 mile south-southeast of intersection of dirt road and Va. State Route 625 at 121-foot spot elevation, in north-central 1/9th of map area (latitude 36.9942° N., longitude 77.1762° W.). Surface elevation 121 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine, silty, clayey; plinthite present at 5 feet, variegated moderate red (5*R* 5/6), dark yellowish orange (10*YR* 6/6), and pinkish gray (5*YR* 8/1)	0–7
Sand, very fine, clayey, silty, dark red (5*R* 3/6) and light gray (*N* 7)	7–12
Sand, dominantly fine with minor medium fraction; sand interlayered with a few clay-silt beds; very fine dark heavy minerals present in basal 2 feet; moderate reddish orange (10*R* 6/6) grading down to pale red (10*R* 6/2)	12–22
Yorktown Formation (zone 2)	
Silt, clayey, medium yellowish orange (10*YR* 7/6)	22–32

Base of upper Bacons Castle Formation: **+99 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

LI–93–15: 0.1 mile southwest of Va. State Route 35 at end of unnumbered dirt road, 1.15 mile northwest of Homeville, in north-central 1/9th of map area (latitude 36.9619° N., longitude 77.1849° W.). Surface elevation 121 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine, silty, clayey, dark yellowish orange (10*YR* 6/6)	0–7
Sand, very fine, clayey, silty, moderate red (5*R* 5/6) with light gray (*N* 7) mottles	7–12
Sand, fine with scattered medium grains, bright reddish orange (5*YR* 5/6); thin (1–2 inches), light gray (*N* 7), sandy (very fine) clay-silt lenses scattered throughout	12–23
Yorktown Formation (zone 2)	
Silt, sandy (very fine) in upper 2 feet, dark yellowish orange (10*YR* 6/6)	23–27
Silt, clayey, greasy, grayish orange (10*YR* 7/4)	27–31
Silt, clayey, silty; contains chalky *Mulinia* shells; medium greenish gray (5*G* 5/1)	31–32

Base of upper Bacons Castle Formation: **+98 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

LI–93–16: On northwestern side of Va. State Route 626, 0.6 mile east of western quadrangle border, in northwestern 1/9th of map area (latitude 36.9973° N., longitude 77.2390° W.). Surface elevation 122 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine, well-sorted, silty, dark yellowish orange (10*YR* 6/6)	0–2
Sand, very fine, silty, clayey, light brown (5*YR* 5/6); lower contact gradational	2–7
Sand, very fine to fine, silty, slightly clayey, variegated moderate red (5*R* 5/6), dark yellowish orange (10*YR* 6/6), and pinkish gray (5*YR* 8/1)	7–12
Sand, very fine to medium, dominantly fine, silty, micaceous, variegated moderate red (5*R* 5/6), dark yellowish orange (10*YR* 6/6), and pinkish gray (5*YR* 8/1)	12–18
Sand, fine to coarse, dominantly medium, grading down to medium to coarse sand; scattered grains of very fine dark heavy minerals; pale yellowish orange (10*YR* 8/6) grading down to variegated pale yellowish orange (10*YR* 8/6), dark yellowish orange (10*YR* 6/6), orangish pink (10*R* 8/4), and white (*N* 9)	18–25
Yorktown Formation (zone 2)	
Silt, finely micaceous, dark yellowish orange (10*YR* 6/6)	25–27

Base of upper Bacons Castle Formation: **+97 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

LI–93–17: On northeastern side of Va. State Route 35, 0.42 mile west-northwest of Plank Road, in north-central 1/9th of map area (latitude 36.9747° N., longitude 77.2052° W.). Surface elevation 68 feet.

LITHOLOGY	DEPTH IN FEET
Charles City Formation	
Sand, very fine to fine, silty, clayey, dark yellowish orange (10*YR* 6/6) grading down to very light gray (*N* 8) with dark yellowish orange (10*YR* 6/6) mottles	0–8
Sand, fine to medium, silty; about 1 percent very fine dark heavy mineral sand; dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) mottles	8–9
Yorktown Formation (zone 2)	
Silt, finely micaceous, sandy (fine), dark yellowish orange (10*YR* 6/6)	9–11
Yorktown Formation (zone 1)	
Sand, fine; includes abundant very fine dark heavy mineral grains; calcite-cemented lumps abundant in lower two-thirds of unit; *Chesapecten* fragments abundant near base; dusky yellow (5*Y* 6/4) grading down to grayish yellow (5*Y* 7/4); lower contact abrupt	11–24
Eastover Formation	
Silt, very clayey, dense, greasy, massive, medium bluish gray (5*B* 5/1); lower contact gradational	24–27
Sand, fine to medium, clayey, silty; scattered shell fragments present throughout including *Chesapecten* and *Isognomon*; bluish gray (5*B* 5/1); lower contact gradational	27–45
Sand, fine, clean; contains fine phosphate sand and sparse shell fragments; dark greenish gray (5*GY* 4/1); phosphate pebbles up to 2 cm in diameter at base	45–60
Patuxent Formation	
Sand, fine to medium; medium to coarse silvery mica abundant; light gray (*N* 7)	60–61

Base of Charles City Formation:	**+59 feet above sea level**
Base of Yorktown Formation (zone 2):	**+57 feet above sea level**
Base of Yorktown Formation (zone 1):	**+44 feet above sea level**
Base of Eastover Formation:	**+ 8 feet above sea level**

Bottomed in Patuxent Formation

LI–93–18: On southeastern side of right-angle turn to west in dirt road on northern side of Va. State Route 634, 0.95 mile north-northeast of Lumberton (at 81-foot benchmark), in south-central 1/9th of map area (latitude 36.8951° N., longitude 77.2067° W.). Surface elevation 84 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, dominantly fine but very fine to coarse, silty, clayey, dark yellowish orange (10*YR* 6/6) with light brownish gray (10*YR* 7/1) mottles	0–5
Yorktown Formation (zone 2)	
Silt, very clayey, dense; sparse grains of very fine to very coarse sand scattered throughout as well as spots of kaolin (saprolitized potassium feldspar grains); light brownish gray (10*YR* 7/1)	5–12
Silt, very clayey, light yellowish gray (5*Y* 9/1) with dark yellowish orange (10*YR* 6/6) mottles	12–25
Sand, fine to medium with sparse coarse grains, silty, clayey, light gray (*N* 7)	25–28
Yorktown Formation (zone 1)	
Sand, fine, well-sorted; phosphate sand abundant; contains calcite-cemented lumps; greenish gray (5*G* 5/1)	28–38
Eastover Formation	
Sand, fine to medium, well-sorted; scattered shells present throughout including *Mercenaria*, *Isognomon*, and *Chesapecten*; bluish greenish gray (5*BG* 5/1) grading down to greenish gray (5*G* 5/1)	38–49
Sand, very fine to fine, silty, dark greenish gray (5*G* 4/1)	49–52

Base of Windsor Formation: **+79 feet above sea level**
Base of Yorktown Formation (zone 2): **+56 feet above sea level**
Base of Yorktown Formation (zone 1): **+46 feet above sea level**

Bottomed in Eastover Formation

LI–93–19: On northwestern side of Va. State Route 632, 0.5 mile southeast of junction of Va. State Route 632 with Va. State Route 634, in southwestern 1/9th of map area (latitude 36.8899° N., longitude 77.2241° W.). Surface elevation 81 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, fine to very coarse, very poorly sorted; subangular to subrounded granules and subangular pebbles up to 1 cm in diameter abundant; dark yellowish orange (10*YR* 6/6) grading down to orange (5*YR* 6/6)	0–17
Yorktown Formation (zone 2)	
Silt, clayey, dark yellowish orange (10*YR* 6/6) with light gray (*N* 7) mottles; lower contact somewhat gradational	17–24
Silt, clayey, greasy, medium bluish gray (5*B* 5/1); lower contact somewhat gradational	24–26
Silt, clayey, greasy, shelly (*Mulinia*, *Turritella*, oyster, and other mollusks), medium bluish gray (5*B* 5/1)	26–27
Yorktown Formation (zone 1)	
Sand, fine, silty; contains calcite-cemented lumps; medium bluish greenish gray (5*BG* 5/1)	27–32

Base of Windsor Formation: **+64 feet above sea level**
Base of Yorktown Formation (zone 2): **+54 feet above sea level**

Bottomed in Yorktown Formation (zone 1)

LI–93–20: On southeastern side of Va. State Route 40, on western side of dirt road leading south-southeast from Va. State Route 40 at 51-foot spot elevation, 0.55 mile west-southwest of Va. State Route 40 bridge over Nottoway River, in west-central 1/9th of map area (latitude 36.9296° N., longitude 77.2113° W.). Surface elevation 51 feet.

LITHOLOGY	DEPTH IN FEET
Chuckatuck Formation	
Silt, very clayey, sandy (fine), light brownish gray (5*YR* 7/1) with dark yellowish orange (10*YR* 6/6) mottles; lower contact gradational	0–3
Silt, very clayey with interbedded laminae of very fine sand, light brownish gray (5*YR* 7/1) grading down to pale orange (10*YR* 7/2); lower contact gradational	3–8
Sand, fine to medium, poorly sorted, silty and clayey, light gray (*N* 7); lower contact gradational	8–10
Sand, medium to coarse, granular; coarse potassium feldspar grains abundant; pinkish gray (5*YR* 8/1)	10–15
Sand, fine to medium, well-sorted; contains scattered quartz granules; medium light gray (*N* 6)	15–16
Eastover Formation	
Silt, very clayey, dense, sandy, bluish gray (5*B* 6/1) with grayish bluish green (5*BG* 5/2) mottles	16–17
Sand, fine, clayey, silty, grayish bluish green (5*BG* 5/2) with streaks of dark yellowish orange (10*YR* 6/6)	17–23
Sand, fine, well-sorted, slightly micaceous, bluish greenish gray (5*BG* 5/1)	23–27
Sand, fine to very coarse, clean; contains medium to very coarse grains of phosphate sand and scattered subrounded to rounded quartz pebbles up to 2 cm in diameter, very light gray (*N* 8)	27–33
Gravel containing subangular to subrounded quartz pebbles up to 3 cm in diameter in medium to coarse quartz sand matrix; greenish gray (5*GY* 6/1) to dark greenish gray (5*G* 4/1)	33–35
Patuxent Formation	
Sand, medium to coarse; contains polished quartz granules and pebbles up to 1.5 cm in diameter; greenish gray (5*G* 6/1)	35–36

Base of Chuckatuck Formation: **+35 feet above sea level**
Base of Eastover Formation: **+16 feet above sea level**

Bottomed in Patuxent Formation

Manry Quadrangle

MA–93–1: On western side of Va. State Route 620, 0.2 mile southwest of dam for Brittles Millpond, in northeastern 1/9th of map area (latitude 36.9638° N., longitude 77.0093° W.). Surface elevation 80 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, medium to coarse, grading down to coarse to very coarse, poorly sorted sand; yellowish brown (10*YR* 5/2) grading down through very pale orange (10*YR* 8/2) to orange (5*YR* 5/8)	0–5
Gravel containing subrounded to rounded quartz pebbles up to 5 cm in diameter, in medium to very coarse sand matrix; orange (5*YR* 5/8)	5–6
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), very finely micaceous; sparse shells near base; medium bluish greenish gray (5*BG* 5/1)	6–17
Yorktown Formation (zone 1)	
Sand, fine to medium; fine to coarse phosphate sand abundant at top but decreases in abundance downward; silty in upper 5 feet but more sandy below; very shelly (*Mulinia* and oysters); medium greenish gray (5*G* 5/1) grading down to medium bluish greenish gray (5*BG* 6/1)	17–35
Sand, fine to medium; phosphate sand abundant; silty; very shelly and diverse fauna (including *Chesapecten* and *Crassinella*); medium greenish gray (5*G* 5/1)	35–45
Eastover Formation	
Sand, fine, sparsely phosphatic, well-sorted, slightly silty and clayey; *Isognomon* abundant in upper 2 feet; dark greenish gray (5*G* 4/1)	45–70
Sand, very fine to fine, silty and clayey; scattered lenses of clayey silt present; dark greenish gray (5*G* 4/1)	70–75
Sand, very fine to fine, well-sorted, slightly silty and clayey, sparsely shelly; no basal lag bed; dark greenish gray (5*G* 4/1)	75–88

St. Marys Formation

Silt, very clayey, sandy (very fine); upper foot contains burrows filled with sand from overlying unit; dark greenish gray (5*G* 4/1)..... 88–100

Base of lower Bacons Castle Formation: **+74 feet above sea level**
Base of Yorktown Formation (zone 2): **+63 feet above sea level**
Base of Yorktown Formation (zone 1): **+35 feet above sea level**
Base of Eastover Formation: **-8 feet below sea level**

Bottomed in St. Marys Formation

MA–93–2: On northern side of Va. State Route 605 in driveway to abandoned house, 100 feet east of intersection of Va. State Route 605 and Va. State Route 633, in southeastern 1/9th of map area (latitude 36.8857° N., longitude 77.0094° W.). Surface elevation 94 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, very fine to fine, silty, moderate yellowish orange (10*YR* 7/6) grading down to moderate yellowish orange (10*YR* 7/6) with moderate reddish orange (10*R* 5/7) and very light gray (*N* 8) mottles	0–5
Sand, very fine to fine, silty and clayey, moderate yellowish orange (10*YR* 7/6) with moderate reddish orange (10*R* 5/7) and very light gray (*N* 8) mottles	5–9
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, medium to coarse, slightly silty and clayey; dark fine heavy mineral grains abundant; micaceous, moderate yellowish orange (10*YR* 7/6) with moderate reddish orange (10*R* 5/7) and very light gray (*N* 8) mottles	9–11
Sand, fine to coarse, subrounded to rounded; dark fine heavy mineral grains abundant; moderate orangish pink (10*R* 8/4) grading down to very pale orange (10*YR* 8/2) by 22 feet	11–26
Sand, coarse to very coarse, subangular to subrounded; sparse fine heavy mineral grains present; kaolinitic clay matrix; quartz granules at top coarsen downward to quartz pebbles up to 1 cm in diameter at base; very pale orange (10*YR* 9/1) grading down to dark yellowish orange (10*YR* 6/8) in basal foot	26–34
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), micaceous, greenish gray (5*G* 5/1)	34–49
Silt; contains hard waxy clay lumps that break rather than deform; medium greenish gray (5*G* 5/1)	49–50
Sand, very fine to fine, silty, shelly (all *Mulinia*), greenish gray (5G 5/1)	50–51

Yorktown Formation (zone 1)

Sand, very fine to fine quartz, fine to medium phosphate, shelly (oysters, *Chesapecten*, *Mercenaria*, and other shells); abundant calcite-cemented lumps present (often around shells); coarsens near base to fine to medium and mostly quartz sand; medium bluish greenish gray (5*BG* 5/1) 51–63

Eastover Formation

Sand, fine, well-sorted; rare grains of phosphate sand; silty and clayey in upper foot; *Chesapecten middlesexensis* and *Isognomon* abundant at top but less so downward; greenish gray (5*G* 5/1)..... 63–71

Base of Windsor Formation: **+85 feet above sea level**
Base of lower Bacons Castle Formation: **+60 feet above sea level**
Base of Yorktown Formation (zone 2): **+43 feet above sea level**
Base of Yorktown Formation (zone 1): **+31 feet above sea level**

Bottomed in Eastover Formation

MA–93–3: On eastern side of Va. State Route 628 in driveway to abandoned house, 0.32 mile north-northeast of intersection of Va. State Route 628 and Va. State Route 605 at Manry, in southeastern 1/9th of map area (latitude 36.8960° N., longitude 77.0324° W.). Surface elevation 109 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Moorings unit)	
Sand, fine, well-sorted, minor medium to coarse rounded fraction, pale yellowish brown (10*YR* 7/2)	0–2
Sand, fine, well-sorted, minor medium to coarse rounded fraction, silty, dark yellowish orange (10*YR* 6/7) grading down to grayish orange (10*YR* 6/2)	2–6
Sand, very fine to fine, well-sorted; abundant very fine dark heavy mineral grains present; very pale orange (10*YR* 8/2)	6–11
Sand, very fine to fine, well-sorted; abundant very fine dark heavy mineral grains present; very pale orange (10*YR* 8/2); contains 2- to 3-inch-thick interbeds of very light gray (*N* 8), very clayey silt	11–14
Upper Bacons Castle Formation (Bahramsville Member)	
Silt, very clayey, sandy (very fine), stiff, very light gray (*N* 8)	14–16
Sand, very fine to fine; sparse very fine dark heavy mineral grains present; silty, micaceous, very light gray (*N* 8)	16–20
Silt, very clayey, sandy (very fine), micaceous, stiff, very light gray (*N* 8), interbedded at 2–3 inch intervals with pale yellowish orange (5*YR* 8/6), micaceous, silty, very fine to fine sand	20–24
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine to coarse, grading down to fine to very coarse, subangular to subrounded sand; contains sparse dark heavy mineral grains; light pinkish gray (5*YR* 9/1)	24–30
Sand, fine to very coarse, subangular to subrounded; contains sparse dark heavy mineral grains and subangular to subrounded quartz pebbles up to 1 cm in diameter; dark yellowish orange (10*YR* 6/6)	30–38

Yorktown Formation (zone 2)

Silt, clayey, finely micaceous; sparse plinthite lumps present;
olive orange (3*Y* 5/8)..... 38–40

Silt, clayey, finely micaceous, bluish greenish gray (5*BG* 5/1)..... 40–55

Base of upper Bacons Castle Formation: **+85 feet above sea level**
Base of lower Bacons Castle Formation: **+71 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

MA–93–4: On eastern side of dirt road, 0.04 mile north of unnumbered road at 113-foot spot elevation, 0.85 mile northwest of spillway of Mill Run Pond, in south-central 1/9th of map area (latitude 36.8927° N., longitude 77.0626° W.). Surface elevation 112 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine, silty, clayey, sparsely micaceous, grayish orange (10*YR* 7/4) grading down to dark yellowish orange (10*YR* 6/6) with red (5*R* 5/7), very light gray (*N* 8), and orange (5*YR* 5/8) mottles; lower contact gradational	0–7
Silt, very clayey, sandy (fine), dark yellowish orange (10*YR* 6/6) with red (5*R* 5/7), very light gray (*N* 8), and orange (5*YR* 5/8) mottles	7–10
Silt, very clayey, sandy (fine), dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) mottles	10–15
Silt, very clayey, sandy (fine), very light gray (*N* 8)	15–22
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine to fine, silty; very fine dark heavy mineral grains abundant; dark yellowish orange (10*YR* 6/6); lower contact gradational	22–30
Sand, fine to medium; very fine dark heavy mineral grains abundant; scattered silvery mica flakes up to 1 mm in diameter present; orangish gray (5*YR* 8/1); lower contact gradational	30–35
Sand, fine to very coarse; fine dark heavy mineral grains abundant; scattered silvery mica flakes up to 1 mm in diameter present; orangish gray (5*YR* 8/1); lower contact gradational	35–44
Sand, coarse to very coarse; contains subangular quartz granules; orangish gray (5*YR* 8/1)	44–45
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine); small silvery mica flakes abundant; bluish greenish gray (5*BG* 5/1)	45–46

Base of upper Bacons Castle Formation: **+90 feet above sea level**
Base of lower Bacons Castle Formation: **+67 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

MA–93–5: On northeastern side of intersection of dirt road and Va. State Route 605 at 103-foot spot elevation, 0.47 mile north-northwest of Union Hill Church, in southwestern 1/9th of map area (latitude 36.9035° N., longitude 77.0964° W.). Surface elevation 103 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine, silty, clayey, grayish orange (10*YR* 7/4); lower contact gradational	0–1
Silt, very clayey, sandy (very fine), stiff, dense, dark yellowish orange (10*YR* 6/6) with red (5*R* 5/7), orange (5*YR* 5/8), and very light gray (*N* 8) mottles; pseudoplinthite lumps in basal foot	1–7
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine to medium with minor coarse fraction; contains scattered very fine to fine dark heavy mineral grains; dark yellowish orange (10*YR* 6/7); lower contact gradational	7–15
Sand, fine to medium, grading down to medium to coarse sand;thixotropic, yellowish orange (10*YR* 7/6); lower contact gradational	15–25
Sand, medium to coarse; subangular to subrounded quartz pebbles up to 1.5 cm in diameter increasingly abundant downward; yellowish orange (10*YR* 7/6)	25–29
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), micaceous, orange (5*YR* 5/8) with black (*N* 1) mottles, grading down to light brown (5*YR* 6/4)	29–30
Silt, clayey, sandy (very fine), micaceous, medium bluish greenish gray (5*BG* 5/1)	30–37

Base of upper Bacons Castle Formation: **+96 feet above sea level**
Base of lower Bacons Castle Formation: **+74 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

MA–93–6: On northwestern side of Va. State Route 620 at entrance to dirt road near 114-foot elevation benchmark, 1.0 mile west of Wakefield Community Hunt Club, in east-central 1/9th of map area (latitude 36.9494° N., longitude 77.0327° W.). Surface elevation 114 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Silt, very clayey, sandy (very fine), dense, stiff, yellowish brown (10*YR* 6/4) with light gray (*N* 7), dark yellowish orange (10*YR* 6/6), and red (5*R* 5/7) mottles	0–6
Silt, very clayey, sandy (very fine), dense, stiff, dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) mottles	6–11
Silt, clayey, sandy (very fine to fine), dense, stiff, very light gray (*N* 8) with dark yellowish orange (10*YR* 6/6) mottles	11–16
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine to medium with minor rounded coarse fraction; very fine to fine dark heavy minerals abundant; thixotropic, dark yellowish orange (10*YR* 6/6)	16–21

Base of upper Bacons Castle Formation: **+98 feet above sea level**

Bottomed in lower Bacons Castle Formation

MA–93–7: On western side of Va. State Route 628 at entrance to dirt road, 0.52 mile southwest of Burton Grove Church, in east-central 1/9th of map area (latitude 36.9201° N., longitude 77.0194° W.). Surface elevation 118 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Moorings unit)	
Sand, very fine to fine, well-sorted, grayish yellow (5*YR* 8/4) grading down to yellowish orange (10*YR* 6/8)	0–6
Sand, very fine to fine with minor medium to coarse fraction, silty, clayey, micaceous, moderate yellowish brown (10*YR* 6/4); lower contact gradational	6–13
Sand, very fine to fine with minor medium to coarse fraction; dark heavy mineral grains present; thixotropic, grayish orangish pink (5*YR* 7/2)	13–22
Upper Bacons Castle Formation (Bahramsville Member)	
Silt, sandy (very fine), clayey, dark yellowish orange (10*YR* 6/6)	22–23
Silt, sandy (very fine), clayey, medium bluish greenish gray (5*BG* 5/1)	23–26
Silt, very clayey, sandy (very fine to fine), dense, stiff, grayish orange (10*YR* 7/4) and moderate yellowish brown (10*YR* 5/4) grading down through yellowish brown (10*YR* 5/4) and very light gray (*N* 8) to very light gray (*N* 8) with sparse mottles of yellowish brown (10*YR* 5/4)	26–31

Base of upper Bacons Castle Formation: **+96 feet above sea level**

Bottomed in upper Bacons Castle Formation

MA–93–8: On eastern side of Va. State Route 604 at entrance to dirt road just south of Norfolk and Western Railroad line near 112-foot spot elevation, in northeastern 1/9th of map area (latitude 36.9926° N., longitude 77.0281° W.). Surface elevation 106 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine, clayey, silty, grading down to stiff, dense, sandy (very fine), very clayey silt; dark yellowish orange (10*YR* 6/6) with light gray (*N* 7) mottles	0–7
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine to medium, silty, clayey; scattered grains of dark very fine minerals present; dark yellowish orange (10*YR* 6/6) with light gray (*N* 7) mottles	7–10
Sand, fine to medium, well-sorted, silty; abundant grains of dark very fine minerals present; grayish orange (10*YR* 7/4)	10–19
Sand, fine to coarse; coarse fraction subrounded to rounded; silty; scattered grains of dark very fine minerals present; contains scattered subrounded to rounded quartz granules and pebbles up to 0.5 cm in diameter; light gray (*N* 7)	19–28
Sand, medium to very coarse; contains subrounded to rounded quartz pebbles up to 2.5 cm in diameter and a single silt clast of reworked Yorktown Formation, 2 cm in diameter; medium gray (*N* 6) grading down to dark gray (*N* 4)	28–31
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), moderate yellowish brown (10*YR* 5/4); about 1 inch of unit on end of auger stem	at 31

Base of upper Bacons Castle Formation: **+99 feet above sea level**
Base of lower Bacons Castle Formation: **+75 feet above sea level**

Bottomed on Yorktown Formation (zone 2)

MA–93–9: On southern side of Va. State Route 604 at entrance to dirt road at 113-foot spot elevation, in north-central 1/9th of map area (latitude 36.9695° N., longitude 77.0730° W.). Surface elevation 113 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Silt, very clayey, sandy (very fine), dense, sticky, dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) and red (5*R* 5/7) mottles	0–8
Silt, very clayey, sandy (very fine), dense, sticky, dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) mottles	8–15
Silt, very clayey, sandy (very fine), dense, sticky, very light gray (*N* 8) with dark yellowish orange (10*YR* 6/6) mottles	15–17
Sand, very fine, silty, dark yellowish orange (10*YR* 6/6)	17–18
Silt, very clayey, sandy (very fine), dense, sticky; contains thin lenses of very fine sand; moderate yellowish brown (10*YR* 5/4) with light gray (*N* 7) and very light gray (*N* 8) mottles	18–27
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine to medium, silty; dark heavy mineral grains abundant; dark yellowish orange (10*YR* 6/6)lower contact gradational	27–32
Sand, medium to coarse; coarse fraction rounded; contains scattered grains of dark heavy minerals and subangular to subrounded quartz pebbles up to 2 cm in diameter; dark yellowish orange (10*YR* 6/6)	32–42
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), yellowish orange (10*YR* 6/8)	42–43
Silt, clayey, sandy (very fine), finely micaceous, medium bluish greenish gray 5*BG* 5/1)	43–46

Base of upper Bacons Castle Formation: **+86 feet above sea level**
Base of lower Bacons Castle Formation: **+71 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

MA–93–10: On eastern side of Va. State Route 606 along northern edge of field, 0.28 mile northeast of intersection of Va. State Route 606 and Va. State Route 604, in west-central 1/9th of map area (latitude 36.9523° N., longitude 77.0972° W.). Surface elevation 109 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Silt, clayey, grading down to stiff, dense, sandy (very fine), very clayey silt; dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) and red (5*R* 5/7) mottles	0–9
Sand, very fine, silty, light red (5*R* 6/6)	9–9.5
Silt, very clayey, sandy (very fine), dense, stiff, dark yellowish orange (10*YR* 6/6) with very light gray (*N* 8) and red (5*R* 5/7) mottles	9.5–12
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine, well-sorted, silty; sparse grains of very fine heavy minerals present; dark yellowish orange (10*YR* 6/7); lower contact gradational	12–25
Sand, fine to medium; very fine heavy mineral grains moderately abundant; dark yellowish orange (10*YR* 6/7); lower contact gradational	25–31
Sand, fine to coarse; coarse fraction rounded; grayish orange (10*YR* 7/4)	31–33
Sand, medium to very coarse; subrounded quartz pebbles up to 2 cm in diameter abundant; grayish orange (10*YR* 7/4)	33–34
Yorktown Formation (zone 2)	
Silt, sandy (very fine), clayey, orange (5*YR* 5/8) grading down to light brown (5*YR* 6/4)	34–36
Silt, sandy (very fine), clayey, finely micaceous, medium bluish greenish gray (5*BG* 5/1)	36–41

Base of upper Bacons Castle Formation: **+97 feet above sea level**
Base of lower Bacons Castle Formation: **+75 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

MA–93–11: On southern side of Va. State Route 655 at entrance to dirt road at 113-foot spot elevation, 0.36 mile east of western quadrangle border, in northwestern 1/9th of map area (latitude 36.9940° N., longitude 77.1183° W.). Surface elevation 113 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Silt, very clayey, sandy (very fine), plinthitic, red (5*R* 5/6) with dark yellowish orange (10*YR* 6/6) mottles	0–12
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine, silty; dark very fine heavy mineral grains abundant; grayish orange (10*YR* 7/4)	12–24
Sand, fine to coarse; coarse fraction rounded; dark fine heavy mineral grains abundant; grayish orange (10*YR* 7/4); at 32 feet is a 1-inch-thick layer (or large clay ball) of pale grayish orange (5*YR* 8/2), clayey silt	24–35
Silt, very clayey, greasy, grayish orange (5*YR* 6/2)	35–37
Sand, fine to medium, silty; 2-inch-thick, dense pebble bed at base with subangular to subrounded quartz clasts up to 3 cm in diameter; grayish orange (5*YR* 6/2)	37–39
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), finely micaceous, medium bluish greenish gray (5*BG* 5/1)	39–46

Base of upper Bacons Castle Formation: **+101 feet above sea level**
Base of lower Bacons Castle Formation: **+74 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

MA–94–12: Continuous core taken on northeastern side of spillway for Brittles Millpond (also called Airfield Pond), 0.37 mile west of eastern quadrangle border and 2.03 miles south of northern quadrangle border, in northeastern 1/9th of map area (latitude 36.9706° N., longitude 77.0073° W.). Surface elevation 91 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Moorings unit)	
Sand, mostly very fine to medium but with minor fraction of rounded coarse sand and granules, slightly micaceous, pale yellowish brown (10*YR* 6/2) grading down to grayish orange (10*YR* 7/4)	0–1
Sand, fine to medium; goethite and limonite in interstitial spaces; light brown (5*YR* 5/6) with yellowish gray (5*Y* 8/1) mottles	1–3
Sand, fine to medium; contains sparse very fine to fine dark heavy minerals; sparsely micaceous, silty, slightly clayey, grayish orange (10*YR* 7/4)	3–5
(No recovery)	5–8
Sand, medium, grading down to medium to coarse, Subrounded sand; very fine to fine dark heavy minerals abundant; sparsely micaceous; contains subrounded pebble 7 mm in diameter near base; dark yellowish orange (10*YR* 6/6) grading down to pale orange (10*YR* 8/2)	8–12
Sand, coarse to very coarse; contains rare coarse flakes of silvery mica; pale orange (10*YR* 8/2)	12–13.5
Sand, medium to coarse, slightly silty and clayey, dark yellowish orange (10*YR* 6/7)	13.5–15
Sand, coarse to very coarse, pale orange (10*YR* 8/2)	15–15.5
Sand, medium to coarse, feldspathic, pale orange (10*YR* 8/2)	15.5–19
Sand, medium to coarse, feldspathic, clayey and silty; contains a subrounded quartz pebble; dark yellowish orange (10*YR* 6/7)	19–20

Sand, medium to coarse, grading down through coarse to very coarse and back to medium, feldspathic sand; contains subangular pebbles of quartz in lower half; pale orange (10*YR* 8/2) grading down to dark yellowish orange (10*YR* 6/7) 20–22.5

Sand, medium to coarse; contains quartz pebbles and discoids up to 3 cm in diameter at base; plinthite at base; dark yellowish orange (10*YR* 6/8)..... 22.5–23

Yorktown Formation (zone 2)

Silt, clayey; fine sand fills burrows; light brown (10*YR* 5/6) 23–25

Silt, clayey, light brown (10*YR* 5/6); lower contact somewhat gradational..... 25–26

Silt, clayey, sandy (very fine), bluish gray (5*B* 5/1) 26–38

Silt, clayey, contains quartz and phosphate sand (very fine); wavy laminations present; sparsely shelly, bluish gray (5*B* 5/1)..... 38–40

Yorktown Formation (zone 1)

Sand, quartz-phosphate, very fine to fine, glauconitic, shelly (*Mulinia*, *Chesapecten*, *Turritella*, and other mollusks); contains calcite-cemented intervals; medium bluish gray (5*B* 5/1) 40–50

(No recovery) 50–51

Sand, quartz-phosphate, fine, well-sorted, shelly; no indurated zones; dark bluish greenish gray (5*BG* 4/1)..... 51–56

(No recovery) 56–57

Sand, quartz-phosphate, fine, well-sorted, shelly; no indurated zones; broken and rolled fragments of bones and *Isognomon* at base; dark bluish greenish gray (5*BG* 4/1) 57–59

Eastover Formation

Sand, quartz-phosphate, very fine to fine, well-sorted; *Isognomon* abundant; dark greenish gray (5*GY* 4/1) 59–61

Sand, fine, well-sorted; sparse shells; dark greenish gray (5*GY* 4/1)..... 61–71

Sand, fine, well-sorted, slightly clayey and silty, shelly (mostly *Chesapecten* and *Turritella*), dark greenish gray (5*GY* 4/1) 71–74.5

(No recovery) 74.5–76

Sand, fine, well-sorted, shelly (mostly *Chesapecten* and *Turritella*), dark greenish gray (5*GY* 4/1); lower contact abrupt, but no lag bed 76–104.5

Sand, fine, well-sorted, slightly clayey, finely micaceous, shelly (mostly *Chesapecten* and *Turritella*); contains burrows in top foot filled with overlying sand lithology ; grayish green (5*G* 5/2) 104.5–106

Sand, fine, well-sorted, finely micaceous, shelly (mostly *Chesapecten* and *Turritella*), dark greenish gray (5*GY* 4/1) 106–110

Sand, medium to coarse; contains scattered rare quartz and phosphate granules; dark greenish gray (5*GY* 4/1) 110–111

St. Marys Formation (unnamed member, DN 9 / lower DN 10?)

Silt, very clayey, finely micaceous, stiff, laminated; upper 6 inches burrowed; grayish olive green (5*GY* 3/2) 111–118.5

Sand, fine to coarse, poorly sorted, clayey and silty; contains granules of phosphate and quartz; grayish olive green (5*GY* 3/2); lower contact abrupt 118.5–120.5

St. Marys Formation (Windmill Point Member, DN 9)

Silt, very clayey, massive; contains burrows in top foot filled with overlying sand lithology; bluish greenish gray (5*BG* 5/1) 120.5–124

Sand, fine to coarse, poorly sorted, silty and clayey, sparsely shelly; contains phosphate sand and granules of phosphate and quartz; bluish greenish gray (5*BG* 5/1) 124–131

Sand, fine to coarse, poorly sorted, silty and clayey, sparsely shelly; sharks teeth present; phosphate sand and granules of phosphate and quartz increasingly abundant downward; greenish gray (5*G* 5/1) 131–132

Gravel containing mostly quartz and some phosphate pebbles and cobbles up to 8 cm in diameter; greenish gray (5*G* 5/1) 132–133

Aquia Formation

Sand, fine to medium, medium fraction mostly phosphate and glauconite, clayey matrix; upper foot burrowed with burrows filled with overlying sand and gravel lithology; sparsely shelly; indurated lumps present; greenish black (5*GY* 2/1) with grayish bluish green (5*BG* 5/2) blotches 133–139

(No recovery) 139–140.5

Sand, fine to medium, medium fraction mostly phosphate and glauconite, clayey matrix, sparsely shelly; indurated lumps present; greenish black (5*GY* 2/1) 140.5–143

(No recovery) 143–144

Sand, fine to medium, medium fraction mostly phosphate and glauconite, clayey matrix, sparsely shelly; indurated lumps present; greenish black (5*GY* 2/1) 144–145.5

(No recovery) 145.5–147

Sand, fine to medium, mostly glauconite, black (*N* 1) 147–149

(No recovery) 149–152

Sand, glauconite-quartz, dominantly fine to medium; rare coarse quartz grains, quartz granules, and a quartz pebble, 1.5 cm in length; black (*N* 1) 152–154

Sand, glauconite-quartz, fine to medium, black (*N* 1) 154–157

Sand, glauconite-quartz, dominantly fine to medium; contains rare coarse quartz fraction; black (*N* 1) 157–159

Gravel containing quartz pebbles up to 3 cm in diameter; pebbles only slightly stained; burrows from this horizon extend 1.5 feet into layer below 159–159.5

Patapsco Formation

Sand, medium to coarse, poorly sorted, kaolinitic;
contains rounded quartz granules and small pebbles;
light greenish gray (5*G* 8/1); lower contact abrupt 159.5–166.5

Sand, fine to medium, poorly sorted; contains a few
quartz granules but no pebbles; sparsely micaceous,
light greenish gray (5*G* 8/1) 166.5–172

Gravel containing quartz pebbles; light greenish gray (5*G* 8/1) 172–172.5

Sand, fine to medium, poorly sorted; contains a few
quartz granules but no pebbles; sparsely micaceous,
light greenish gray (5*G* 8/1) 172.5–176

Sand, coarse to very coarse, pebbly, light greenish
gray (5*G* 8/1) 176–192.5

Gravel containing quartz pebbles and granules; light
greenish gray (5*G* 8/1); lower contact abrupt 192.5–193

Silt, clayey, laminated, medium gray (*N* 4);
contains Patapsco Formation pollen assemblage 193–194

Sand, medium to coarse, poorly sorted, light greenish
gray (5*G* 8/1) 194–196

Sand, coarse to very coarse, pebbly, light greenish
gray (5*G* 8/1) 196–204

Silt, very clayey, laminated, greenish gray (5G 5/1)
and light olive brown (5*Y* 5/6) 204–209.5

Silt, very clayey, laminated, light gray (*N* 7) 209.5–223

Base of upper Bacons Castle Formation:	**+68.0 feet above sea level**
Base of Yorktown Formation (zone 2):	**+51.0 feet above sea level**
Base of Yorktown Formation (zone 1):	**+32.0 feet above sea level**
Base of Eastover Formation:	**-20.0 feet below sea level**
Base of St Marys Formation (unnamed member):	**-29.5 feet below sea level**
Base of St Marys Formation (Windmill Point Member):	**-42.0 feet below sea level**
Base of Aquia Formation:	**-68.5 feet below sea level**

Corehole bottomed in Patapsco Formation

Margarettsville Quadrangle

MV–93–1: On northern side of N.C. State Route 701 at sharp bend in road, 0.83 mile west of Branches Bridge, in southeastern 1/9th of map area (latitude 36.5312° N., longitude 77.2761° W.). Surface elevation 38 feet.

LITHOLOGY	DEPTH IN FEET
Shirley Formation	
Sand, very fine to very coarse, dominantly fine to medium, silty, orange (5*YR* 5/7) grading down to dark yellowish orange (10*YR* 6/6); lower contact gradational	0–6
Sand, medium to very coarse, poorly sorted; contains subrounded quartz pebbles up to 2.5 cm in diameter; dark yellowish orange (10*YR* 6/6)	6–9
Yorktown Formation (zone 2)	
Silt, clayey, shelly (mostly *Mulinia* and *Turritella*); basal lag bed includes subrounded to rounded quartzite and vein quartz pebbles up to 3 cm in diameter, oyster fragments, and a shark's tooth (*Hemipristis serra*); some pebbles have pyrite crystals on them; medium bluish gray (5*B* 5/1)	9–13
Yorktown Formation (zone 1)	
Sand, fine, well-sorted; phosphate sand abundant; shelly at top but less so downward; olive gray (5*Y* 6/1) grading down to dark olive gray (5*Y* 4/1); at base, grades to fine to coarse, mostly medium sand; burrows in top of bed below filled with this lithology	13–30
Eastover Formation	
Silt, clayey, interbedded with silty and clayey, fine sand; greenish gray (5*G* 4/1); lower contact somewhat gradational	30–33
Sand, fine, well-sorted, silty; contains scattered rotten chalky shells; greenish gray (5*GY* 4/1)	33–39
Sand, fine to coarse, clayey, silty; contains granules of quartz and phosphate and pebbles of quartz up to 1 cm in diameter; greenish gray (5*GY* 4/1)	39–41

Sand, medium to very coarse, coarse to very coarse fraction polished, garnetiferous, light gray (*N* 7), contains clay balls of coarsely micaceous, very clayey silt; medium bluish greenish gray (5*BG* 5/1) 41–49

Clubhouse Formation

Sand, very fine, clayey; fine to coarse mica very abundant; olive black (5*Y* 3/1); upper foot contains burrows filled with sand from overlying unit 49–53

Silt, very clayey, dense, greasy, lumpy, olive black (5*Y* 3/1); top of unit burrowed and filled with sand from overlying unit; lower contact somewhat gradational 53–57

Silt, very clayey, sandy (very fine), dense; top of bed contains graphite fragments; light brownish gray (5*YR* 6/1) grading down to light gray (*N* 7) 57–61

Silt, very clayey, dense, micaceous, olive black (5*Y* 3/1) 61–69

Silt, very clayey; lignitic near top and near base; light gray (*N* 7) grading down to olive black (5*Y* 3/1) 69–80

Silt, very clayey, dense, light gray (*N* 7) 80–81

Base of Shirley Formation:	**+29 feet above sea level**
Base of Yorktown Formation (zone 2):	**+25 feet above sea level**
Base of Yorktown Formation (zone 1):	**+8 feet above sea level**
Base of Eastover Formation:	**-11 feet below sea level**

Bottomed in Clubhouse Formation

MV–93–2: On western side of unnumbered N.C. State road at sharp bend in road, 0.70 mile southwest of Sharon Church, in south-central 1/9th of map area (latitude 36.5098° N., longitude 77.3105° W.). Surface elevation 110 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, fine to coarse, poorly sorted, pale yellowish brown (10*YR* 6/2) grading down to grayish orange (10*YR* 8/2)	0–1
Sand, fine to medium, poorly sorted, silty, slightly clayey, dense, stiff; very coarsely micaceous in basal foot; dark yellowish orange (10*YR* 6/6) with red (5*R* 5/6) and light gray (*N* 7) mottles	1–5
Sand, fine, clayey, silty, dense, stiff, red (5*R* 5/6) with dark yellowish orange (10*YR* 6/6) and light gray (*N* 7) mottles	5–11
Sand, fine to coarse, poorly sorted, pale yellowish brown (10*YR* 8/6) with white (*N* 9) streaks, grading down in basal foot to dark yellowish orange (10*YR* 6/6)	11–25
Silt, very clayey, slightly micaceous, slightly greasy, moderate pink (5*R* 7/4)	25–27
Sand, medium to very coarse, poorly sorted, angular, moderate pink (5*R* 7/4)	27–29
Silt, very clayey, slightly micaceous, slightly greasy, moderate pink (5*R* 7/4)	29–31
Silt, very clayey, very pale orange (10*YR* 8/2), interbedded with dark yellowish orange (10*YR* 6/6), very fine to fine sand	31–33
Silt, very clayey, slightly greasy, with lenses of very fine to fine sand; micaceous, medium bluish gray (5*B* 5/1)	33–35
Mix of sand, silt, and clay; diverse colors; appears churned	35–43
Sand, medium to coarse, pale yellowish orange (10*YR* 8/4)	43–49
Gravel containing subrounded quartz pebbles up to 2 cm in diameter; pale yellowish orange (10*YR* 8/4)	49–51

Chowan River Formation

Sand, fine, well-sorted; very fine dark heavy mineral grains abundant; silty, clayey, orange (5*YR* 5/6) grading down to dark yellowish orange (10*YR* 6/6) with stringers of light gray (*N* 7) 51–62

Sand, fine, well-sorted; very fine dark heavy mineral grains abundant; silty, clayey, medium bluish gray (5*B* 5/1) 62–73

Sand, quartz-phosphate, fine, well-sorted; shell hash and bone fragment present in basal foot; greenish black (5*G* 3/1) 73–81

Yorktown Formation (zone 2)

Silt, clayey, finely micaceous, shelly; polished, rounded quartz pebbles up to 2 cm in diameter and a piece of wood in basal foot; medium bluish gray (5*B* 5/1) 81–85

Eastover Formation

Sand, fine, well-sorted, clean, olive gray (5*Y* 4/1) 85–86

Base of upper Bacons Castle Formation: **+59 feet above sea level**
Base of Chowan River Formation: **+29 feet above sea level**
Base of Yorktown Formation (zone 2): **+25 feet above sea level**

Bottomed in Eastover Formation

MV–93–3: Along dirt road (not on map) crossing abandoned channel of the Meherrin River, 0.22 mile north of eastern end of Branches Bridge, in southeastern 1/9th of map area (latitude 36.5355° N., longitude 77.2610° W.). Surface elevation about 27 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Silt, clayey, sandy (very fine to fine), micaceous; layer of light gray (*N* 7) calcite(?) lumps present at 3 feet; yellowish gray (5*Y* 7/2) with streaks of dark yellowish orange (10*YR* 6/6); reddish brown blotches (10*R* 4/6) present in basal foot	0–6
Silt, clayey, sandy (very fine to fine), micaceous; rounded quartz pebbles up to 3 cm in diameter present in basal 6 inches; brownish gray (5*YR* 4/1)	6–9
Yorktown Formation (zone 1)	
Sand, fine; phosphate sand abundant; shelly; contains calcite-cemented lumps; greenish gray (5*GY* 5/1)	9–11
Eastover Formation	
Sand, dominantly fine but with minor medium to coarse fraction, grading down to fine to medium and better sorted, clayey, silty sand; *Mercenaria* shells present below 23 feet; dark greenish gray (5*G* 4/1)	11–26

Base of alluvium: **+18 feet above sea level**
Base of Yorktown Formation (zone 1): **+16 feet above sea level**

Bottomed in Eastover Formation

MV–93–4: 0.05 mile south of power line and 0.05 mile north of unnumbered N.C. State Road, along eastern edge of field next to wooded area, 0.25 mile east of western quadrangle border, in southwestern 1/9th of map area (latitude 36.5326° N., longitude 77.3701° W.). Surface elevation about 80 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine to fine, silty, yellowish gray (5*Y* 7/3) grading down to dark yellowish orange (10*YR* 6/6)	0–1
Sand, very fine to fine, silty, stiff, reddish orange (10*R* 5/6) with dark yellowish orange (10*YR* 6/6) blotches	1–6
Sand, fine grading, down to medium to coarse, silty sand; sparse quartz pebbles present; reddish orange (10*R* 5/6) with dark yellowish orange (10*YR* 6/6) blotches	6–12
Sand, dominantly medium, poorly sorted, grading down to medium to coarse sand; sparse dark fine heavy mineral grains present; dark yellowish orange (10*YR* 6/6)	12–20
Chowan River Formation	
Silt, clayey, sandy (very fine), yellowish gray (5*Y* 7/2); lower contact somewhat gradational	20–24
Sand, fine, well-sorted, silty and clayey in upper 2 feet, medium bluish gray (5*B* 5/1) grading down to dark bluish gray (5*B* 4/1)	24–35
Silt, sandy (very fine), medium bluish gray (5*B* 6/1)	35–36
Sand, very fine, clayey, abundant shell fragments, angular to rounded; indurated subrounded sandstone clast 3 cm in diameter present; medium bluish gray (5*B* 6/1)	36–38
Yorktown Formation (zone 2)	
Silt, sandy (very fine); contains lenses of very fine sand; burrows filled with fine to medium sand in upper 6 feet; medium bluish gray (5*B* 6/1)	38–56
Silt, sandy (very fine to fine), sparsely shelly, medium bluish gray (5*B* 6/1)	56–62

Eastover Formation

Sand, fine, well-sorted with a scattering of well-rounded coarse grains, dark greenish gray (10*GY* 4/1); lower contact somewhat gradational 62–66

Sand, medium to coarse; contains abundant rounded quartz pebbles up to 2.5 cm in diameter; dark greenish gray (10*GY* 4/1) 66–67

Clubhouse Formation

Sand, medium, light gray (*N* 7)..... 67–68

Silt, very clayey, silty, micaceous, lignitic, brownish gray (5*YR* 4/1); lower contact gradational 68–71

Silt, very clayey; rounded indurated clay balls up to 5 cm in diameter on basal contact; brownish gray (5*YR* 3/1); lower contact abrupt 71–74

Silt, very clayey, micaceous, dense, medium gray (*N* 5), grading down to sand that is fine, silty, micaceous, and greenish gray (5*GY* 5/1) with wisps of olive brown (5*Y* 5/4)..... 74–76

Base of upper Bacons Castle Formation:	**+60 feet above sea level**
Base of Chowan River Formation:	**+42 feet above sea level**
Base of Yorktown Formation (zone 2):	**+18 feet above sea level**
Base of Eastover Formation:	**+13 feet above sea level**

Bottomed in Clubhouse Formation

MV–93–5: On southeastern side of Va. State Road 665, 0.85 mile west of eastern quadrangle border, in northeastern 1/9th of map area (latitude 36.6045° N., longitude 77.2634° W.). Surface elevation 60 feet.

LITHOLOGY	DEPTH IN FEET
Chuckatuck Formation	
Sand, fine, finely micaceous; contains sparse scattered quartz granules; grayish orange (10*YR* 7/4)	0–1
Sand, medium to coarse, poorly sorted, angular, silty, clayey, orange (5*YR* 6/7)	1–6
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), finely micaceous, brown (5*YR* 5/6) with streaks of very pale orange (10*YR* 8/2) grading down to light gray (*N* 6) with splotches of brown (5*YR* 5/6)	6–16
Silt, clayey, sandy (very fine), finely micaceous; *Mulinia* shells present below 23 feet; medium bluish gray (5*B* 5/1)	16–33
Sand, very fine to fine, silty, clayey; contains quartz pebble 2 cm in length; calcite-cemented lumps and shell hash abundant; medium bluish gray (5*B* 5/1)	33–34
Yorktown Formation (zone 1)	
Sand, fine, grading down to fine to medium sand in basal foot; contains phosphate sand and abundant calcite-cemented lumps; shelly, medium bluish greenish gray (5*BG* 5/1) grading down to medium greenish gray (5*G* 6/1)	34–39
Eastover Formation	
Sand, fine, well-sorted; contains sparse shell fragments; dark greenish gray (5*G* 4/1); lower contact somewhat gradational	39–52
Sand, fine to medium, shelly (including *Chesapecten*); 3-inch-thick bed of subrounded to rounded quartz pebbles up to 3 cm in diameter at base; dark greenish gray (5*G* 4/1)	52–54
Clubhouse Formation	
Silt, very clayey, dense; very tough drilling; reddish brown (10*R* 4/6)	54–56

Base of Chuckatuck Formation:	**+54 feet above sea level**
Base of Yorktown Formation (zone 2):	**+26 feet above sea level**
Base of Yorktown Formation (zone 1):	**+21 feet above sea level**
Base of Eastover Formation:	**+ 6 feet above sea level**

Bottomed in Clubhouse Formation

MV–93–6: On eastern side of Va. State Road 723 in driveway to abandoned house near 103-foot spot elevation, 0.62 mile west-southwest of intersection of Va. State Route 665 and Va. State Route 663, in north-central 1/9th of map area (latitude 36.6015° N., longitude 77.2994° W.). Surface elevation 104 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, fine to medium, poorly sorted, silty, very pale orange (10*YR* 8/2) grading down to dark yellowish orange (10*YR* 6/6)	0–1
Sand, medium to coarse, poorly sorted, granular, clayey, silty, stiff, orange (5*YR* 7/8)	1–6
Sand, medium to coarse, better sorted than overlying sands, granular, silty, orange (5*YR* 6/6)	6–11
Sand, medium to coarse, poorly sorted, angular, orange (5*YR* 6/6); contains subangular to subrounded quartz pebbles up to 1 cm in diameter at 14–16 feet; dark yellowish orange (10*YR* 6/6) clay lens or large clay ball at 15 feet	11–17
Silt, very clayey, sandy (very fine); quartz granules and quartz pebbles 0.5 cm in diameter on basal contact; very light gray (*N* 8)	17–19
Chowan River Formation	
Sand, fine to medium, moderately well-sorted, grading down to fine, well-sorted, silty sand; contains scattered grains of very fine dark heavy minerals; reddish brown (10*R* 5/7) grading through red (5*R* 5/6) and through dark yellowish orange (10*YR* 6/6) to light red (5*R* 6/6)	19–25
Yorktown Formation (zone 2)	
Silt, very clayey, light red (5*R* 6/6) grading down rapidly to dark yellowish orange (10*YR* 6/6)	25–26
Silt, clayey, sandy (very fine), very light gray (*N* 8) with red (10*R* 5/6) blotches; 0.5-inch-thick, dark reddish brown (10*R* 3/4) ironstone bed at 40 feet	26–41

Silt, clayey, sandy (very fine), with lenses of very fine to fine sand scattered within; *Mulinia* shells abundant from 48 to 51 feet; medium bluish gray (5*B* 5/1) 41–51

Base of upper Bacons Castle Formation: **+85 feet above sea level**
Base of Chowan River Formation: **+79 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

Purdy Quadrangle

PU–93–1: On northern side of Va. State Road 614, 0.1 mile west of bridge over Otterdam Swamp, in east-central 1/9th of map area (latitude 36.7946° N., longitude 77.5087° W.). Surface elevation 114 feet.

LITHOLOGY	DEPTH IN FEET
Artificial fill; sand, very fine to fine, clayey	0–2
Alluvium	
Sand, fine to coarse; contains sparse very fine dark heavy mineral grains; silty, loose, yellowish gray (5*Y* 7/2)	2–5
Chowan River Formation	
Sand, fine to medium, grading down rapidly to very fine to fine sand with a minor medium fraction; clayey, dense, grayish orange (10*YR* 7/4)	5–6
Sand, very fine to very coarse; contains subrounded quartz pebbles up to 2 cm in diameter; medium bluish gray (5*B* 6/1)	6–9
Carolina slate belt rocks	
Refusal; ripped-up fragments of greenish metabasalt	at 9

Base of alluvium: **+109 feet above sea level**
Base of Chowan River Formation: **+105 feet above sea level**

Bottomed on Carolina slate belt rocks

PU–93–2: On southern side of Va. State Road 610, 0.4 mile west of eastern quadrangle border, in east-central 1/9th of map area (latitude 36.8049° N., longitude 77.5068° W.). Surface elevation 155 feet.

LITHOLOGY — DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, very fine to coarse, clayey, silty; clay content increases downward; light brown (5*YR* 6/6) 0–6

Silt, very clayey, sandy (very fine to medium), very light gray (*N* 8) with streaks of moderate red (5*R* 4/6), light red (5*R* 6/6), and dark yellowish orange (10*YR* 6/6) 6–14

Silt, very clayey, sandy (very fine to medium), very light gray (*N* 8) 14–17

Sand, fine to very coarse, subangular to subrounded; contains quartz pebbles up to 2 cm in diameter; white (*N* 9) and dark yellowish orange (10*YR* 6/6) 17–18

Chowan River Formation

Silt, very clayey, sandy (fine), yellowish gray (5*Y* 8/1); lower contact gradational 18–19

Sand, fine to medium, grading rapidly down to fine to very coarse sand; subangular to subrounded quartz pebbles up to 3 cm in diameter abundant; grayish yellow (5*Y* 8/4) with streaks of black (*N* 1) (graphite?) 19–24

Yorktown Formation (zone 3)

Silt, very clayey, pale yellowish brown (10*YR* 6/2) grading down to grayish yellow (5*Y* 8/4), interbedded with thin lenses of dark yellowish orange (10*YR* 6/6), very fine sand 24–26

Sand, very fine to fine; contains rounded wood fragment 2 cm in diameter; light gray (*N* 7); lower contact somewhat gradational 26–27

Sand, medium to very coarse, medium gray (*N* 5) 27–28

Yorktown Formation (zone 2)

Silt, very clayey, greasy texture; scattered medium to very coarse grains at base; medium gray (*N* 5)..... 28–29

Carolina slate belt rocks(?)

No recovery; total refusal, even with carbide bit..... at 29

Base of lower Bacons Castle Formation:	**+137 feet above sea level**
Base of Chowan River Formation:	**+131 feet above sea level**
Base of Yorktown Formation (zone 3):	**+127 feet above sea level**
Base of Yorktown Formation (zone 2):	**+126 feet above sea level**

Bottomed on Carolina slate belt rocks(?)

PU–06–3: At entrance to dirt road on southern side of Va. State Road 608, 0.95 mile west of eastern quadrangle border, in east-central 1/9th of map area (latitude 36.8270° N., longitude 77.5163° W.). Surface elevation 160 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine to fine, clayey, silty, dark yellowish brown (10*YR* 4/2) grading down to dark olive brown (5*Y* 5/4)	0–1
Sand, very fine to fine with scattered angular medium grains, clayey, silty, dark yellowish orange (10*YR* 6/6); lower contact somewhat gradational	1–7
Silt, very clayey, sandy (very fine to fine), stiff, dense, light reddish brown (10*R* 5/6) with yellowish gray (5*Y* 8/1) mottles	7–15
Sand, very fine to coarse, angular to subangular, poorly sorted, silty, clayey, stiff, pale yellowish gray (5*Y* 8/2) grading down to yellowish orange (10*YR* 7/6)	15–17
Felsic Carolina slate belt rocks	
Saprolite, sand, very fine to fine; contains scattered, ovoid, very polished quartz pebbles up to 1 cm in length (burrow-fill clasts?); bright orange (10*YR* 6/8); lower contact gradational	17–25
Saprolite, silt, sandy (very fine), yellowish orange (10*YR* 7/6) grading down through light brown (5*YR* 6/6) to dusky yellow (5*Y* 6/6) with clots of black (*N*1) and moderate red (5*R* 4/6)	25–32
Refusal; bit would penetrate no farther	at 32

Base of lower Bacons Castle Formation: **+143 feet above sea level**

Bottomed on felsic Carolina slate belt rocks

PU–06–4: At entrance to dirt road on northern side of Va. State Road 608, 1.30 mile west of eastern quadrangle border, in east-central 1/9th of map area (latitude 36.8288° N., longitude 77.5232° W.). Surface elevation 162 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine to medium, silty, dusky yellow (5*Y* 6/4)	0–1
Sand, fine to coarse, poorly sorted, silty, clayey, dense, dark yellowish orange (10*YR* 6/6) grading down to grayish orange (10*YR* 7/4)	1–7
Sand, fine to coarse, poorly sorted, silty, clayey; contains rare subangular to subrounded quartz granules and pebbles up to 1 cm in diameter; very light gray (*N* 8)	7–11
Sand, fine to very coarse, very poorly sorted, angular to subangular, silty; contains rare subangular quartz pebbles up to 0.5 cm in diameter; medium grayish yellow (5*Y* 7/4) grading through light orange (10*YR* 7/8) (13–14) and through pinkish gray (5*YR* 8/2) (14–15) to pale orangish pink (10*R* 8/4) with a streak of grayish brown (5*YR* 3/2); lower contact somewhat gradational	11–17
Sand, medium, well-sorted, silty, pale orangish pink (10*R* 8/4)	17–18
Felsic Carolina slate belt rocks	
Saprolite, silt, yellowish orange (10*YR* 7/6) grading down to dark yellowish orange (10*YR* 6/6)	18–21

Base of lower Bacons Castle Formation: **+144 feet above sea level**

Bottomed in saprolite from felsic Carolina slate belt rocks

PU–06–5: At home site on southern side of Va. State Road 608, 0.05 mile west of eastern quadrangle border, in east-central 1/9th of map area (latitude 36.8202° N., longitude 77.5010° W.). Surface elevation 163 feet.

LITHOLOGY — DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, very fine, silty, clayey, light olive (5*Y* 5/2) grading down to yellowish orange (10*YR* 7/6)..... 0–1

Silt, sandy (very fine), clayey, stiff, tough, dark grayish orange (10*YR* 6/4) grading through yellowish brown (10*YR* 5/2) (2–3) to light olive gray (5*Y* 6/1) with moderate reddish brown (10*R* 4/6) mottles..... 1–7

Sand, very fine to fine, silty, clayey; sand content increases downward; yellowish gray (5*Y* 7/2) grading through pale orange (10*YR* 7/2) (7.5–8.5 feet) and pinkish gray (5*YR* 8/1) (8.5–9 feet) to pale grayish orange (10*YR* 8/4)..... 7–15

Sand, dominantly fine but very fine to medium, silty, very pale orange (10*YR* 8/2); lower contact gradational 15–21

Sand, medium to coarse, grading down to medium to very Coarse sand; subangular quartz granules present; yellowish gray (5*Y* 8/1) grading down to pale grayish orange (10*YR* 8/4) in basal foot..... 21–26

Chowan River Formation

Sand, very fine, silty, slightly clayey, dark yellowish orange (10*YR* 6/6) in upper 3 inches, then yellowish gray (5Y 7/2); lower contact gradational..... 26–28

Sand, very fine to fine, silty, yellowish gray (5*Y* 8/1) 28–33

Yorktown Formation (zone 2)

Silt, very clayey, sandy (very fine), medium greenish gray (5*GY* 5/1); lower contact gradational..... 33–42

Sand, very fine, silty, clayey; sparse shell chips present; dark greenish gray (5*GY* 4/1); lower contact gradational 42–43

Sand, medium to very coarse, silty; sparse shell chips present;
light olive gray (5*Y* 6/1) grading down to medium gray (*N* 5) 43–48

Eastover Formation

Sand, fine, well-sorted, medium olive gray (5*Y* 5/1) grading
down to grayish brown (5*YR* 3/2) 48–50

Sand, fine to medium rapidly grading down to medium to
very coarse, subangular to subrounded, slightly silty, soft;
light orange (10*YR* 7/8) grading rapidly down to dark
yellowish orange (10*YR* 5/6)..... 50–55

Granite

Saprolite, silt, clayey; contains floating grains of very coarse,
dark gray, angular quartz; slightly micaceous, light greenish
gray (5*G* 7/1)..... at 55

Base of lower Bacons Castle Formation: **+137 feet above sea level**
Base of Chowan River Formation: **+130 feet above sea level**
Base of Yorktown Formation (zone 2): **+115 feet above sea level**
Base of Eastover Formation: **+108 feet above sea level**

Bottomed in saprolite from granite

Sebrell Quadrangle

SE–93–1: On northwestern side of Va. State Road 631 at entrance to dirt road, 0.41 mile southwest of western end of Peters Bridge, in north-central 1/9th of map area (latitude 36.8554° N., longitude 77.1958° W.). Surface elevation 45 feet.

LITHOLOGY	DEPTH IN FEET
Artificial fill; sand, poorly sorted, loose, yellowish gray (5*Y* 7/2)	0–1
Windsor Formation	
Sand, very fine to fine, silty, finely micaceous, dark yellowish orange (10*YR* 6/6) with light gray (*N* 7) mottles	1–5
Silt, very clayey, sandy (very fine to fine), micaceous, light gray (*N* 7)	5–7
Sand, fine to medium, grading rapidly down to very fine to very coarse sand; micaceous; contains very fine to fine dark heavy mineral grains, subrounded quartz pebbles up to 1 cm in diameter, and calcite-cemented lumps up to 4 cm in diameter reworked from underlying sand layer; yellowish gray (5*Y* 7/2)	7–12
Yorktown Formation (zone 1)	
Sand, very fine to fine, shelly; contains calcite-cemented lumps up to 4 cm in diameter; greenish gray (5*G* 5/1)	12–15
Sand, very fine to fine, shelly, grayish olive green (5*GY* 3/2)	15–22
Sand, fine to very coarse, shelly; contains subrounded to rounded quartz pebbles up to 2 cm in diameter on basal contact; grayish olive green (5*GY* 3/2)	22–24
Eastover Formation	
Sand, very fine to fine, silty, clayey, sparsely micaceous; quartz pebbles 1–2 cm in diameter scattered throughout; dark bluish gray (5*B* 4/1)	24–27
Gravel containing subrounded to rounded quartz pebbles up to 5 cm in diameter, in clay-rich matrix with medium to very coarse sand grains, dark bluish gray (5*B* 4/1)	27–31

Patuxent Formation

Sand, medium to very coarse; contains sparse very fine to fine grains of dark heavy minerals; micaceous, garnetiferous; polished quartz granules and small pebbles up to 0.5 cm in diameter present; brownish gray (5*YR* 5/1) 31–36

Base of Windsor Formation: **+33 feet above sea level**
Base of Yorktown Formation (zone 1): **+21 feet above sea level**
Base of Eastover Formation: **+14 feet above sea level**

Bottomed in Patuxent Formation

SE–93–2: Along dirt road north-northwest of Gaging Station, 0.18 mile north-northwest of western end of Careys Bridge, along border between southeastern and south-central 1/9th of map area (latitude 36.7707° N., longitude 77.1665° W.). Surface elevation about 30 feet.

LITHOLOGY	DEPTH IN FEET
Shirley Formation	
Sand, dominantly very fine to fine with minor medium to very coarse fraction; scattered grains of very fine to fine dark heavy minerals; a few quartz pebbles up to 1 cm in diameter present; yellowish brown (10*YR* 6/4)	0–6
Sand, dominantly very fine to fine with minor medium to very coarse fraction; scattered grains of very fine to fine dark heavy minerals; a few quartz pebbles up to 1 cm in diameter present; micaceous, olive gray (5*Y* 4/2) grading down through dark greenish gray (5*GY* 3/1) to grayish olive (10*Y* 4/2)	6–13
Sand, very fine to fine, very micaceous with flakes up to 2 mm, moderate yellowish brown (10*YR* 5/4) grading down to light olive gray (5*Y* 6/2)	13–22
Sand, very fine to fine, well-sorted; very fine dark heavy mineral grains present; micaceous; round mud balls up to 1 cm in diameter in basal foot; light gray (*N* 6) grading down to medium dark gray (*N* 4)	22–30
St. Marys Formation	
Sand, very fine, clayey, silty, micaceous, dark gray (*N* 3) in top inch and then light bluish gray (5*B* 7/1); lower contact gradational	30–34
Silt, very clayey, stiff, lumpy, greenish gray (5*G* 6/1) to dark greenish gray (5*G* 5/1) grading down through dark yellowish brown (10*YR* 4/2) (36–48 feet) to dark olive gray (5*Y* 3/1) and micaceous	34–55
Patuxent Formation	
Sand, very fine to fine, silty; silvery mica abundant; medium light gray (*N* 6) grading down to light gray (*N* 7); lower contact somewhat gradational	55–68
Sand, fine to medium, silty; silvery mica abundant; light gray (*N* 7); lower contact somewhat gradational	68–70

Sand, very fine to very coarse, very poorly sorted, clayey and silty matrix; contains abundant polished quartz pebbles up to 1 cm in diameter and a carbonized wood fragment; medium dark gray (*N* 4) 70–71

Base of Shirley Formation: **0 feet at sea level**
Base of St. Marys Formation: **-25 feet above sea level**

Bottomed in Patuxent Formation

Skippers Quadrangle

SK–94–1: On southern side of Va. State Road 621, 0.54 mile west of Diamond Grove Church, in northwestern 1/9th of map area (latitude 36.5953° N., longitude 77.5937° W.). Surface elevation 150 feet.

LITHOLOGY — DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, fine to coarse, poorly sorted, with quartz granules; loose to firm downward; variegated dark yellow brown (10*YR* 6/8), red (10*R* 5/6), and light gray (*N* 7) 0–5

Sand, very fine to medium with quartz granules and pebbles up to 1.0 cm in diameter, silt and clay fraction, stiff, variegated grayish orange (5*YR* 6/2) and yellow (5*Y* 8/4) 5–18

Chowan River Formation

Silt, clayey; very fine to fine sand, grading down to very fine to medium sand; finely micaceous, grayish orange (10*YR* 7/4) 18–25

Sand, medium to coarse, grading down to coarse to very coarse; angular to subangular; pebbly with subrounded to subangular pebbles up to 3.0 cm in diameter, fraction discoidal, fraction silty clay clasts; variegated pale orange (10*YR* 9/2) and brownish gray (5*YR* 4/1) 25–33

Granite

Saprolite from granite, quartz-rich, angular, brown (7.5*YR* 5/8) 33–35

Base of lower Bacons Castle Formation: **+132 feet above sea level**
Base of Chowan River Formation: **+117 feet above sea level**

Bottomed in saprolite from granite

SK–94–2: Along dirt road (not on map), 0.84 mile east of western quadrangle border and 2.03 miles south of northern quadrangle border, in northwestern 1/9th of map area (latitude 36.5956° N., longitude 77.6099° W.). Surface elevation about 152 feet.

LITHOLOGY	DEPTH IN FEET
Road gravel	0–1
Chowan River Formation	
Sand, medium to very coarse, angular; contains pebbles up to 2.0 cm in diameter; light gray (*N* 8)	1–6
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), finely micaceous; very fine sand lenses; variegated and blotched orange (5*YR* 7/8), dark yellowish orange (10*YR* 6/6), and light gray (*N* 7)	6–13
Sand, fine, silty, clayey, micaceous, shelly with chips of *Chesapecten* and other shells, bluish gray (5*B* 5/1)	13–17
Granite	
Refusal, presumably granite similar to local outcrops	at 17

Base of Chowan River Formation: **+146 feet above sea level**
Base of Yorktown Formation (zone 2): **+135 feet above sea level**

Bottomed on granite

SK–94–3: South of Va. State Road 621 along dirt road, 0.02 mile east of western quadrangle border and 1.68 miles south of northern quadrangle border, in northwestern 1/9th of map area (latitude 36.6006° N., longitude 77.6243° W). Surface elevation about 185 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, very fine to medium, well-sorted; abundant mica; loose to firm downward; variegated dark yellowish orange (10*YR* 5/6), reddish brown (10*YR* 4/6), and pale orange (10*YR* 8/2)	0–7
Yorktown Formation (zone 3)	
Sand, fine to coarse, unsorted, clay and silt fraction; gravel and pebbles, some discoid; loose but crunchy, dark yellowish orange (10*YR* 5/6)	7–10
Granite	
Saprolite from granite, quartz-rich, remnant feldspar grains, angular; loose to firm downward; dark yellowish orange (10*YR* 6/6); refusal at base	10–20

Base of Chowan River Formation: **+178 feet above sea level**
Base of Yorktown Formation (zone 3): **+175 feet above sea level**

Bottomed in saprolite from granite

SK–94–4: On western side of U.S. Highway 301 at entrance to dirt road, 0.79 mile southwest of Corinth Church, in north-central 1/9th of map area (latitude 36.5857° N., longitude 77.5421° W.). Surface elevation about 115 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, fine to very coarse, dominantly medium, unsorted, firm, orange (5*YR* 5/8)	0–10
Sand, fine to very coarse; clay and silt fraction; very stiff, variegated dark yellowish orange (10*YR* 6/6), light gray (*N* 7), orange (5*YR* 5/8), and moderate red (5*R* 6/4)	10–11
Sand, fine to very coarse, unsorted; gravel and pebbles up to 3 cm in diameter; clay and silt matrix increases downward; firm to stiff downward, dark yellowish orange (10*YR* 6/6)	11–18
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine to very coarse, unsorted; gravel and pebbles up to 3 cm in diameter; clay and silt matrix; stiff to loose downward, variegated light red (5*R* 5/6), white (*N* 10), and black (*N* 1)	18–25
Chowan River Formation	
Sand, medium to coarse, moderately sorted; sparse pebbles; fine mica; abundant heavy minerals in scattered layers; clay clasts near 35 feet; pale yellowish orange (10*YR* 8/6)	25–44
Yorktown Formation (zone 2)	
Clay and silt; sparse mica; bluish gray (5*B* 5/1)	44–46
Sand, very fine to medium; abundant pebbles up to 3 cm in diameter; silt and clay fraction; shell fragments; bluish gray (5*B* 5/1)	46–48
Carolina slate belt rocks	
Saprolite, clay, firm, grayish bluish green (5*BG* 5/2)	48–49

Base of Windsor Formation:	**+97 feet above sea level**
Base of lower Bacons Castle Formation:	**+90 feet above sea level**
Base of Chowan River Formation:	**+71 feet above sea level**
Base of Yorktown Formation (zone 2):	**+67 feet above sea level**

Bottomed in saprolite from Carolina slate belt rocks

SK–94–5: On southeastern side of Va. State Road 632, 0.68 mile southwest of Mitchells Mill, in north-central 1/9th of map area (latitude 36.5877° N., longitude 77.5783° W.). Surface elevation about 130 feet.

LITHOLOGY DEPTH IN FEET

Upper Bacons Castle Formation (Bahramsville Member)

Sand, very fine to very coarse; clay and silt fraction; sparse granules; stiff, variegated dark yellowish orange (10*YR* 6/6), light gray (*N* 7), and orange (5*YR* 5/7) 0–6

Sand, very fine to very coarse; increased clay and silt fraction; sparse granules; stiff, variegated light red (5*R* 5/6) and light gray (*N* 7) 6–10

Chowan River Formation

Sand, fine to medium, well-sorted, subrounded to subangular; heavy minerals common; loose, dark yellowish orange (10*YR* 6/6) 10–16

Sand, medium to very coarse, subangular to angular, dark yellowish orange (10*YR* 6/6) 16–18

Yorktown Formation (zone 2)

Silt and clay; sparse fine mica; sparse pebbles at base; dusky yellow (5*Y* 6/4) 18–23

Granite

Saprolite from granite, angular quartz, relict feldspar, mica, dark yellowish brown (10*YR* 4/2) 23–24

Base of upper Bacons Castle Formation: +120 feet above sea level
Base of Chowan River Formation: +112 feet above sea level
Base of Yorktown Formation (zone 2): +107 feet above sea level

Bottomed in saprolite from granite

SK–94–6: In field between Interstate 95 and U.S. Highway 301, 2.91 miles west of eastern quadrangle border and 2.12 miles south of northern quadrangle border, in north-central 1/9th of map area (latitude 36.5945° N., longitude 77.5521° W.). Surface elevation about 112 feet.

LITHOLOGY DEPTH IN FEET

Aeolian dune sands

Sand, fine to medium, moderately sorted; sparse granules pale yellowish orange (10*YR* 7/2) grading down to dark yellowish orange (10*YR* 6/7) 0–4

Upper Bacons Castle Formation (Bahramsville Member)

Silt and clay, firm, variegated yellowish gray (5*Y* 8/1) with light red (5*R* 5/6) and reddish brown (10*YR* 4/6) mottles; grades downward to very fine sand, silt, and clay; abundant mica; sparse heavy minerals; greenish gray (5*G* 5/1) 4–22

Sand, very fine; silt and clay; abundant mica; sparse heavy minerals; iron pebbles (plinthites) at base, firm; variegated dark yellowish orange (10*YR* 6/6) and orange (5*YR* 5/8) 22–23

Chowan River Formation

Sand, fine, grading down to medium, well sorted, subrounded to subangular sand; mica and heavy minerals abundant; relict feldspar; loose, variegated dark yellowish orange (10*YR* 6/6) and very pale orange (10*YR* 8/2) 23–31

Yorktown Formation (zone 2)

Silt and clay; sparse very fine sand, mica, and heavy minerals; uncommon pebbles up to 2 cm in diameter; moderately firm, bluish gray (5*B* 5/1) 31–37

Silt and clay; sparse very fine sand, mica, and heavy minerals; common pebbles up to 2 cm in diameter; contains fragments of *Chesapecten*, *Mulinia*, and vertebrate bones; firm, dark bluish greenish gray (5*BG* 4/1) 37–42

Granite

Saprolite from granite, angular quartz, relict feldspar, mica, pale blue (5*B* 6/2) 42–44

Base of upper Bacons Castle Formation: **+89 feet above sea level**
Base of Chowan River Formation: **+81 feet above sea level**
Base of Yorktown Formation (zone 2): **+70 feet above sea level**

Bottomed in saprolite from granite

SK–94–7: On southern edge of field, 2.73 miles west of eastern quadrangle border and 1.70 miles south of northern quadrangle border, in north-central 1/9th of map area (latitude 36.5993° N., longitude 77.5486° W.). Surface elevation about 140 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, medium; pebbles up to 1.0 cm in diameter; abundant silt and clay; poorly sorted, stiff, variegated with mottles of pale yellowish orange (10*YR* 8/6), orange (5*YR* 5/8), moderate red (5*R* 4/6), and light gray (*N* 7)	0–14
Sand, fine, well-sorted; sparse heavy minerals; common clay clasts toward base; moderately loose, yellowish orange (5*YR* 6/6)	14–28
Sand, medium to very coarse; rounded to subangular pebbles up to 1.5 cm in diameter; interbedded silt and clay layers; poorly sorted, stiff, variegated moderate orange pink (5*YR* 8/4) and white (*N* 10)	28–36
Base of Chowan River Formation(?)	
Silt and clay and fine sand, firm, light gray (*N* 7)	36–37
Sand, fine, grading down to medium; well sorted; common coarse mica and heavy minerals; loose, moderate pink (5*R* 7/4) to moderate yellowish brown (10*YR* 5/4)	37–56
Yorktown Formation (zone 2)	
Silt and clay and fine sand, micaceous; shell fragments common; bluish gray (5*B* 5/1)	56–61
Bedrock	
Unknown bedrock; refusal	at 61

Base of lower Bacons Castle Formation:	**+104 feet above sea level**
Base of Chowan River Formation:	**+84 feet above sea level**
Base of Yorktown Formation (zone 2):	**+79 feet above sea level**

Bottomed on unknown bedrock

SK–94–8: Along dirt road (not shown on map), 0.15 mile south-southeast of intersection of Interstate Highway 95 and Va. State Road 629, in north-central 1/9th of map area (latitude 36.6050° N., longitude 77.5617° W.). Surface elevation about 108 feet.

LITHOLOGY	DEPTH IN FEET
Artificial fill, gravel	0–5
Windsor Formation	
Sand, fine to very coarse, grading down to fine; silt and clay fraction; clay clasts; granules and pebbles up to 2 cm in diameter that are rounded to subangular; uncommon discoidal quartz and feldspar; loose, variegated very pale orange (10*YR* 8/2), light brown (5*YR* 6/4), and dusky brown (5*YR* 2/2)	5–18
Yorktown Formation (zone 2)	
Silt and clay and fine sand; sparse pebbles up to 1 cm in diameter that grade down to 6 cm in diamater near base; moderately firm; abundant shell fragments (*Turritella*); greenish gray (5*G* 5/1)	18–36
Sand, coarse to very coarse; clay; pebbles up to 2 cm in diameter, rounded and spherical; stiff, light gray (*N* 7)	36–49
Sand, medium; clay; pebbles up to 1 cm in diameter; loose, light gray (*N* 7)	49–50
Patuxent Formation	
Sand, coarse to very coarse; clay; pebbles up to 2 cm in diameter, rounded and spherical; stiff, light gray (*N* 7)	50–52
Clay and silt, stiff, medium gray (*N* 5)	52–54
Granite	
Saprolite from granite, angular quartz, relict feldspar, mica, pale blue (5*B* 6/2)	54–66

Base of Windsor Formation:	**+90 feet above sea level**
Base of Yorktown Formation (zone 2):	**+58 feet above sea level**
Base of Patuxent Formation:	**+54 feet above sea level**

Bottomed in saprolite from granite

SK–94–9: On western side of power line, 0.10 mile southwest of intersection of Interstate Highway 95 and Va. State Road 629, in north-central 1/9th of map area (latitude 36.6046° N., longitude 77.5654° W.). Surface elevation about 110 feet.

LITHOLOGY	DEPTH IN FEET
Artificial fill, pebbly mud	0–6
Windsor Formation	
Silt and clay, stiff to firm, yellowish gray (5*Y* 8/1)	5–10
Sand, fine to medium, well-sorted, loose, light gray (*N* 7)	10–16
Yorktown Formation (zone 2)	
Clay and silt and minor sand; gravel and fossil fragments grading down to abundant sand and pebbles (up to 6 cm in diameter), common pectenids, *Mulinia*, *Turritella*, oysters, vertebrate bone fragments, and phosphate nodules; firm, bluish gray (5*B* 5/1).	16–25
Granite	
Saprolite from granite, angular quartz, relict feldspar, mica, light greenish gray (5*GY* 8/1)	25–28

Base of Windsor Formation: **+94 feet above sea level**
Base of Yorktown Formation (zone 2): **+85 feet above sea level**

Bottomed in saprolite from granite

SK–94–10: Along dirt road, 0.12 mile south of Va. State Route 625, 0.78 mile west of eastern border of quadrangle, in east-central 1/9th of map area (latitude 36.5711° N., longitude 77.5137° W.). Surface elevation about 75 feet.

LITHOLOGY DEPTH IN FEET

Alluvium

Sand, medium, humic-rich, dark yellowish brown (10*YR* 4/2).....0–2

Sand, poorly sorted; clay and silt to pebble; coarsening downward; carbonaceous fragments; firm, variegated pale orange (10*YR* 7/2), light gray (*N* 7), dark yellowish orange (10*YR* 6/6), and dark yellowish brown (10*YR* 4/2).....2–8

Sand, fine to coarse, moderately sorted, grading down to medium to coarse; pebbly (up to 4 cm in diameter), firm, yellowish gray (5*Y* 8/1).....8–14

Patuxent Formation

Sand, medium to coarse with silt and clay; abundant mica; clay balls; sparse garnets; stiff, light greenish gray (5*GY* 8/1) 14–18

Base of alluvium: **+61 feet above sea level**

Bottomed in Patuxent Formation

SK–94–11: On northern side of Va. State Road 632, 0.05 mile east of western quadrangle border, in west-central 1/9th of map area (latitude 36.5704° N., longitude 77.6239° W.). Surface elevation about 180 feet.

LITHOLOGY	DEPTH IN FEET
Chowan River Formation	
Sand, fine, humic, loose, brown (7.5*YR* 5/8)	0–2
Sand, fine, moderately sorted; contains sparse clay and silt laminations; sparse mica and heavy minerals; discoidal pebble (1 cm) at base; stiff, variegated very pale orange (10*YR* 8/2) and yellowish orange (10*YR* 6/7)	2–10
Sand, very fine to medium, moderately sorted; sparse mica; abundant heavy minerals; discoidal pebbles up to 2 cm in diameter at base; stiff, variegated very pale orange (10*YR* 8/2) and yellowish orange (10*YR* 6/7)	10–15
Yorktown Formation (zone 3?)	
Silt and clay, very stiff, dark yellowish orange (10*YR* 6/6)	15–16
Sand, fine, well-sorted; sparse mica; abundant heavy minerals; firm, yellowish orange (10*YR* 7/5)	16–20
Sand, fine to coarse, moderately sorted; sparse mica; abundant heavy minerals; firm, yellowish orange (10*YR* 7/5)	20–22
Sand, fine, well-sorted; sparse rounded pebbles (1 cm); sparse mica; abundant heavy minerals; firm, yellowish orange (10*YR* 7/5)	22–36
Yorktown Formation (zone 2?)	
Silt and clay and very fine sand and common pebbles (3 cm), firm, orange (5*YR* 5/7)	36–37
Granite	
Saprolite from granite, angular quartz, relict feldspar, mica, very stiff, pale blue (5*B* 6/2)	37–39

Base of Chowan River Formation: **+165 feet above sea level**
Base of Yorktown Formation (zone 3?): **+144 feet above sea level**
Base of Yorktown Formation (zone 2?): **+143 feet above sea level**

Bottomed in saprolite from granite

SK–94–12: Along edge of field, 0.05 mile southwest of Va. State Road 621, 1.2 miles east of western quadrangle border, in northwestern 1/9th of map area (latitude 36.5969° N., longitude 77.6033° W.). Surface elevation about 160 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine to very coarse; sparse granules; silt and clay; variegated dark yellowish brown (10*YR* 4/2), yellowish orange (10*YR* 6/7), orange (5*YR* 6/8), and light gray (*N* 7)	0–9
Sand, fine to very coarse; sparse pebbles (4 cm); abundant silt and clay; poorly sorted, very stiff, variegated moderate red (5*R* 4/6) and light gray (*N* 7)	9–13
Chowan River Formation	
Sand, fine to very coarse; minor silt and clay; coarsens downward, poorly sorted, firm, dark yellowish orange (10*YR* 6/6)	13–19
Yorktown Formation (zone 2)	
Silt and clay and abundant fine sand; sparse granules; abundant mica near top; firm, dark yellowish orange (10*YR* 6/6)	19–24
Silt and clay and fine sand; sparse granules; firm, brown (5*YR* 4/6)	24–25
Silt and clay and abundant medium sand; sparse granules; pebbles (2 cm) toward bottom; shell fragments; firm, bluish gray (5*B* 5/1)	25–26
Bedrock	
Unknown bedrock; refusal	at 26

Base of lower Bacons Castle Formation:	**+147 feet above sea level**
Base of Chowan River Formation:	**+141 feet above sea level**
Base of Yorktown Formation (zone 2):	**+134 feet above sea level**

Bottomed on unknown bedrock

SK–94–13: On northern side of Va. State Road 632, 0.7 mile east of western quadrangle border, in west-central 1/9th of map area (latitude 36.5687° N., longitude 77.6111° W.). Surface elevation about 152 feet.

LITHOLOGY DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, fine, moderately sorted; sparse clay laminae; mica; heavy minerals; very stiff, variegated light brown (5*YR* 6/4) and moderate red (5*R* 4/6)..... 0–9

Sand, medium to very coarse; abundant pebbles up to 2 cm in diameter; minor clay laminae near top; stiff, dark yellowish orange (10*YR* 6/6) grading down to dusky red (5*R* 3/4) 9–17

Sand, medium to very coarse; abundant pebbles up to 3 cm in diameter; minor clay laminae; small shell fragments; stiff, dark yellowish orange (10*YR* 6/6) 17–27

Yorktown Formation (zone 2)

Silt and clay, sandy (very fine), micaceous, firm, light gray (*N* 7) 27–39

Granite

Saprolite from granite, angular quartz, relict feldspar, mica, very stiff, pale blue (5*B* 6/2) 39–41

Base of lower Bacons Castle Formation: +125 feet above sea level
Base of Yorktown Formation (zone 2): +113 feet above sea level

Bottomed in saprolite from granite

SK–94–14: Along northeastern side of Va. State Road 631, 0.3 mile northwest of where Va. State Road 631 starts at N.C./Va. boundary, in central 1/9th of map area (latitude 36.5490° N., longitude 77.5710° W.). Surface elevation about 140 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, medium, granular; sparse mica; stiff, orange (5*YR* 5/8) and reddish orange (10*R* 5/7)	0–6
Sand, fine to medium; sparse mica; stiff, dark yellowish orange (10*YR* 6/6)	6–9
Sand, medium to very coarse, granular; mixed rounded to angular pebbles (2 cm; some concretions); sparse mica; stiff, reddish orange (10*R* 5/7)	9–11
Chowan River Formation	
Sand, medium, granular; sparse clay laminae; clay clasts (1 cm), pebbles (1 cm) and sparse heavy minerals; stiff, yellowish orange (10*YR* 6/6) and moderate pink (5*R* 7/4)	11–29
Sand, medium, granular; spherical to discoidal pebbles up to 1.5 cm in diameter increasingly abundant downward; sparse heavy minerals; stiff, grading down to loose; yellowish orange (10*YR* 6/6)	29–34
Yorktown Formation (zone 2)	
Silt and clay, sandy (very fine); sparse pebbles up to 1 cm in diameter, grading down to pebbles up to 3 cm in diameter near base; contains abundant shell fragments of *Mulinia*, *Turritella*, and *Chesapecten*; grayish yellow (5*Y* 8/4) grading down to bluish gray (5*B* 5/1)	34–64
Carolina slate belt rocks	
Saprolite of phyllite, very stiff, greenish gray (5*GY* 5/1)	64–66

Base of lower Bacons Castle Formation: **+129 feet above sea level**
Base of Chowan River Formation: **+106 feet above sea level**
Base of Yorktown Formation (zone 2): **+76 feet above sea level**

Bottomed in saprolite from Carolina slate belt rocks

SK–94–15: On northwestern side of unnumbered road, 0.03 mile south of N.C./Va. boundary and 0.68 mile west of eastern quadrangle border, on bluff above Fontaine Creek, in east-central 1/9th of map area (latitude 36.5448° N., longitude 77.5120° W.). Surface elevation about 120 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine to coarse, sorted, stiff, variegated moderate red (5*R* 4/6), orange (5*YR* 5/8), and light gray (*N* 7)	0–6
Sand, very fine; silt and clay; stiff, variegated moderate red (5*R* 4/6) and orange (5*YR* 5/8)	6–13
Clay and silt, firm, light gray (*N* 7)	13–14
Clay, silt, and sand, very fine, loose, dark yellowish orange (10*YR* 6/6) grading down to grayish orange (10*YR* 6/4)	14–30
Sand, very fine to medium, sorted, with clay silt; clay clasts (1 cm) and minor laminae; loose, orange gray (10*YR* 9/1)	30–39
Yorktown Formation (zone 2)	
Clay, silt, and sand (very fine to medium); mica; loose, bluish gray (5*B* 5/1)	39–41

Base of upper Bacons Castle Formation: **+81 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

SK–94–16: On northwestern side of N.C. State Road 1300, 0.33 mile west of eastern quadrangle border, north of Corwells Millpond, in southeastern 1/9th of map area (latitude 36.5134° N., longitude 77.5060° W.). Surface elevation 91 feet.

LITHOLOGY	DEPTH IN FEET
Artificial fill, pebbly sand	0–4
Alluvium	
Sand, fine to medium, angular, silty, loose; soft drilling; abundant rounded quartz pebbles up to 3 cm in diameter in basal foot; yellowish brown (10*YR* 5/2) grading down to olive gray (5*Y* 4/1)	4–11
Chowan River Formation	
Silt, sandy (very fine), grading down to silty, very fine sand; finely micaceous, dark greenish gray (5*G* 4/1); rounded quartz pebbles up to 2 cm in diameter at base	11–22
Yorktown Formation (zone 2)	
Sand, fine to medium, poorly sorted, firm, dark greenish gray (5*G* 4/1)	22–26
Sand, fine to medium, shelly, greenish gray (5*G* 5/1)	26–36
Eastover Formation	
Sand, fine to medium, sparsely shelly; sparse pebbles up to 0.5 cm in diameter at top but pebbles more abundant downward; dark greenish gray (5*GY* 4/1)	36–48
Patuxent Formation	
Sand, medium to coarse, coarsely micaceous, garnetiferous; contains quartz pebbles 0.5 cm in diameter; greenish gray (5*G* 5/1) grading down to light gray *(N* 7)	48–51

Base of alluvium:	**+80 feet above sea level**
Base of Chowan River Formation:	**+69 feet above sea level**
Base of Yorktown Formation (zone 2):	**+55 feet above sea level**
Base of Eastover Formation:	**+43 feet above sea level**

Bottomed in Patuxent Formation

SK–94–17: At entrance to dirt road on southern side of N.C. State Road 1203, 1.05 miles (slightly north of) west from 103-foot spot elevation at intersection of N.C. State Road 1203 and U.S. Highway 301, in south-central 1/9th of map area (latitude 36.5166° N., longitude 77.5594° W.). Surface elevation 130 feet.

LITHOLOGY — DEPTH IN FEET

Upper Bacons Castle Formation (Bahramsville Member)

Sand, medium, grading down to medium to coarse; angular, orange (5*YR* 6/7) 0–5

Silt, clayey, sandy (very fine), finely micaceous, moderate red (5*R* 4/6) with very light gray (*N* 8) and dark yellowish orange (10*YR* 6/6) mottles, grading down to all moderate red (5*R* 4/6) 5–14

Sand, medium to coarse; abundant rounded quartz pebbles up to 2 cm in diameter; orangish pink (10*YR* 8/4) 14–16

Sand, medium to very coarse, angular; contains abundant quartz pebbles up to 5 cm in diameter; clay ball at 25 feet; orangish pink (10*YR* 8/4) grading down to dark yellowish orange (10*YR* 6/6) 16–27

Chowan River Formation

Silt, clayey, very light gray (*N* 8) grading down through light gray (*N* 7) to medium bluish gray (5*B* 5/1); lower contact somewhat gradational 27–32

Sand, fine to medium, clayey, silty, grading down to angular, coarse to very coarse sand; contains quartz pebbles up to 4 cm in diameter; light gray (*N* 7) grading down to dark yellowish orange (10*YR* 6/6) 32–39

Yorktown Formation (zone 2)

Silt, sandy (very fine), slightly clayey, finely micaceous; contains sporadic lenses of very fine or fine clean sand; shelly below 50 feet (including *Chesapecten*, *Mulinia*, and *Turritella*); medium bluish gray (5*B* 5/1); lower contact gradational 39–66

Sand, fine, grading down to fine to medium; shelly; pebbly in basal 4 feet; medium bluish gray (5*B* 5/1) 66–74

Eastover Formation

Sand, fine, well-sorted; phosphate granules along basal contact; dark greenish gray (5*GY* 4/1) 74–84

Granite(?)

Total refusal, no recovery, probably granite ..... at 84

Base of upper Bacons Castle Formation: **+103 feet above sea level**
Base of Chowan River Formation: **+91 feet above sea level**
Base of Yorktown Formation (zone 2): **+56 feet above sea level**
Base of Eastover Formation: **+46 feet above sea level**

Bottomed on granite(?)

SK–94–18: On western side of power line, 0.85 mile east of western quadrangle border and 0.46 mile north of southern quadrangle border, in southwestern 1/9th of map area (latitude 36.5067° N., longitude 77.6093° W.). Surface elevation 170 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine to medium, subangular, grayish orange (10*YR* 7/4) grading rapidly down to orange (5*YR* 6/8)	0–6
Sand, fine to medium, silty, clayey, orange (5*YR* 6/8) with very light gray (*N* 8) and moderate red (5*R* 4/6) mottles; lower contact gradational	6–11
Sand, very fine to fine, clayey, silty, micaceous, stiff, orange (5*YR* 6/8) with very light gray (*N* 8) and moderate red (5*R* 4/6) mottles	11–16
Sand, medium to very coarse, angular, silty, yellowish orange (10*YR* 7/7); lower contact gradational	16–19
Sand, coarse to very coarse, angular, granular; contains one rounded, elongate quartz pebble 0.75 x 3.0 cm; pale yellowish orange (10*YR* 8/6)	19–24
Chowan River Formation	
Silt, clayey, sandy (very fine to angular coarse), grading down to very fine to fine sand with minor medium to coarse fraction, silty, clayey, finely micaceous, grayish orange (10*YR* 7/4) grading rapidly down to light gray (*N* 7) with brown (5*YR* 5/6) blotches; lower contact gradational	24–30
Sand, fine to medium; very fine to fine dark heavy mineral grains abundant; clayey matrix; pinkish gray (5*YR* 8/1)	30–32
Sand, dominantly fine to medium but with minor coarse and very coarse fraction, granular, silty; clayey matrix; basal foot contains abundant rounded quartz pebbles 1–2 cm in diameter; pinkish gray (5*YR* 8/1)	32–34
Yorktown Formation (zone 3)	
Sand, fine to medium, subrounded to rounded, well-sorted; contains 1–2 percent very fine to fine dark heavy mineral grains; very pale orange (10*YR* 8/2); lower contact gradational	34–38

Sand, dominantly medium; contains scattered subrounded to rounded quartz granules; well sorted; contains 1 to 2 percent very fine to fine dark heavy mineral grains; very pale orange (10*YR* 8/2) 38–46

Sand, medium to coarse; contains abundant rounded to discoidal quartz pebbles up to 4 cm in diameter; very pale orange (10*YR* 8/2) 46–49

Yorktown Formation (zone 2)

Silt, clayey, sandy (very fine), finely micaceous, brown (5*YR* 4/1) grading down within 3 feet to medium bluish gray (5*B* 5/1) 49–62

Sand, fine; contains abundant rotten shells (*Chesapecten*, *Mulinia*, oyster, and other shells), medium bluish gray (5*B* 5/1) 62–70

Coquina; shell hash in granular fine to medium sand matrix 70–71

Granite

Saprolite from granite, clay with moderately abundant angular quartz sand grains, moderate greenish gray (5G 7/1) 71–76

Base of lower Bacons Castle Formation: +146 feet above sea level
Base of Chowan River Formation: +136 feet above sea level
Base of Yorktown Formation (zone 3): +121 feet above sea level
Base of Yorktown Formation (zone 2): +99 feet above sea level

Bottomed in saprolite from granite

Stony Creek Quadrangle

SC–93–1: On southern side of Va. State Road 643, 0.1 mile west of Hunting Quarter Branch, 0.54 mile west of eastern quadrangle border and 0.19 mile north of southern quadrangle border, in southeastern 1/9th of map area (latitude 36.8781° N., longitude 77.3843° W.). Surface elevation 135 feet.

LITHOLOGY — DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, dominantly fine grained but with a medium to coarse fraction, subangular, light olive brown (2.5*Y* 5/6) grading down to yellowish brown (10*YR* 5/6) with reddish yellow (5*YR* 6/8) and light gray (10*YR* 7/1) mottles 0–6

Sand, fine-grained, finely micaceous, yellowish brown (10*YR* 5/6) with reddish yellow (5*YR* 6/8) and light gray (10*YR* 7/1) mottles 6–11

Sand, dominantly very coarse grained, muddy; contains subrounded to subangular quartz pebbles up to 1.5 cm in diameter; brownish yellow (10*YR* 6/8) to yellowish brown (10*YR* 6/4) with streaks of strong brown (7.5*YR* 5/8) 11–15

Chowan River Formation

Clay, dense, silty, slightly micaceous, grading down to clayey, micaceous silt; contains burrows (up to 0.5 cm in diameter) filled with very fine sand; light gray (2.5*Y* 7/2) with streaks and mottles of strong brown (7.5*YR* 5/8) 15–23

Silt, clayey, micaceous, grading down from pale olive (5*Y* 6/3) to olive (5*Y* 5/4) 23–24

Silt, clayey, micaceous; subrounded to subangular quartz pebbles up to 4 cm long in fine sandy matrix on basal contact; olive gray (5*Y* 5/1) grading down to dark gray (*N* 3) at base 24–27

Sand, fine to medium, muddy, greenish gray (5*GY* 5/1) 27–31

Sand, medium to coarse, grading down to coarse to very coarse sand; angular to subangular; contains subrounded to subangular pebbles up to 2.5 cm in diameter; greenish gray (5*GY* 5/1) 31–39

Yorktown Formation (zone 3)

Sand, fine to medium, silty, carbonaceous (buried soil?), olive gray (5*Y* 4/1)..... 39–40

Sand, fine to medium, clean; pebble bed at base with pebbles up to 2 cm in diameter; white (10*YR* 8/2) with streaks of strong brown (7.5*YR* 5/8)..... 40–43

Yorktown Formation (zone 2)

Silt, clayey, massive, greasy; contains finely disseminated pyrite; shelly below 56 feet (from 56 to 78 feet, mostly *Mulinia* with sparse *Turritella*, mostly *Turritella* with sparse *Mulinia* from 78 to 82 feet); top 4 inches weathered to reddish yellow (7.5*YR* 6/8 to 7.5*YR* 5/8), below that greenish gray (5*GY* 5/1) and olive gray (5*Y* 4/1)..... 43–82

Sand, very fine, silty, shelly with a diverse fauna including *Mulinia*, *Turritella*, pectenids, and oysters; rounded to subangular quartz pebbles up to 5 cm in diameter present near base; greenish gray (5*GY* 5/1) to olive gray (5*Y* 4/1) 82–86

Impenetrable hard bed, probably dense pebble and boulder bed at base of Yorktown Formation ..... at 86

Base of lower Bacons Castle Formation: +120 feet above sea level
Base of Chowan River Formation: +96 feet above sea level
Base of Yorktown Formation (zone 3): +92 feet above sea level
Base of Yorktown Formation (zone 2): < +49 feet above sea level

Bottomed on impenetrable hard bed near base of Yorktown Formation

SC–93–2: On western side of U.S. Route 301, 0.2 mile north of High Hill Branch, 1.57 miles west of eastern quadrangle border and 0.72 mile north of southern quadrangle border, in southeastern 1/9th of map area (latitude 36.8854° N., longitude 77.4031° W.). Surface elevation about 92 feet.

LITHOLOGY	DEPTH IN FEET
Yorktown Formation (zone 2)	
Silt, clayey, dense, massive, light grayish brown (2.5*Y* 6/2) and brownish yellow (10*YR* 6/8) to yellow (10*YR* 7/8)	0–16
Silt, clayey, dense, massive, shelly, greenish gray (5*G* 5/1) to dark greenish gray (5*GY* 4/1)	16–24
Gravel containing rounded to subrounded vein quartz clasts up to 4.5 cm in diameter, in matrix of very fine silty sand, shelly; tough drilling; greenish gray (5*G* 5/1) to dark gray (*N* 3 to *N* 4)	24–28
Patuxent Formation	
Sand, coarse to very coarse, poorly sorted; contains rounded to subrounded pebbles up to 1 cm in diameter; sparse garnets, light greenish gray (5*G* 7/1)	28–31
Used gravel bit to spin down through sands and gravelly sands	31–135
Petersburg Granite(?)	
Refusal, presumed top of granite	at 135

Base of Yorktown Formation (zone 2): **+64 feet above sea level**
Base of Patuxent Formation: **-43 feet below sea level**

Bottomed on Petersburg Granite(?)

SC–93–3: On southeastern side of intersection of Va. State Route 630 and Va. State Route 648, near 160 foot spot elevation, 6.57 miles west of eastern quadrangle border and 1.90 miles north of southern quadrangle border, in southwestern 1/9th of map area (latitude 36.9028° N., longitude 77.4935° W.). Surface elevation 159 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, dominantly very fine to fine but with a small medium to very coarse fraction, silty, dense, brownish yellow (10*YR* 6/8), yellow (10*YR* 7/8), light red (2.5*YR* 6/8), and pale brown (10*YR* 7/3); lower contact somewhat gradational	0–12
Sand, medium to coarse, poorly sorted, with subangular quartz pebbles up to 0.5 cm in diameter; light reddish brown (5*YR* 6/3); grading down to garnetiferous, coarse to very coarse, poorly sorted sand, with subrounded to subangular quartz pebbles up to 2 cm in diameter; pale brown (10*YR* 8/4 to 10*YR* 7/3)	12–23
Sand, medium to coarse, much better sorted than overlying sand units, with polished rounded to subrounded quartz pebbles up to 5 cm in diameter at base, yellow (10*YR* 8/8)	23–24
Yorktown Formation (zone 2)	
Silt, sandy (very fine to fine), sparsely micaceous, light gray (5*Y* 7/2)	24–30
Gravel containing polished quartz discoids up to 2.5 cm in diameter, in matrix of silt to coarse sand; silvery mica abundant; garnet and zircon present; light brownish gray (2.5*Y* 6/2)	30–32
Petersburg Granite(?)	
Refusal; tried rock-bit but stems snapped so no recovery; presumed top of granite	at 32

Base of lower Bacons Castle Formation: **+135 feet above sea level**
Base of Yorktown Formation (zone 2): **+127 feet above sea level**

Bottomed on Petersburg Granite(?)

SC–93–4: On eastern side of dirt road leading north to farm house, 0.05 mile north of Va. State Road 648 and 0.97 mile east-southeast of intersection of Va. State Road 630 and Va. State Road 648, 5.63 miles west of eastern quadrangle border and 1.64 miles north of southern quadrangle border, in southwestern 1/9th of map area (latitude 36.8988° N., longitude 77.4766° W.). Surface elevation 145 feet.

LITHOLOGY DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, medium to very coarse; contains quartz pebbles up to 0.5 cm in diameter; pale brown (10*YR* 7/3) (possibly artificial fill) 0–3

Sand, fine to medium, poorly sorted, clayey, stiff, red (2.5*YR* 4/8), light gray (2.5*Y* 7/2), and brownish yellow (10*YR* 6/8) 3–9

Sand, coarse to very coarse, red (2.5*YR* 4/8); lower contact abrupt 9–10

Silt, clayey, greasy, reddish yellow (7.5*YR* 6/8) and light gray (2.5*Y* 7/2) to yellow (10*YR* 7/8); lower contact gradational 10–13

Sand, fine, grading down to medium; reddish yellow (7.5*YR* 6/6) to pale yellow (5*Y* 8/4); lower contact gradational 13–15

Sand, coarse to very coarse, with quartz granules and pebbles up to 0.5 cm in diameter, very pale brown (10*YR* 7/3); light gray (2.5*Y* 7/2) clay lens at base 15–17

Sand, dominantly fine to medium but with minor coarse fraction; contains scattered quartz pebbles up to 2.5 cm in diameter; very pale brown (2.5*Y* 6/2) to light gray (2.5*Y* 7/2); light gray (2.5*Y* 7/2) clay lens at base 17–21

Sand, coarse to very coarse; contains polished quartz pebbles up to 1.5 cm in diameter; brownish yellow (10*YR* 6/8); heavy mineral fraction includes garnet, epidote, rutile, and ilmenite 21–25

Sand, medium to coarse, yellow (2.5*Y* 8/6) to pale yellow (2.5*Y* 8/4) 25–26

Gravel containing clasts of rounded to subrounded quartz up to 2.5 cm in diameter; dark yellowish brown (10*YR* 4/6) 26–28

Yorktown Formation (zone 2)

Silt, greasy; oxidized in upper foot to strong brown (7.5*YR* 5/8);
below that, greenish gray (5*GY* 5/1) to bluish gray (5*B* 5/1) 28–38

Sand, very fine but with medium to coarse fraction; contains
quartz pebbles up to 4 cm in diameter and some smaller
granite pebbles; greenish gray (5*GY* 5/1) to bluish gray (5*B* 5/1) 38–39

Petersburg Granite

Saprolite from granite, clay, silty, silvery mica present; contains
coarse to very coarse grains of quartz; bluish gray (5*B* 5/1)..... 39–41

Base of lower Bacons Castle Formation: **+117 feet above sea level**
Base of Yorktown Formation (zone 2): **+106 feet above sea level**

Bottomed in saprolite from Petersburg Granite

SC–93–5: On northern side of Va. State Route 648, 0.95 mile west-southwest of Va. State Route 649, 4.45 miles west of eastern quadrangle border and 1.31 miles north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.8941° N., longitude 77.4555° W.). Surface elevation 111 feet.

LITHOLOGY

DEPTH IN FEET

Windsor Formation

Sand, very fine to fine, silty, micaceous, strong brown (7.5*YR* 5/8) to light gray (5*Y* 7/1); lower contact somewhat gradational..... 0–5

Clay, dense, micaceous; contains very fine sand stringers; light gray (5*Y* 7/1) with blobs and streaks of strong brown (7.5*YR* 5/8)..... 5–14

Sand, very fine grading downward through medium to coarse, light gray (5*Y* 7/1) with mottles of strong brown (7.5*YR* 5/8)…….. 14–20

Sand, coarse to very coarse, with quartz granules and pebbles to 0.5 cm, moderately well-sorted, pale yellow (2.5*Y* 7/4) to light gray (2.5*Y* 7/2) or white (2.5*Y* 8/2) grading down to dominantly white (2.5*Y* 8/2), feldspathic..... 20–25

Gravel containing quartz pebbles up to 3.5 cm in diameter; yellowish brown (10*YR* 5/8)..... 25–26

Yorktown Formation (zone 2)

Silt, clayey, greasy, finely micaceous; rotten shells present in basal foot; greenish gray (5*GY* 5/1)..... 26–32

Gravel containing polished rounded to subrounded quartz pebbles up to 4.5 cm in diameter in shell, sand, and clay matrix; greenish gray (5*GY* 5/1)..... 32–33

Petersburg Granite

Saprolite from granite, biotitic, bluish gray (5*B* 5/1)..... at 33

Base of Windsor Formation: **+85 feet above sea level**
Base of Yorktown Formation (zone 2): **+78 feet above sea level**

Bottomed on Petersburg Granite

SC–93–6: On northeastern side of intersection of Va. State Route 648 and Va. State Route 649 near 88-foot spot elevation, 3.54 miles west of eastern quadrangle border and 1.12 miles north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.8912° N., longitude 77.4391° W.). Surface elevation 86 feet.

LITHOLOGY DEPTH IN FEET

Alluvium

Sand, dominantly fine to medium but with a minor coarse fraction, brown (10*YR* 6/8) 0–0.5

Sand, fine to coarse, very clayey, brownish yellow (10*YR* 6/8) 0.5–1

Sand, medium to very coarse, modal size varies down section; finer fractions contain very fine dark heavy minerals; pale yellow (2.5*Y* 7/4) to light gray (5*Y* 7/1) and white (5*Y* 8/2); lower contact gradational 1–5

Sand, fine to very coarse; contains sparse quartz pebbles up to 2 cm in diameter; muscovite and very fine dark heavy minerals abundant; very little clay; light olive gray (5*Y* 5/1) to greenish gray (5*GY* 5/1)..... 5–10

Sand, fine to very coarse, gravelly with vein quartz and quartzite cobbles up to 4.5 cm in diameter; light olive gray (5*Y* 6/1) 10–16

Sand, fine to very coarse, gravelly with vein quartz and quartzite cobbles up to 8 cm in diameter, brownish gray (5*YR* 4/1) to dark gray (*N* 3); globs of greasy, dark gray (*N* 3) clay with carbonized wood chips near base (paleosol?) 16–29

Petersburg Granite

Saprolite from granite, sand, fine to very coarse, scattered angular grains up to 0.5 cm in diameter; clayey; very dense; hard drilling; very light gray (*N* 8) to light gray (*N* 7) grading down to speckled light gray (*N* 7) and medium light gray (*N* 6) 29–38

Impenetrable bed, presumed top of granite bedrock..... at 38

Base of alluvium: **+57 feet above sea level**

Bottomed in saprolite from Petersburg Granite

SC–93–7: On southern side of dirt road, 0.25 mile east of Seaboard Railroad and 0.2 mile north of Nottoway River, 2.49 miles west of eastern quadrangle border and 0.73 miles north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.8858° N., longitude 77.4197° W.). Surface elevation 84 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, medium to very coarse, poorly sorted, strong brown (7.5*YR* 5/6)	0–1
Sand, very fine to fine, silty, clayey and very micaceous, well-sorted, olive yellow (2.5*Y* 6/6) to brownish yellow (10*YR* 6/8); lower contact abrupt	1–10
Gravel containing mostly clasts of rounded to subrounded vein quartz up to 3.5 cm in diameter; dark yellowish brown (10*YR* 4/6) grading down to light gray (2.5*Y* 7/2); large epidote crystal and some granite clasts present; sand matrix mostly coarse to very coarse sand	10–16
Gravel containing clasts of rounded to subrounded vein quartz, quartzite, and granite up to 4.5 cm in diameter; light gray (*N* 7) to medium light gray (*N* 6); large cobbles at base up to 8 cm in diameter; smears of dark gray clay near base (paleosol?)	16–21
Patuxent Formation	
Sand, coarse to very coarse; contains scattered quartz pebbles up to 3 cm in diameter; light gray (5*Y* 7/1 to *N* 7), very dense	21–33
Gravel containing quartz pebbles up to 3 cm in diameter; light gray (5*Y* 7/1 to *N* 7), very dense	33–34
Sand, fine to coarse with abundant quartz granules, very dense, light gray (5*Y* 7/1 to *N* 7)	34–41
Used gravel bit to spin down through sand, gravel, and clay	41–95
Petersburg Granite	
Saprolite from granite, angular quartz in clay matrix	95 –96.5
Refusal	at 96.5

Base of alluvium: **+63 feet above sea level**
Base of Patuxent Formation: **-11 feet below sea level**

Bottomed on Petersburg Granite

SC–93–8: On western side of U.S. Route 301, 0.5 mile south of High Hill Branch, 1.87 miles west of eastern quadrangle border and 0.09 mile north of southern quadrangle border, in southeastern 1/9th of map area (latitude 36.8763° N., longitude 77.4084° W.). Surface elevation 101 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, dominantly fine but very fine to very coarse; stiff and clayey from 3 to 5 feet; yellow (10*YR* 7/8) to brownish yellow (10*YR* 6/8)	0–5
Sand, fine, interbedded at cm scale with sandy (fine) clay; yellow (10*YR* 7/8) to brownish yellow (10*YR* 6/8)	5–7
Clay, sandy to silty; quartz granules and pebbles up to 1 cm in diameter in basal foot; stiff, dense, pinkish gray (7.5*YR* 6/2) and brown (7.5*YR* 7/2) grading down to light gray (5*Y* 7/2) and pale olive (5*Y* 6/3)	7–16
Clay containing small quartz pebbles, 0.5 cm in diameter; light gray (5*Y* 7/2) and pale olive (5*Y* 6/3) grading down to pale olive (5*Y* 6/4)	16–21
Sand, fine to very coarse, poorly sorted, clayey, dense; contains abundant subangular to subrounded quartz pebbles up to 2 cm in diameter; greenish gray (5*GY* 6/1) to light gray (*N* 7); lower contact abrupt	21–27
Yorktown Formation (zone 2)	
Silt, clayey, greasy, greenish gray (5*GY* 5/1)	27–31

Base of Windsor Formation: **+74 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

SC–93–9: At entrance to dirt road east of Va. State Route 640, 0.95 mile north of intersection of Va. State Route 640 and Va. State Route 662, 0.27 mile west of eastern quadrangle border and 2.67 miles north of southern quadrangle border, in southeastern 1/9th of map area (latitude 36.9142° N., longitude 77.3795° W.). Surface elevation 77 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, very fine to fine, silty; scattered rare very coarse grains; light gray (2.5*Y* 7/2) to pale yellow (5*Y* 7/4) with brownish yellow (10*YR* 6/8) mottles; lower contact gradational	0–5
Sand, fine to medium; contains scattered quartz pebbles up to 1 cm in diameter; light gray (2.5*Y* 7/2) to pale yellow (5*Y* 7/4) with brownish yellow (10*YR* 6/8) mottles; lower contact gradational	5–8
Sand, medium to coarse; contains scattered subangular to subrounded quartz pebbles and rare granite pebbles up to 2.5 cm in diameter; light gray (2.5*Y* 7/2) to pale yellow (5*Y* 7/4) with brownish yellow (10*YR* 6/8) mottles; lower contact gradational	8–11
Sand, coarse to very coarse; contains abundant mostly subrounded pebbles up to 5 cm in diameter; yellow (10*YR* 7/8) to brownish yellow (10*YR* 6/8)	11–14
Sand, very fine to fine, silty, soft, micaceous; very fine dark heavy minerals abundant; greenish gray (5*G* 5/1 to 5*G* 6/1); lower contact somewhat gradational	14–16
Sand, coarse to very coarse; very pebbly with rounded to subangular clasts of quartz and slate belt rocks up to 3.5 cm in diameter; darkens downward to dark greenish gray (5*GY* 4/1); cobbles up to 5 cm in diameter at base	16–28
Patuxent Formation	
Sand, coarse to very coarse; contains quartz pebbles up to 2 cm in diameter; light gray (*N* 7) to very light gray (*N* 8); sharp color contrast with overlying unit	28–41
Sand, coarse to very coarse; quartz pebbles up to 5 cm in diameter abundant at base; medium light gray (*N* 6)	41–56

Clay, dense, greasy, micaceous, brownish black (5*YR* 2/1)	56–57
Sand, fine to medium, well-sorted, light gray (*N* 7)	57–61

Base of alluvium: **+49 feet above sea level**

Bottomed in Patuxent Formation

SC–93–10: On northern side of Va. State Route 670, 0.85 mile east-northeast of Interstate 95, 0.21 mile west of eastern quadrangle border and 5.63 miles north of southern quadrangle border, in east-central 1/9th of map area (latitude 36.9573° N., longitude 77.3787° W.). Surface elevation 79 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Silt, very clayey, dense, sandy, with sparse quartz granules and pebbles up to 0.5 cm in diameter, light gray (5*Y* 7/2) to pale yellow (5*Y* 7/3); lower contact abrupt	0–3
Sand, medium, poorly sorted, grading down to very coarse and pebbly with quartz clasts up to 1.5 cm in diameter; yellow (2.5*Y* 7/5) to pale yellow (2.5*Y* 7/4) with streaks of brownish yellow (10*YR* 6/8); carbonaceous streaks of yellowish brown (10*YR* 5/8), black (*N* 1), and light grayish brown (2.5*Y* 6/2) in basal foot	3–7
Gravel containing subrounded to rounded quartz pebbles and clay balls from underlying silt; contains quartz clasts up to 5 cm in diameter; yellowish brown (10*YR* 5/8) to light grayish brown (2.5*Y* 6/2)	7–9
St. Marys Formation	
Silt, very clayey, micaceous, greasy, dark yellowish brown (10*YR* 4/4) rapidly grading down to grayish black (*N* 2.5) and brownish gray (5*YR* 4/1)	9–11
Gravel containing quartz clasts up to 3.5 cm in diameter, in clayey silt matrix, micaceous, greasy, grayish black (*N* 2.5) and brownish gray (5*YR* 4/1)	11–12
Aquia Formation	
Sand, very fine, silty, very micaceous; quartz pebbles up to 3.5 cm in diameter scattered along basal contact; yellow (2.5*Y* 7/6)	12–13

Patuxent Formation

Sand, coarse to very coarse; contains scattered pebbles of quartz up to 2 cm in diameter; white (10*YR* 8/1), reddish yellow (7.5*YR* 6/8), and yellow (10*YR* 7/6) 13–16

Base of Windsor Formation: **+70 feet above sea level**
Base of St. Marys Formation: **+67 feet above sea level**
Base of Aquia Formation: **+66 feet above sea level**

Bottomed in Patuxent Formation

SC–93–11: On eastern side of Va. State Route 657, 0.8 mile south of intersection with Va. State Route 602, 1.52 miles west of eastern quadrangle border and 6.00 miles north of southern quadrangle border, in northeastern 1/9th of map area (latitude 36.9631° N., longitude 77.4024° W.). Surface elevation 75 feet.

LITHOLOGY	DEPTH IN FEET
Charles City Formation	
Sand, mostly fine but up to very coarse, yellow (2.5*Y* 7/6)	0–3
Sand, dominantly fine, very clayey, stiff, white (5*Y* 8/1) to pinkish gray (5*YR* 8/1) with streaks of brownish yellow (10*YR* 6/8)	3–5
Clay, sandy, white (5*Y* 8/1) to pinkish gray (5*YR* 8/1) with streaks of brownish yellow (10*YR* 6/8)	5–6
Windsor Formation	
Sand, mostly coarse to very coarse, muddy, with quartz pebbles up to 1 cm in diameter; yellow (10*YR* 8/1) to reddish yellow (7.5*YR* 6/8)	6–14
Gravel containing quartz pebbles up to 4 cm in diameter, in matrix of coarse to very coarse muddy sand; yellow (10*YR* 8/1) to reddish yellow (7.5*YR* 6/8)	14–21
Gravel containing quartz pebbles up to 8 cm in diameter, in matrix of coarse to very coarse muddy sand; white (10*YR* 8/2)	21–32
Patuxent Formation	
Sand, medium to coarse; contains a few quartz pebbles up to 2 cm in diameter and white (*N* 9) clay balls up to 4 cm in diameter; white (10*YR* 8/2) and yellow (10*YR* 8/6) grading by 35 feet to light gray (*N* 7)	32–55
Sand, fine to medium, clayey, with small quartz pebbles up to 1 cm in diameter; brownish gray (5*Y* 4/1)	55–56

Base of Charles City Formation: **+69 feet above sea level**
Base of Windsor Formation: **+43 feet above sea level**

Bottomed in Patuxent Formation

SC–93–12: On eastern edge of field, 0.13 mile west of 121-foot spot elevation, 0.39 mile west of eastern quadrangle border and 8.12 miles north of southern quadrangle border, in northeastern 1/9th of map area (latitude 36.9938° N., longitude 77.3817° W.). Surface elevation 105 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, dominantly fine to medium, but ranges up to very coarse, loose, friable, moderate yellowish brown (10*YR* 5/4)	0–1
Sand, fine to medium, grading down to dominantly medium; contains rare rounded quartz pebbles up to 1.5 cm in diameter; clayey, slightly micaceous, light brown (2.5*YR* 5/8); clay lenses at 5 and 14 feet	1–14
Sand, medium, better sorted than sand in unit immediately above, sparsely micaceous, grading down to coarse in basal foot; plinthite lump on basal contact; yellowish orange (10*YR* 7/5)	14–22
Clay, greasy, dense, silty; some sandy stringers near base; dark yellowish orange (10*YR* 6/6) grading down to bluish greenish gray (5*BG* 6/1); lower contact abrupt	22–29
Sand, fine, silty, well-sorted, micaceous; pebble bed at base with rounded quartz clasts up to 6 cm in diameter; dusky yellow (5*Y* 7/4)	29–31
Upper Bacons Castle Formation (Bahramsville Member)	
Clay, silty, stiff, sandy; pebble bed at 32 feet with rounded quartz clasts up to 2 cm in diameter; micaceous, grayish orangish pink (5*YR* 7/2)	31–36
Sand, dominantly fine but with scattered grains up to very coarse; contains subrounded to rounded quartz pebbles up to 3 cm in diameter; dark yellowish orange (10*YR* 6/6)	36–38
Sand, coarse to very coarse; contains subrounded to rounded quartz pebbles up to 4 cm in diameter; pinkish gray (5*YR* 8/1)	38–58
Patuxent Formation	
Sand, coarse to very coarse, very dense, pale yellowish orange (10*YR* 8/6)	58–60

Base of Windsor Formation: **+74 feet above sea level**
Base of upper Bacons Castle Formation: **+47 feet above sea level**

Bottomed in Patuxent Formation

SC–93–13: At dirt road entrance near 86-foot bench mark on northern side of Va. State Route 40, 1.45 miles west of Interstate 95, 2.43 miles west of eastern quadrangle border and 4.84 miles north of southern quadrangle border, in central 1/9th of map area (latitude 36.9460° N., longitude 77.4187° W.). Surface elevation 90 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, fine to medium, loose, brownish gray (5*YR* 5/2)	0–1
Windsor Formation	
Sand, dominantly coarse, poorly sorted, muddy, dense, dusky yellow (5*Y* 6/4) grading down to yellowish gray (5*Y* 6/2)	1–5
Clay, yellowish gray (5*Y* 6/2); contains lenses of pebbles	5–8
Gravel containing clasts that include quartz pebbles and a fragment (8 cm in diameter) of a large quartzite cobble; stiff clay and sand matrix; light brown (5*YR* 6/4)	8–15

Base of alluvium: **+89 feet above sea level**

Bottomed in Windsor Formation

SC–93–14: On corner of abandoned dog leg of Va. State Route 680, 0.15 mile west of Va. State Route 618, 2.54 miles west of eastern quadrangle border and 7.58 miles north of southern quadrangle border, in north-central 1/9th of map area (latitude 36.9860° N., longitude 77.4206° W.). Surface elevation 142 feet.

LITHOLOGY DEPTH IN FEET

Upper Bacons Castle Formation (Bahramsville Member)

Sand, very fine to fine, silty and clayey, stiff, light brown (5*YR* 5/6) grading down through light brown (5*YR* 5/6) with moderate red (5*R* 5/7) mottles (4–5 feet) to variegated dusky red (5*R* 3/4), moderate red (5*R* 5/7), and yellowish gray (5*Y* 8/1) 0–7

Clay, sandy (fine) and silty, dense, sticky, yellowish gray with (5*Y* 8/1) dusky red (5*R* 3/4) and moderate red (5*R* 4/6) mottles 7–11

Sand, dominantly medium, but fine to coarse, silty, light brown (2.5*YR* 5/6) grading down to dark yellowish orange (10*YR* 6/6); lower contact gradational 11–16

Sand, coarse to very coarse, poorly sorted; subrounded quartz pebbles up to 3 cm in diameter present in basal 6 inches; pale reddish brown (10*R* 6/4) to dark yellowish orange (10*YR* 6/6) 16–22

Sand, medium to coarse, poorly sorted, clayey, grading down to very clayey, fine to medium sand; moderate red (5*R* 5/6) ..... 22 –27

Sand, coarse to very coarse, muddy; contains granules of quartz at some horizons; subrounded quartz pebbles up to 1 cm in diameter in basal foot; moderate reddish brown (10*R* 5/6) grading down to dark yellowish orange (10*YR* 6/6) near base 27–36

Sand, fine, silty; contains subangular to subrounded quartz pebbles up to 2 cm in diameter in basal 2 feet; dark yellowish orange (10*YR* 6/6) 36–41

Silt, very clayey, dark yellowish orange (10*YR* 6/8); 3-inch-thick layer ..... at 41

Sand, coarse, poorly sorted; contains abundant pebbles of subangular to subrounded quartz up to 2.5 cm in diameter; dark yellowish orange (10*YR* 6/8) 41–42

Yorktown Formation (zone 2)

Silt, clayey, greasy, yellowish gray (5*Y* 6/2); lower contact somewhat gradational 42–44

Silt, clayey, greasy, with scattered lenses of very fine to fine sand; medium dark gray (*N* 4) with a lens of yellowish gray (5*Y* 6/2) silt at 48–49 feet..... 44–51

Silt, clayey, greasy, yellowish orange (10*YR* 7/6), with a lens of moderate yellowish brown (10*YR* 5/4), very fine sand at 52 feet..... 51–65

Gravel containing silt and fine-grained sand matrix; subrounded to rounded quartz clasts up to 6 cm in diameter present; moderate yellowish brown (10*YR* 5/4) 65–70

Patuxent Formation

Sand, coarse, dense; contains subrounded quartz pebbles up to 2 cm in diameter; medium light gray (*N* 6), interbedded with some stiff, very light gray (*N* 8) clay layers..... 70–80

Base of upper Bacons Castle Formation: +100 feet above sea level
Base of Yorktown Formation (zone 2): +72 feet above sea level

Bottomed in Patuxent Formation

SC–93–15: On northern side of Va. State Route 40, 0.00 mile west of eastern quadrangle border and 4.33 miles north of southern quadrangle border, in east-central 1/9th of map area (latitude 36.9387° N., longitude 77.3748° W.). Surface elevation 66 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, medium to coarse; contains rare subrounded quartz pebbles up to 2 cm in diameter; loose; carbonaceous and light brown (5*YR* 5/6) in upper 2 feet; grayish orange (10*YR* 7/4) below that depth	0–5
Sand, coarse to very coarse; contains subrounded quartz pebbles up to 7 cm in diameter; grayish orange (10*YR* 5/6)	5–9.5
Sand, fine to medium, very clayey, micaceous, olive gray (5*Y* 5/1)	9.5–10
Patuxent Formation	
Sand, coarse to very coarse; contains scattered rounded to subrounded polished quartz pebbles up to 2.5 cm in diameter, more concentrated near base; very dense clayey matrix; grayish orange (10*YR* 7/4) down to 12 feet, then grades rapidly to bluish gray (5*B* 6/1)	10 –17
Silt, very clayey, micaceous, dark gray (*N* 3); 4-inch-thick layer	at 17
Sand, medium to coarse; contains rounded to subrounded polished quartz pebbles up to 1 cm in diameter; bluish gray (5*B* 6/1) with streaks of carbon near base	17–20

Base of alluvium: **+56 feet above sea level**

Bottomed in Patuxent Formation

SC–93–16: On northern side of Va. State Route 670, 0.18 mile west of eastern quadrangle border along road, 0.13 mile west of eastern quadrangle border, and 6.91 miles north of southern quadrangle border, in northeastern 1/9th of map area (latitude 36.9762° N., longitude 77.3773° W.). Surface elevation 69 feet.

LITHOLOGY DEPTH IN FEET

Alluvium

Sand, medium to coarse, very poorly sorted; contains granules and pebbles dominantly of rounded to subrounded quartz up to 2 cm in diameter, all in very dense clay-silt matrix; stiff drilling; dark yellowish orange (10*YR* 6/6) to yellowish gray (5*Y* 7/2)..... 0–5

Gravel containing clasts up to 9 cm in diameter, in matrix of medium to coarse sand and stiff clay; very rough drilling..... 5–11

Patuxent Formation

Sand, coarse to very coarse, light gray (*N* 7); contains rounded to subrounded, dark gray (*N* 3) quartz clasts up to 4 cm in diameter and brownish gray (5*YR* 4/1) mud ball clasts up to 3 cm in diameter; tough drilling..... 11–16

Base of alluvium: **+58 feet above sea level**

Bottomed in Patuxent Formation

SC–93–17: On eastern side of Va. State Route 648, 1.45 miles south of point where Va. State Route 40 crosses over Interstate 95, 1.13 miles west of eastern quadrangle border and 3.30 miles north of southern quadrangle border, in east-central 1/9th of map area (latitude 36.9229° N., longitude 77.3954° W.). Surface elevation 76 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, predominantly fine to medium, but ranges up to coarse, poorly sorted, clayey, silty, dark yellowish orange (10*YR* 6/6)	0–1
Sand, coarse to very coarse; rare pebbles up to 1 cm in diameter at top, becoming more abundant and larger (up to 6 cm) downward to base; grayish orange (10*YR* 7/4)	1–22
Sand, coarse, pinkish gray (5*YR* 8/1)	22–25
Sand, fine, silty, pinkish gray (5*YR* 8/1)	25–25.5
Sand, coarse to very coarse, pebbly, light brown (5*YR* 5/6)	25.5–26
St. Marys Formation	
Silt, very clayey, dense, pale yellowish brown (10YR 6/2) in upper 6 inches grading rapidly down to dark gray (*N* 3), brownish black (5*YR* 2/1), and brownish gray (5*YR* 4/1)	26–30
Gravel containing rounded to subrounded quartz pebbles up to 2.5 cm in diameter, in matrix of fine to very coarse sand; brownish gray (5*YR* 4/1)	30–31
Patuxent Formation	
Sand, coarse to very coarse; contains polished subrounded to rounded quartz pebbles up to 2 cm in diameter; light brownish gray (5*Y* 7/1)	31–37

Base of alluvium: **+50 feet above sea level**
Base of St. Marys Formation: **+45 feet above sea level**

Bottomed in Patuxent Formation

SC–93–18: On western side of new pond at end of Bollings Bridge Road, 0.7 mile south-southwest of crossing of Va. State Route 40 over Interstate 95, 0.69 mile west of eastern quadrangle border and 4.03 miles north of southern quadrangle border, in east-central 1/9th of map area (latitude 36.9341° N., longitude 77.3873° W.). Surface elevation 70 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, coarse to very coarse; contains quartz pebbles up to 2 cm in diameter; crunchy drilling suggests larger clasts present but not recovered; grayish orange (10*YR* 7/4) except for top foot, which is humic and darker; basal foot contains mud balls of greenish gray (10*GY* 5/1), very fine silty Yorktown Formation sand containing fragments of *Chesapecten* and barnacles	0–9
Patuxent Formation	
Sand, coarse to very coarse; contains polished rounded to subrounded quartz pebbles to 2 cm in diameter; light bluish gray (5*B* 5/1) to medium bluish gray (5*B* 7/1) with some carbonaceous black blobs; garnetiferous	9–11

Base of alluvium: **+61 feet above sea level**

Bottomed in Patuxent Formation

SC–93–19: At end of dirt road southeast of pond in field on northern edge of Galley Swamp, 0.7 mile southwest of intersection of Va. State Route 618 and Va. State Route 602, 2.67 miles west of eastern quadrangle border and 6.21 miles north of southern quadrangle border, in north-central 1/9th of map area (latitude 36.9662° N., longitude 77.4230° W.). Surface elevation 83 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, coarse to very coarse, silty, dark yellowish brown (10*YR* 4/2)	0–1
Sand, coarse to very coarse; contains abundant subrounded quartz pebbles up to 1 cm in diameter; light brown (5*YR* 5/6)	1–4
Sand, medium to coarse; much better sorted than above; dark yellowish orange (10*YR* 6/6)	4–5
Sand, coarse to very coarse; contains pebbles of subrounded quartz up to 1 cm in diameter; pale yellowish brown (10*YR* 6/3)	5–10
Sand, coarse to very coarse; contains abundant pebbles of subrounded quartz up to 3 cm in diameter and some rounded pebbles up to 5 cm in diameter at base; dark orange (2.5*YR* 5/8)	10–13
Yorktown Formation (zone 2)	
Sand, very fine to fine, silty, interlaminated with very clayey silt; dark bluish gray (5*B* 4/1)	13–17
Sand, fine to medium; contains abundant rounded to subrounded pebbles and discoids of quartz; dark bluish gray (5*B* 4/1)	17–20
Patuxent Formation	
Sand, coarse to very coarse; contains rounded to subrounded polished quartz pebbles up to 1.5 cm in diameter and one clay ball, 2 cm in diameter; light bluish gray (5*B* 8/1)	20–21

Base of alluvium: **+70 feet above sea level**
Base of Yorktown Formation (zone 2): **+63 feet above sea level**

Bottomed in Patuxent Formation

SC–93–20: On southeastern side of Va. State Route 680, 0.18 mile east-northeast of Stony Creek, 3.99 miles west of eastern quadrangle border and 6.58 miles north of southern quadrangle border, in north-central 1/9th of map area (latitude 36.9716° N., longitude 77.4467° W.). Surface elevation 80 feet.

LITHOLOGY DEPTH IN FEET

Alluvium

Sand, very fine to very coarse, silty; contains subrounded to rounded quartz pebbles up to 3 cm in diameter; dark yellowish orange (10*YR* 6/6)..... 0–3

Gravel containing subrounded to rounded quartz pebbles up to 8 cm in diameter, in coarse to very coarse sand matrix; pinkish gray (5*YR* 8/1) 3–11

Patuxent Formation

Sand, coarse to very coarse, pale orange (10*YR* 7/3); contains rounded to subrounded polished quartz pebbles mostly 2 to 3 cm in diameter (one discoid up to 5 cm in diameter) and very pale orange (10*YR* 8/2) clay balls up to 3 cm in diameter 11–22

Base of alluvium: **+69 feet above sea level**

Bottomed in Patuxent Formation

SC–93–21: On southern side of Va. State Route 666 in old driveway at 111-foot spot elevation, 0.09 mile west of power line, 4.34 miles west of eastern quadrangle border and 8.24 miles north of southern quadrangle border, in north-central 1/9th of map area (latitude 36.9956° N., longitude 77.4534° W.). Surface elevation 111 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, dominantly very fine to fine, but ranges up to very coarse; silty, clayey, dense, tough, yellowish brown (10*YR* 6/4)	0–2
Sand, coarse to very coarse, slightly clayey and silty, light brown (10*YR* 5/6)	2–6
Sand, dominantly very fine to fine, but ranges up to very coarse; silty, clayey, reddish orange (10*R* 6/6) to dark yellowish orange (10*YR* 6/6)	6–12
Sand, dominantly coarse to very coarse, but ranges down to fine; grayish orange pink (5*YR* 7/2) grading down to pinkish gray (5*YR* 8/1)	12–18
Sand, dominantly very fine to fine, but ranges up to medium; silty, clayey, yellowish gray (5*Y* 9/1 to 5*Y* 8/1)	18–20
Sand, coarse to very coarse; contains rounded to subrounded quartz pebbles up to 2 cm in diameter at base; yellowish gray (5*Y* 9/1 to 5*Y* 8/1)	20–23
Sand, very fine to fine, very silty, light brown (5*YR* 5/6); contains abundant rounded quartz pebbles up to 4 cm in diameter in basal 2 feet; lower contact gradational	23–32
Sand, medium to coarse; contains rounded quartz pebbles up to 4.5 cm in diameter; light brown (5*YR* 5/6)	32–37
Patuxent Formation	
Sand, fine to medium, white (*N* 9)	37–39
Clay, dark gray (*N* 3); 1-inch-thick layer	at 39
Sand, fine to medium; contains rounded to subrounded polished quartz pebbles up to 2 cm in diameter and carbon chunks (wood?) up to 1 cm in diameter	39–41

Base of Windsor Formation: **+74 feet above sea level**

Bottomed in Patuxent Formation

SC–93–22: On northeastern side of Va. State Route 666, 0.15 mile east of intersection of Va. State Route 666 and Va. State Route 626, 5.99 miles west of eastern quadrangle border and 8.16 miles north of southern quadrangle border, in northwestern 1/9th of map area (latitude 36.9944° N., longitude 77.4830° W.). Surface elevation 121 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, dominantly fine to medium, but ranges up to very coarse; contains small quartz pebbles up to 1 cm in diameter; dark yellowish orange (10*YR* 6/6) grading down to grayish orange (10*YR* 7/4); lower contact gradational	0–5
Sand, coarse to very coarse, grayish orange (10*YR* 7/4); contains quartz pebbles up to 2 cm in diameter; 6-inch-thick, light greenish gray (5*G*Y 8/1) clay layer at 7.5 feet	5–9
Yorktown Formation (zone 2)	
Silt, very clayey, sandy (very fine to fine), stiff, light greenish gray (5*GY* 8/1) grading down through light greenish gray with dark yellowish orange (10*YR* 6/6) mottles to dark yellowish orange and pale yellowish orange (10*YR* 8/2)	9–19
Gravel containing rounded to subrounded quartz pebbles up to 4.5 cm in diameter, in matrix of sandy clay; dark yellowish orange (10*Y*R 6/6) and pale yellowish orange (10*YR* 8/2)	19–23
Patuxent Formation	
Sand, coarse to very coarse, light bluish gray (5*B* 7/1); contains subrounded to rounded polished quartz pebbles up to 1 cm in diameter and a light gray (*N* 7) clay ball, 3 cm in diameter; tough drilling	23–26

Base of upper Bacons Castle Formation: **+112 feet above sea level**
Base of Yorktown Formation (zone 2): **+98 feet above sea level**

Bottomed in Patuxent Formation

SC–93–23: On western side of Va. State Route 626, 0.6 mile south of intersection of Va. State Route 626 and Va. State Route 665, 6.45 miles west of eastern quadrangle border and 6.81 miles north of southern quadrangle border, in northwestern 1/9th of map area (latitude 36.9747° N., longitude 77.4913° W.). Surface elevation 152 feet.

LITHOLOGY — DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, very fine to fine; contains scattered grains up to granule size; clayey, silty, reddish brown (10*R* 5/7); lower contact gradational 0–5

Sand, coarse to very coarse; contains quartz pebbles up to 2 cm in diameter at base; dark yellowish orange (10*YR* 6/6) and grayish orange pink (10*R* 8/2) 5–8

Silt, very clayey, sandy (very fine to fine), dark yellowish orange (10*YR* 6/6) grading down through light red (5*R* 6/6) with grayish pink (5*R* 8/2) mottles to moderate reddish brown (10*R* 6/6) 8–14

Sand, fine to medium, grading down to medium to coarse sand; well sorted, moderate red (5*R* 4/6) with layers of very light gray (*N* 8) grading to moderate reddish brown (10*R* 6/6) in basal foot 14–19

Silt, clayey, sandy (very fine to fine), dark yellowish orange (10*YR* 6/8); lower contact gradational 19–21

Sand, very fine to fine, grading down to fine to medium sand; silty, pale reddish purple (10*R*P 6/2) grading down through pale reddish brown (10*R* 5/4) to moderate reddish orange (10*R* 6/6) 21–37

Sand, medium to coarse; band of black heavy minerals and quartz pebbles 1–2 cm in diameter at base; dark yellowish orange (10*YR* 6/6) 37–38

Yorktown Formation (zone 2)

Sand, fine to medium, very clayey, grayish orange (10*YR* 7/4) with orange (5*YR* 5/8) mottles, grading down to light olive gray (5*Y* 6/1) 38–41

Silt, sandy (very fine to fine), interbedded with silty, very fine to fine sand; shelly (*Mulinia*, *Anadara transversa*, *Chesapecten*, and other mollusks); medium bluish gray (5*B* 5/1) 41–49

Sand, dominantly fine to medium, but ranges up to coarse; contains rounded to subrounded quartz pebbles and discoids up to 4 cm in diameter; medium bluish gray (5*B* 5/1) 49–52

Petersburg Granite

Saprolite from granite, very coarse angular quartz grains in clayey matrix, grayish bluish green (5*BG* 6/2); burrowed; burrows filled with immediately overlying sand lithology, shell fragments, and pebbles 52–56

Base of lower Bacons Castle Formation: **+114 feet above sea level**
Base of Yorktown Formation (zone 2): **+100 feet above sea level**

Bottomed in saprolite from Petersburg Granite

SC–93–24: On eastern side of Va. State Route 681, 0.1 mile north of the Dinwiddie-Sussex county line, 4.87 miles west of eastern quadrangle border and 5.82 miles north of southern quadrangle border, in northwestern 1/9th of map area (latitude 36.9602° N., longitude 77.4628° W.). Surface elevation 100 feet.

LITHOLOGY DEPTH IN FEET

Windsor Formation

Sand, dominantly fine to medium, but ranges up to very coarse; poorly sorted, clayey, silty, pale yellowish brown (10*YR* 7/2) and yellowish orange (10*YR* 7/6) grading down by 4 feet to pale yellowish brown (10*YR* 6/2)..... 0–9

Sand, fine to medium, silty, grading down to clayey, medium to coarse sand; pinkish gray (5*YR* 7/1); subangular to subrounded quartz pebbles up to 2 cm in diameter present at base..... 9–13

Patuxent Formation

Sand, dominantly medium to coarse, but ranges up to very coarse; kaolinitic; contains subrounded to rounded polished quartz pebbles up to 1 cm in diameter; light bluish gray (5*B* 7/2)..... 13–16

Base of Windsor Formation: **+87 feet above sea level**

Bottomed in Patuxent Formation

SC–93–25: On eastern side of Va. State Route 681, 0.7 mile south of intersection of Va. State Route 681 and Va. State Route 40, 4.36 miles west of eastern quadrangle border and 4.13 miles north of southern quadrangle border, in central 1/9th of map area (latitude 36.9352° N., longitude 77.4537° W.). Surface elevation 115 feet.

LITHOLOGY — DEPTH IN FEET

Upper Bacons Castle Formation (Bahramsville Member)

Gravel containing subrounded to rounded quartz clasts up to 3 cm in diameter; moderate reddish brown (10*R* 4/8) 0–3

Lower Bacons Castle Formation (Varina Grove Member)

Sand, medium to coarse, grading down to coarse to very coarse, silty sand; rounded quartz pebbles at base up to 1 cm in diameter; medium orange (5*Y*R 5/8 to 5*YR* 6/7) 3–8

Silt, very clayey, light gray (*N* 7), 2-inch-thick layer ..... at 8

Sand, medium to coarse, grading down to coarse to very coarse; contains quartz pebbles; moderate reddish brown (10*R* 5/4) 8–15

Chowan River Formation

Silt, very clayey, light greenish gray (5*GY* 8/1); top weathered to pale reddish brown (10*R* 5/4); 3-inch-thick layer ..... at 15

Sand, fine to medium, silty, moderate reddish brown (10*R* 4/6) 15–16

Silt, very clayey, light greenish gray (5*GY* 8/1); 4-inch-thick layer ..... at 16

Sand, very fine to fine, silty, dark yellowish orange (10*YR* 6/6) 16–19

Silt, very clayey, yellowish gray (5*Y* 8/1), 1-cm-thick layer, capping light brown (5*YR* 5/6) to dusky brown (5*YR* 2/2), very fine to fine sand; another yellowish gray, very clayey silt lens, 0.5 inch thick, at base 19–20

Sand, fine to medium, well-sorted, dark yellowish orange (10*YR* 6/6) 20–21

Yorktown Formation (zone 2)

Silt, very clayey, greasy, dark yellowish orange (10*YR* 6/6) in upper 2 feet; medium bluish gray (5*B* 5/1) below that; shelly in basal 4 feet (mostly *Turritella*, some *Mulinia*) 21–36

Sand, very fine to fine, clayey and silty, shelly (more diverse fauna than above); contains scattered medium to coarse sand grains and subrounded to rounded quartz pebbles and discoids up to 3 cm in diameter 36–39

Petersburg Granite

Refusal; no saprolite or rock chips, but property owner showed us granite cores taken 100 yards away from this locality..... at 39

Base of upper Bacons Castle Formation: +112 feet above sea level
Base of lower Bacons Castle Formation: +100 feet above sea level
Base of Chowan River Formation: +94 feet above sea level
Base of Yorktown Formation (zone 2): +76 feet above sea level

Bottomed on Petersburg Granite

SC–93–26: On hill in field, 0.17 mile west of Va. State Route 626 bridge over Mortar Branch, 6.21 miles west of eastern quadrangle border and 7.93 miles north of southern quadrangle border, in northwestern 1/9th of map area (latitude 36.9910° N., longitude 77.4869° W.). Surface elevation 115 feet.

LITHOLOGY DEPTH IN FEET

Upper Bacons Castle Formation (Bahramsville Member)

Sand, very fine to fine, poorly sorted, with some grains ranging up to very coarse; contains subrounded to subangular quartz pebbles up to 1 cm in diameter; yellowish gray (5*Y* 7/2); lower contact gradational 0–7

Sand, dominantly fine to medium, poorly sorted, light brown (5*YR* 5/6) to dark yellowish brown (10*YR* 6/6); lower contact gradational 7–12

Sand, medium to coarse, poorly sorted, very pale yellowish brown (10*YR* 7/2) 12–15

Gravel containing quartz, rounded to subrounded clasts up to 6 cm in diameter at top and up to 9 cm in diameter by base; very clayey and silty, fine to coarse sand matrix; very pale yellowish brown (10*YR* 7/2) 15–22

Petersburg Granite

Saprolite from granite; angular quartz grains in clay matrix; kaolin ghosts of feldspar recognizable; light brown (5*YR* 5/6) grading down to greenish gray (5*G* 6/1) 22–26

Refusal; hit rock and stopped ..... at 26

Base of upper Bacons Castle Formation: **+93 feet above sea level**

Bottomed on Petersburg Granite

SC–93–27: In northeastern quadrant of intersection of Va. State Route 681 and Va. State Route 40, between numbers "9" and "2" of spot elevation label "92," 4.28 miles west of eastern quadrangle border and 4.85 miles north of southern quadrangle border, in central 1/9th of map area (latitude 36.9462° N., longitude 77.4529° W.). Surface elevation 92 feet.

LITHOLOGY DEPTH IN FEET

Windsor Formation

Sand, medium to coarse, grading down to coarse to very coarse by 5 feet; pebbly below 11 feet; no detailed log kept 0–21

Petersburg Granite

Saprolite from granite, sandy (very fine), slightly micaceous, greenish gray (5*G* 6/1) 21–24

Refusal; hit rock and stopped ..... at 24

Base of Windsor Formation: **+71 feet above sea level**

Bottomed on Petersburg Granite

SC–93–28: On northern side of Va. State Route 40, 0.1 mile west of power line, 5.76 miles west of eastern quadrangle border and 4.73 miles north of southern quadrangle border, in west-central 1/9th of map area (latitude 36.9439° N., longitude 77.4788° W.). Surface elevation 131 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, fine, well-sorted, yellowish brown (10*YR* 5/2); road sheet wash(?)	0–2
Sand, very fine to very coarse, silty, granular, dark yellowish orange (10*YR* 6/6) grading down to very pale orange (10*YR* 8/2)	2–9
Gravel containing rounded quartz clasts up to 2 cm in diameter; light brown (5*YR* 6/6)	9–11
Sand, very fine to very coarse, silty; contains rounded quartz pebbles up to 4 cm in diameter; light red (5*R* 6/6)	11–16
Yorktown Formation (zone 2)	
Sand, very fine to fine, light brown (5*YR* 5/6), interbedded with yellowish gray (5*Y* 8/1), very clayey silt	16–21
Sand, very fine to fine, dark bluish gray (5*B* 3/1), interbedded with medium bluish gray (5*B* 5/1), very clayey silt; clay layers thicken downward and sand layers thin until silt predominates over sand	21–29
Petersburg Granite(?)	
Absolute refusal; no recovery of any kind; presumed top of granite	at 29

Base of upper Bacons Castle Formation: **+115 feet above sea level**
Base of Yorktown Formation (zone 2): **+102 feet above sea level**

Bottomed on Petersburg Granite(?)

SC–93–29: On western side of Va. State Route 626 just above number "6" on "146" spot elevation label, northwest of power line crossing, 6.64 miles west of eastern quadrangle border and 5.69 miles north of southern quadrangle border, in west-central 1/9th of map area (latitude 36.9581° N., longitude 77.4947° W.). Surface elevation 146 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine to very coarse, very poorly sorted, silty, granular, dark yellowish orange (10*YR* 5/6)	0–7
Sand, very fine to fine, very clayey, light gray (*N* 7)	7–9
Sand, very fine to very coarse, very poorly sorted, silty, granular, light gray (*N* 7)	9–13
Silt, very clayey, sandy with grains ranging up to very coarse, very pale orange (10*YR* 8/4)	13–17
Silt, very clayey, pale olive (10*Y* 6/2) (17–21 feet) grading down to light olive gray (5*Y* 6/1)	17–30
Yorktown Formation (zone 2)	
Sand, fine, silty, dark yellowish orange (10*YR* 6/6) grading very rapidly to medium bluish gray (5*B* 5/1) and dark bluish gray (5*B* 4/1); shelly below 35 feet (*Mercenaria* and other mollusk shells)	30–39
Gravel containing rounded quartz pebbles up to 3 cm in diameter; dark bluish gray (5*B* 4/1)	39–41
Petersburg Granite(?)	
Refusal; no recovery; presumed top of granite	at 41

Base of lower Bacons Castle Formation: **+116 feet above sea level**
Base of Yorktown Formation (zone 2): **+105 feet above sea level**

Bottomed on Petersburg Granite(?)

SC–93–30: On northern side of Va. State Route 657, 0.97 mile east-northeast of intersection of Va. State Route 657 and Va. State Route 649, 3.30 miles west of eastern quadrangle border and 3.63 miles north of southern quadrangle border, in central 1/9th of map area (latitude 36.9279° N., longitude 77.4346° W.). Surface elevation 125 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine to fine with sparse medium grains, silty; kaolin feldspar sand ghosts present from 6 to 7 feet; grayish orange (10*YR* 7/4) grading down by 2 feet to grayish pink (5*R* 7/2)	0–10
Silt, very clayey, light gray (*N* 7)	10–11
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine to coarse, very poorly sorted, silty, yellowish gray (5*Y* 8/1), grading rapidly down to silty, very fine to very coarse sand; contains subangular to subrounded quartz pebbles up to 1 cm in diameter; near base, color changes to yellowish gray (5*Y* 7/2) and contains quartz pebbles up to 3 cm in diameter	11–21
Sand, very fine to very coarse, very poorly sorted, silty; contains quartz pebbles more rounded than in overlying unit; grayish yellowish orange (10*YR* 7/6) grading down to dark yellowish orange (10*YR* 6/6)	21–24
Yorktown Formation (zone 2)	
Sand, very fine to fine, silty, dark yellowish orange (10*YR* 6/6)	24–25
Silt, clayey, medium gray (*N* 5)	25–41
Gravel containing rounded quartz clasts up to 8.5 cm in diameter; medium gray (*N* 5)	41–48
Patuxent Formation	
Sand, fine to medium; garnet and mica present; grayish red purple (5*RP* 5/2)	48–51
Sand, medium to coarse; contains rounded polished quartz pebbles up to 2 cm in diameter; very light bluish gray (5*B* 8/1)	51–77

Base of upper Bacons Castle Formation: **+114 feet above sea level**
Base of lower Bacons Castle Formation: **+101 feet above sea level**
Base of Yorktown Formation (zone 2): **+77 feet above sea level**

Bottomed in Patuxent Formation

SC–93–31: On southern side of Va. State Route 657, at "120" spot elevation intersection located 1.3 miles east-northeast of intersection of Va. State Route 657 and Va. State Route 649, 2.97 miles west of eastern quadrangle border and 3.76 miles north of southern quadrangle border, in central 1/9th of map area (latitude 36.9301° N., longitude 77.4287° W.). Surface elevation 119 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine to medium, clayey and silty, dark yellowish orange (10*YR* 6/6)	0–2
Silt, very clayey, dense; possible kaolin feldspar-grain ghosts present; light gray (*N* 7)	2–5
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, medium to coarse, silty; quartz pebbles in basal 2 feet; yellowish gray (5*Y* 8/1)	5–19
Yorktown Formation (zone 2)	
Silt, very clayey, medium gray (*N* 5)	19–34
Gravel containing rounded quartz clasts up to 8 cm in diameter; medium gray (*N* 5)	34–43
Patuxent Formation	
Sand(?); recovered some fine to very coarse sand, but most material lost in this interval; light brownish gray (5*YR* 6/1)	43–52
Clay, dense, brownish black (5*YR* 3/1)	52–55

Base of upper Bacons Castle Formation: **+114 feet above sea level**
Base of lower Bacons Castle Formation: **+100 feet above sea level**
Base of Yorktown Formation (zone 2): **+76 feet above sea level**

Bottomed in Patuxent Formation

SC–93–32: On dirt road east of old abandoned house, 0.73 mile west-northwest of crossing of Va. State Route 648 and Seaboard Railroad, 2.96 miles west of eastern quadrangle border and 2.15 miles north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.9063° N., longitude 77.4281° W.). Surface elevation 102 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, fine to medium, yellowish brown (10*YR* 6/4) grading down to light brown (5*YR* 5/6) (2–6 feet), then grading to orangish brown (5*YR* 4/8); coarsens down to	0–11
Sand, medium to coarse; contains subangular to subrounded quartz pebbles up to 1 cm in diameter; orangish brown (5*YR* 4/8); lower contact abrupt	11–13
Upper Bacons Castle Formation (Bahramsville Member)	
Silt, very clayey, dense, sandy (fine), micaceous, light gray (*N* 7) with dark yellowish orange (10*YR* 5/6) mottles	13–16
Silt, sandy, grading down through silty, fine sand to medium to coarse sand that contains quartz granules; grayish orange (10*YR* 7/4); lower contact abrupt	16–22
Lower Bacons Castle Formation (Varina Grove Member)	
Silt, very clayey, sandy, pale yellowish brown (10*YR* 6/2); lower contact somewhat gradational	22–25
Gravel containing subangular to rounded quartz clasts up to 7 cm in diameter, in matrix of medium to coarse sand; dark yellowish orange (10*YR* 6/6)	25–36
Patuxent Formation	
Sand, medium to very coarse, pale yellowish orange (10*YR* 8/6); contains rounded polished quartz pebbles up to 1.5 cm in diameter and pale yellowish brown (10*YR* 6/2) mud balls up to 1 cm in diameter	36–41

Base of Windsor Formation:	**+89 feet above sea level**
Base of upper Bacons Castle Formation:	**+80 feet above sea level**
Base of lower Bacons Castle Formation:	**+66 feet above sea level**

Bottomed in Patuxent Formation

SC–93–33: On eastern side of Va. State Route 630, 0.18 mile north of southern quadrangle border along road, 6.37 miles west of eastern quadrangle border and 0.16 mile north of southern quadrangle border, in southwestern 1/9th of map area (latitude 36.8775° N., longitude 77.4900° W.). Surface elevation 131 feet.

LITHOLOGY DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, very fine to medium, silty and clayey, dark yellowish orange (10*YR* 6/6) grading down to orange (2.5*YR* 5/8) with light gray (*N* 7) mottles; lower contact gradational..... 0–6

Sand, very fine to very coarse, very poorly sorted; contains rare quartz pebbles up to 1 cm in diameter; light brown (5*YR* 5/6); lower contact abrupt..... 6–13

Yorktown Formation (zone 2)

Silt, very clayey, sandy (very fine to fine), dense, pale red (5*R* 6/2)..... 13–14

Silt, sandy (very fine to fine), grading down to silty, very fine to fine sand; very fine dark heavy minerals abundant; light gray (*N* 7), yellowish brown (10*YR* 6/4), and dark yellowish orange (10*YR* 6/6)..... 14–17

Silt, very clayey, dense, light gray (*N* 7) with streaks of black (*N* 1) carbon 17–19

Petersburg Granite

Saprolite from granite, clay with coarse, angular, sand-size quartz and patches of kaolin; crumbly; 5 cm recovered; refusal at base..... at 19

Base of lower Bacons Castle Formation: **+118 feet above sea level**
Base of Yorktown Formation (zone 2): **+112 feet above sea level**

Bottomed on Petersburg Granite

SC–93–34: On southern side of Va. State Route 699, 0.05 mile west of intersection of Va. State Route 699 and Va. State Route 630, 6.87 miles west of eastern quadrangle border and 3.54 miles north of southern quadrangle border, in west-central 1/9th of map area (latitude 36.9268° N., longitude 77.4988° W.). Surface elevation 150 feet.

LITHOLOGY DEPTH IN FEET

Lower Bacons Castle Formation (Varina Grove Member)

Sand, very fine to fine, clayey and silty, grading down to sandy (very fine to fine), very clayey silt; moderate reddish brown (10*R* 4/6) (0–2 feet) grading down to moderate reddish brown (10*R* 4/6) with grayish orange (10*YR* 7/4), light gray (*N* 7), and very light gray (*N* 8) mottles; subrounded quartz pebble 3 cm in diameter in basal foot 0–6

Sand, fine to medium, grayish orangish pink (5*YR* 7/2) grading down to light brown (5*YR* 6/4) and grayish orange (10*YR* 7/4); a few quartz granules concentrated near base 6–13

Petersburg Granite

Saprolite from granite, very dense, grayish pink (5*R* 8/2) and pale reddish purple (5*RP* 6/2) 13–16

Base of lower Bacons Castle Formation: +137 feet above sea level

Bottomed in saprolite from Petersburg Granite

SC–93–35: On dirt road, 0.07 mile west of Va. State Route 640, 0.75 mile south-southwest of intersection of Va. State Route 640 and Va. State Route 662, 1.01 miles west of eastern quadrangle border and 1.24 mile north of southern quadrangle border, in southeastern 1/9th of map area (latitude 36.8931° N., longitude 77.3927° W.). Surface elevation 90 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, medium to coarse; contains subrounded quartz pebbles up to 2 cm in diameter; pale yellowish orange (10*YR* 7/2)	0–7
Silt, very clayey, sandy (fine), light gray (*N* 7)	7–9
Sand, dominantly coarse to very coarse, very pale orange (10*YR* 8/2) grading by 15 feet to dark yellowish orange (10*YR* 6/6) and then to moderate reddish brown (10*R* 4/6)	9–20
Yorktown Formation (zone 2)	
Silt, very clayey, sandy (fine), light gray (*N* 7) grading through medium light gray (*N* 6) to medium gray (*N* 5)	20–28
Gravel containing rounded olive black (5*Y* 2/1) quartz clasts up to 6 cm in diameter, in matrix of clay and sand; medium bluish gray (5*B* 5/1)	28–37
Patuxent Formation	
Sand, mostly coarse to very coarse, but with layers of fine to medium; contains rounded polished quartz pebbles up to 2 cm in diameter; light reddish gray (5*YR* 7/1); 10-cm-thick clay layer at 38 feet, light brownish gray (5*YR* 6/1) mingled with brownish black (5*YR* 2/1)	37–41

Base of Windsor Formation: **+70 feet above sea level**
Base of Yorktown Formation (zone 2): **+53 feet above sea level**

Bottomed in Patuxent Formation

SC–93–36: On northern side of dirt road running east from Va. State Route 649, 0.95 mile west-northwest of crossing of Va. State Route 648 over Seaboard Railroad (at "BM 86"), 3.22 miles west of eastern quadrangle border and 2.06 miles north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.9050° N., longitude 77.4330° W.). Surface elevation 104 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand and very clayey silt; no detailed log kept	0–24
Gravel, dense; no detailed log kept	24–35
Patuxent Formation	
Sand, coarse; contains rounded polished quartz pebbles up to 1.5 cm in diameter; clay balls; very light gray (*N* 8)	35–42

Base of Windsor Formation: **+69 feet above sea level**

Bottomed in Patuxent Formation

SC–93–37: On northern side of dirt road running east from Va. State Route 649, 1.12 miles west of crossing of Va. State Route 648 over Seaboard Railroad (at "BM 86"), 3.40 miles west of eastern quadrangle border and 2.01 miles north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.9043° N., longitude 77.4360° W.). Surface elevation 102 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand and very clayey silt; no detailed log kept	0–27
Gravel, dense; no detailed log kept	27–35
Patuxent Formation	
Silt, very clayey, silty, micaceous, dense, dark brownish black (5*YR* 1/1); underlain by fine to medium sand, light pinkish gray (5*YR* 9/1), garnetiferous	35–42

Base of Windsor Formation: **+67 feet above sea level**

Bottomed in Patuxent Formation

SC–93–38: 660 feet west of SC–93–37, 3.49 miles west of eastern quadrangle border and 2.09 miles north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.9054° N., longitude 77.4381° W.). Surface elevation 102 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand and very clayey silt; no detailed log kept	0–21
Gravel, dense; no detailed log kept	21–32
Petersburg Granite	
Saprolite from granite, dark gray (*N* 4)	32–33
Refusal; spun 5 minutes without progress	at 33

Base of Windsor Formation: **+70 feet above sea level**

Bottomed in saprolite from Petersburg Granite

SC–93–39: 300 feet east of SC–93–38 and 360 feet west of SC–93–37, in south-central 1/9th of map area (latitude 36.9051 ^{o} N., longitude 77.4374 ^{o} W.). Surface elevation 101 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, very clayey silt, and gravel; no detailed log kept	0–29
Gravel, dense, no detailed log kept	29–30
Patuxent Formation	
Sand and gravel with coarse-grained sand matrix; contains quartz clasts up to 4.5 cm in diameter	30–49

Base of Windsor Formation: **+71 feet above sea level**

Bottomed in Patuxent Formation

SC–93–40: 240 feet east of SC–93–38 and 50 feet west of SC–93–39, in south-central 1/9th of map area (latitude 36.9051° N., longitude 77.4375° W.). Surface elevation 101 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand and very clayey silt; no detailed log kept	0–28
Gravel, dense; no detailed log kept	28–31
Patuxent Formation	
Sand, dense; no detailed log kept	31–39
Gravel and coarse-grained sand; contains quartz clasts up to 4.5 cm in diameter	39–66

Base of Windsor Formation: **+70 feet above sea level**

Bottomed in Patuxent Formation

SC–93–41: 118 feet east of SC–93–38 and 122 feet west of SC–93–40, in south-central 1/9th of map area (latitude 36.9052° N., longitude 77.4378° W.). Surface elevation 102 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand and very clayey silt; no detailed log kept	0–28
Gravel, dense; no detailed log kept	28–32
Patuxent Formation	
Sand, coarse, and gravel; contains subrounded to rounded quartz clasts up to 3 cm in diameter, often polished; garnetiferous; very gravelly toward base	32–74
Petersburg Granite	
Saprolite from granite, clay with dark gray (*N* 4), coarse-size, angular quartz; very micaceous, biotitic, dense	74–76

Base of Windsor Formation: **+70 feet above sea level**
Base of Patuxent Formation: **+28 feet above sea level**

Bottomed in saprolite from Petersburg Granite

SC–93–42: 58 feet east of SC–93–38 and 60 feet west of SC–93–41, in south-central 1/9th of map area (latitude 36.9053° N., longitude 77.4379° W.). Surface elevation 102 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand and very clayey silt; no detailed log kept	0–21
Gravel, dense; no detailed log kept	21–33
Patuxent Formation	
Sand, coarse, and gravel; quartz clasts; hard and crunchy drilling	33–58
Petersburg Granite(?)	
Micaceous, clayey, brown layers and micaceous clayey sand on base of stem (saprolite?, soil zone?, fault gouge?); refusal despite full feed	at 58

Base of Windsor Formation: **+69 feet above sea level**
Base of Patuxent Formation: **+44 feet above sea level**

Bottomed on Petersburg Granite(?)

SC–93–43: 28 feet east of SC–93–38 and 30 feet west of SC–93–42, in south-central 1/9thof map area (latitude 36.9054^{o} N., longitude 77.4380^{o} W.). Surface elevation 102 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand and very clayey silt; no detailed log kept	0–22
Gravel, dense; no detailed log kept	22–33
Patuxent Formation	
Sand, micaceous and silty, very light gray (*N* 8)	33–39
Petersburg Granite(?)	
Refusal; no recovery	at 39

Base of Windsor Formation: **+69 feet above sea level**
Base of Patuxent Formation: **+63 feet above sea level**

Bottomed on Petersburg Granite(?)

SC–93–44: At sharp bend in unnumbered road, 0.32 mile south of Green Church Bridge over Nottoway River, 3.51 miles west of eastern quadrangle border and 0.12 mile north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.8781° N., longitude 77.4383° W.). Surface elevation 85 feet.

LITHOLOGY DEPTH IN FEET

Alluvium

Gravel and gravelly sand, includes pebbles, cobbles, and boulders; no detailed log kept 0–25

Patuxent Formation

Sand, medium to coarse, very light gray (*N* 8), kaolin-rich; brownish gray (5*YR* 4/1), clayey, fine to medium sand with fine mica flakes in basal foot 25–32

Base of alluvium: **+60 feet above sea level**

Bottomed in Patuxent Formation

SC–93–45: At sharp bend in unnumbered road leading to Fort Nottoway, 0.28 mile south of Va. State Route 648 where "88" spot elevation is at intersection, 3.21 miles west of eastern quadrangle border and 0.93 mile north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.8887° N., longitude 77.4328° W.). Surface elevation 88 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, pebbly; no soil profile	0–18
Gravel; very tough drilling	18–35
Patuxent Formation	
Sand and gravel; slow and tough drilling; no detailed log kept	35–56
Petersburg Granite	
Saprolite from granite, light gray (*N* 7) clay with black (*N* 1), angular, coarse-size quartz grains	56–60
Refusal	at 60

Base of alluvium: **+53 feet above sea level**
Base of Patuxent Formation: **+32 feet above sea level**

Bottomed on Petersburg Granite

SC–93–46: 0.2 mile southwest of SC–94–44 on side of dirt road (not shown on 1986 quadrangle map) beside right (southeastern) bank of Nottoway River, 3.63 miles west of eastern quadrangle border and 0.03 mile north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.8758° N., longitude 77.4404° W.). Surface elevation 88 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium/Patuxent Formation	
No detailed log kept; bottom part garnetiferous Patuxent sand	0–40

SC–93–47: On unmarked dirt road, 0.1 mile southwest of Va. State Route 681 and 0.12 mile south-southwest of Va. State Route 681 bridge over Black Branch, 5.52 miles west of eastern quadrangle border and 6.78 miles north of southern quadrangle border, in northwestern 1/9th of map area (latitude 36.9737° N., longitude 77.4745° W.). Surface elevation 105 feet.

LITHOLOGY	DEPTH IN FEET
Yorktown Formation (zone 2)	
Silt, clayey, orangish brown (5*YR* 4/8), grading down to dark bluish gray (5*B* 4/1)	0–12
Gravel containing quartz clasts in silt and sand matrix; dark bluish gray (5*B* 4/1)	12–13
Petersburg Granite	
Saprolite from granite; contains feldspar ghosts and angular, clear or black quartz grains	13–21

Base of Yorktown Formation (zone 2): **+92 feet above sea level**

Bottomed in saprolite from Petersburg Granite

Sunbeam Quadrangle

SB–93–1: On southern side of unlabeled N.C. State Road, 0.90 mile south-southeast of Mt. Sinai Church, 3.47 miles west of eastern quadrangle border and 0.61 mile north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.5090° N., longitude 77.0627° W.). Surface elevation 32 feet.

LITHOLOGY — DEPTH IN FEET

Shirley Formation

Sand, very fine, clean and well-sorted, grayish yellow (5*Y* 8/4) grading down to pale yellowish orange (10*YR* 8/6) 0–2

Sand, very fine, dense, clayey, very light gray (*N* 8) with dark yellowish orange (10*YR* 6/6) mottles 2–3

Sand, very fine to fine, silty, loose, micaceous, very light gray (*N* 8) with sparse mottles of dark yellowish orange (10*YR* 6/6); lower contact gradational 3–9

Sand, fine to medium; contains sparse very fine dark heavy minerals; very light gray (*N* 9); basal 3 inches are medium to coarse sand with quartz granules 9–11

Yorktown Formation (zone 2)

Silt, clayey, finely micaceous, greenish gray (5*G* 5/1) 11–15

Silt, sandy with sand fraction mostly fine to medium phosphate, grading down near base to silty, fine to medium quartz sand; shelly below 23 feet (oyster, *Mulinia*, and a few other shells); greenish gray (5*G* 5/1) 15–29

Yorktown Formation (zone 1)

Sand, fine, well-sorted, sparsely shelly, grayish olive (10*Y* 4/2); lower contact abrupt 29–34

Eastover Formation

Sand, fine to medium, clayey, dense, moderately shelly, medium bluish greenish gray (5*BG* 5/1); lower contact gradational 34–39

Sand, fine to medium, clean, dark bluish greenish gray (5*BG* 4/1); lower contact somewhat gradational 39–43

Sand, medium to coarse; contains quartz pebbles (up to 1 cm in diameter), phosphate pebbles, and bone fragments; dark greenish gray (5*G* 4/1) 43–44

Aquia Formation

Sand, fine to medium, mostly fine, glauconitic; contains scattered well-rounded coarse grains; grayish olive green (5*GY* 2/2)..... 44–55

Cape Fear Formation

Sand, medium to coarse, grading down to coarse to very coarse sand; kaolinitic, garnetiferous; contains scattered rounded and polished quartz pebbles up to 0.5 cm in diameter toward top and increasing to 1.5 cm in diameter downward; very light gray (*N* 8)..... 55–66

Silt, very clayey, dense, brownish gray (5*YR* 4/1)..... 66–67

Base of Shirley Formation:	**+21 feet above sea level**
Base of Yorktown Formation (zone 2):	**+3 feet above sea level**
Base of Yorktown Formation (zone 1):	**-2 feet below sea level**
Base of Eastover Formation:	**-12 feet below sea level**
Base of Aquia Formation:	**-23 feet below sea level**

Bottomed in Cape Fear Formation

SB–93–2: In open field, 0.59 mile west-southwest of 33-foot bench mark, 3.57 miles west of eastern quadrangle border and 0.26 mile north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.5038° N., longitude 77.0636° W.). Surface elevation 30 feet.

LITHOLOGY	DEPTH IN FEET
Shirley Formation	
Sand, very fine, clayey	0–2
Sand, very fine to fine, grading down to medium to coarse sand	2–18
Gravel containing quartz pebbles up to 2 cm in diameter, in Matrix of coarse to very coarse sand	18–19
Windsor Formation(?)	
Silt; contains abundant root fragments; dark grayish brown	19–31

Base of Shirley Formation: **+11 feet above sea level**

Bottomed in Windsor Formation(?)

SB–93–3: Under the number "8" in label "BM 81," 0.82 mile south-southeast of New Hope Church, 1.09 miles west of eastern quadrangle border and 2.00 miles north of southern quadrangle border, in southeastern 1/9th of map area (latitude 36.5290° N., longitude 77.0195° W.). Surface elevation 80 feet.

LITHOLOGY DEPTH IN FEET

Windsor Formation

Sand, very fine to fine, silty and clayey, light gray (*N* 7) and orange (10*YR* 6/7) 0–6

Sand, dominantly fine, but silty to very coarse, with increasing clay content downward; contains subrounded quartz granules and pebbles up to 0.5 cm in diameter; very pale orange (10*YR* 8/2) grading down to yellowish orange (10*YR* 7/6) 6–16

Silt, sandy (very fine), greasy, grading through silty, fine sand and silty, fine to medium sand to medium to coarse sand in basal 4 inches that contains subrounded to rounded polished quartz pebbles up to 2 cm in diameter; medium bluish gray (5*B* 5/1) 16–35

Yorktown Formation (zone 2)

Sand, very fine, silty, finely micaceous, grading rapidly down to sandy (very fine) and clayey silt; moderate bluish greenish gray (5*BG* 6/1) 35–53

Silt, sandy (very fine), clayey, shelly (including *Mulinia*, *Turritella*, and scaphopods), greenish gray (5*G* 5/1) 53–61

Base of Windsor Formation: **+45 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

Sussex Quadrangle

SU–93–1: On southeastern side of T-intersection of Va. State Road 640 and Va. State Road 637, 3.04 miles west of eastern quadrangle border and 6.47 miles north of southern quadrangle border, in north-central 1/9th of map area (latitude 36.9700° N., longitude 77.3045° W.). Surface elevation 85 feet.

LITHOLOGY	DEPTH IN FEET
Charles City Formation	
Sand, fine to medium, very clayey, dense and stiff, moderate reddish brown (10*R* 4/6), dark yellowish orange (10*YR* 6/6), and very pale orange (10*YR* 8/2) grading down to mostly yellowish gray (5*Y* 7/2)	0–9
Sand, fine to medium, silty, grayish yellow (5*Y* 8/4)	9–10
Sand, medium to coarse, yellowish orange (10*YR* 7/6)	10–16
Sand, medium to coarse; contains subrounded to rounded quartz pebbles up to 6 cm in diameter; dark yellowish orange (10*YR* 6/6); lower contact gradational	16–22
Sand, coarse to very coarse; contains subrounded to rounded quartz pebbles up to 6 cm in diameter; dark yellowish orange (10*YR* 6/6)	22–41
No recovery (lost stems); drilled like dense gravel	41–50

Base of Charles City Formation: **< +44 feet above sea level**

Bottomed in Charles City Formation

SU–93–2: On eastern side of Va. State Road 735, 0.68 mile north of intersection of Va. State Road 735 and Va. State Road 642, 2.23 miles west of eastern quadrangle border and 1.10 miles north of southern quadrangle border, in southeastern 1/9th of map area (latitude 36.8911° N., longitude 77.2899° W.). Surface elevation 74 feet.

LITHOLOGY	DEPTH IN FEET
Artificial fill, sand, poorly sorted, clayey and silty, dark yellowish brown (10*YR* 5/4)	0–1
Colluvium	
Sand, very fine to fine, grading rapidly down to medium to very coarse sand, soft; yellowish gray (5*Y* 7/2)	1–6
Sand, medium to very coarse, silty, yellowish brown (10*YR* 6/4) with light gray (*N* 7) clay blebs present	6–11
Alluvium	
Silt, clayey, sandy (fine), grading down to silty, very fine sand; medium gray (*N* 5)	11–14
Silt, very clayey, greasy, grading down to sandy (very fine) silt; dark brownish gray (5*YR* 3/1) grading down to olive gray (5*Y* 4/1)	14–18.5
Sand, fine to very coarse, very poorly sorted; contains abundant rounded to angular, olive black (5*Y* 2/1) quartz pebbles up to 1.5 cm in diameter	18.5–19
Yorktown Formation (zone 1)	
Sand, very fine to fine, phosphatic, moderately shelly, grayish olive green (5*GY* 3/2)	19–31
Sand, fine, clean, sparsely shelly, grayish olive green (5GY 3/2); quartz pebble bed at base with clasts up to 3.5 cm in diameter	31–56
Eastover Formation	
Sand, fine to very coarse, very poorly sorted, grayish olive green (5GY 3/2); pebble bed at base with dark- and light-colored, subrounded to rounded quartz pebbles up to 4.5 cm in diameter	56–60

Patuxent Formation

Sand, fine to coarse, poorly sorted, greenish gray (5*GY* 6/1); contains light gray (*N* 7) clay balls and polished rounded quartz pebbles up to 2 cm in diameter..... 60–66

Gravel containing rounded quartz pebbles 0.5 to 1.0 cm in diameter, in matrix of clay; greenish gray (5*GY* 6/1) ..... at 66

Sand, fine to medium, slightly micaceous; subrounded quartz pebbles up to 2 cm in diameter present in basal one-half foot; light bluish gray (5*B* 6/1)..... 66–71

Base of colluvium:	**+63 feet above sea level**
Base of alluvium:	**+55 feet above sea level**
Base of Yorktown Formation (zone 1):	**+18 feet above sea level**
Base of Eastover Formation:	**+14 feet above sea level**

Bottomed in Patuxent Formation

SU–93–3: On eastern side of Va. State Road 735, 0.22 mile north of intersection of Va. State Road 735 and Va. State Road 642, 2.12 miles west of eastern quadrangle border and 0.68 mile north of southern quadrangle border, in southeastern 1/9th of map area (latitude 36.8849° N., longitude 77.2880° W.). Surface elevation 119 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, medium to very coarse, poorly sorted, subrounded, grayish orange (10*YR* 8/4) grading down to moderate reddish orange (10*R* 6/6) with pale yellowish brown (10*YR* 6/2) and grayish orange (10*YR* 7/4) mottles	0–5
Sand, medium to very coarse, clayey; contains scattered quartz granules; pinkish gray (5*YR* 8/1)	5–6
Sand, medium to very coarse, grading down through fine to coarse to very fine to medium sand; poorly sorted; increasingly clayey downward; moderate reddish orange (10*R* 6/6) with pale yellowish brown (10*YR* 6/2) and grayish orange (10*YR* 7/4) mottles	6–10
Silt, very clayey, stiff, little or no sand, light gray (*N* 7) with streaks of pinkish gray (5*YR* 8/1) and blebs of yellowish orange (10*YR* 8/6)	10–13
Silt, very clayey, sandy (very fine to medium), yellowish gray (5*Y* 8/1) with stringers of moderate red (5*R* 5/6) and grayish orange (10*YR* 7/4)	13–16
Sand, medium to very coarse, poorly sorted, grading down to fine to medium sand by base; yellowish orange (10*YR* 7/6)	16–19
Yorktown Formation (zone 2)	
Silt, clayey, massive, pale grayish orange (10*YR* 8/4) grading through dark yellowish orange (10*YR* 6/6) (20–27 feet) to dark yellowish orange (10*YR* 6/6) with grayish orangish pink (5*YR* 7/2) mottles	19–29
Silt, clayey, massive, medium bluish gray (5*B* 5/1)	29–40
Silt, clayey, sandy (very fine), shelly (including *Mulinia* and *Turritella*), medium bluish gray (5*B* 5/1)	40–56

Sand, phosphate-quartz, very fine to fine, silty, clayey, very shelly (including *Chesapecten*, *Mulinia*, and other mollusks), medium greenish gray (5*G* 5/1) 56–60

Yorktown Formation (zone 1)

Sand, quartz-phosphate, fine to coarse, shelly (*Dinocardium*, *Chesapecten*, *Mulinia*, *Teredina*, *Pleuromeris*, oyster, other mollusks, plus barnacles), medium greenish gray (5*G* 5/1) 60–72

Base of upper Bacons Castle Formation: +100 feet above sea level
Base of Yorktown Formation (zone 2): +59 feet above sea level

Bottomed in Yorktown Formation (zone 1)

SU–93–4: On northern side of Va. State Road 642, 50 feet east of prominent south bend in road, 0.64 mile west of eastern quadrangle border and 1.23 miles north of southern quadrangle border, in southeastern 1/9th of map area (latitude 36.8929° N., longitude 77.2595° W.). Surface elevation 119 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine to very coarse, very poorly sorted, silty; contains scattered quartz granules and abundant coarse flakes of silvery mica; grayish orange (10*YR* 7/4) in upper foot, grading down to light brown (5*YR* 5/6) and red (5*R* 5/7) with very light gray (*N* 8) streaks below 3 feet	0–6
Sand, as above, but very clayey, very light gray (*N* 8)	at 6
Sand, very fine to very coarse, very poorly sorted, silty; contains scattered quartz granules and pebbles up to 0.5 cm in diameter; scattered sparse dark heavy minerals and abundant coarse flakes of silvery mica; moderate reddish orange (10*R* 6/6)	6–14
Sand, coarse to very coarse; contains quartz granules and subangular to subrounded pebbles up to 1 cm in diameter; moderate orange pink (5*YR* 8/4)	14–15
Yorktown Formation (zone 2)	
Silt, sandy (very fine), clayey, dark yellowish orange (10*YR* 6/6) with moderate brown (5*Y* 4/4) mottles composed of pseudoplinthite, grading rapidly down to dark yellowish orange (10*YR* 6/6)	15–16

Base of upper Bacons Castle Formation: **+104 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

SU–93–5: On western side of Va. State Road 641, 50 feet south of Hunting Quarter Swamp at site of Howells Mill, 4.28 miles west of eastern quadrangle border and 0.95 mile north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.8889° N., longitude 77.3305° W.). Surface elevation 86 feet.

LITHOLOGY	DEPTH IN FEET
Artificial fill; dense clayey sand	0–3
Alluvium	
Sand, fine to very coarse, very poorly sorted; contains subangular quartz granules and pebbles up to 1 cm in diameter; grayish orange (10*YR* 7/4)	3–5
Yorktown Formation (zone 2)	
Silt, sandy (very fine), clayey, light brown (5*YR* 7/6) grading down rapidly to light gray (*N* 8) with dark yellowish orange (10*YR* 6/6) mottles	5–11
Silt, sandy (very fine), slightly clayey, very finely micaceous; waxy clay lumps present at 17–19 feet; bluish gray (5*B* 5/1)	11–19
Sand, very fine, grading down through fine to medium sand; clayey, silty, very shelly (mostly *Mulinia* at top, but includes *Chesapecten*, *Mercenaria*, *Turritella*, *Pleuromeris* and oyster downward); bluish greenish gray (5*BG* 5/1)	19–26
Yorktown Formation (zone 1)	
Sand, quartz-phosphate, fine to medium; calcite-cemented lumps abundant; sparsely shelly (including *Chesapecten*, *Pleuromeris*, oyster, and barnacles), medium greenish gray (5*GY* 5/1)	26–42
Eastover Formation	
Sand, very fine to fine, well-sorted, sparsely shelly, dark greenish gray (5*G* 4/1)	42–49
Sand, mostly fine but with a minor medium to coarse fraction; contains subrounded quartz pebbles and discoids up to 5 cm in diameter; shelly, greenish gray (5*G* 5/1)	49–58

Patuxent Formation

Sand, medium to very coarse but mostly coarse; contains rounded quartz pebbles up to 1.5 cm in diameter and sand-size garnets; light bluish gray (5*B* 7/1) 58–61

Silt, clayey, sandy (very fine); contains waxy clay lumps and medium sand-size silvery mica flakes; grades down to silty, very fine sand with abundant large silvery mica flakes; greenish gray (5*G* 7/1)..... 61–66

Base of alluvium: **+81 feet above sea level**
Base of Yorktown Formation (zone 2): **+60 feet above sea level**
Base of Yorktown Formation (zone 1): **+44 feet above sea level**
Base of Eastover Formation: **+28 feet above sea level**

Bottomed in Patuxent Formation

SU–93–6: On northern side of Va. State Road 642 and western side of unnumbered dirt road, 1.13 miles west of Sharon Church, 4.79 miles west of eastern quadrangle border and 0.22 mile north of southern quadrangle border, in southwestern 1/9th of map area (latitude 36.8783° N., longitude 77.3361° W.). Surface elevation 129 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, medium to very coarse, poorly sorted, silty, slightly clayey in lower half; contains subangular to subrounded granules and pebbles of quartz; orange (7.5*YR* 5/7) grading down by 3 feet to variegated moderate orange pink (5*YR* 8/4), light brown (5*YR* 5/6), and moderate reddish orange (10*R* 6/6)	0–9
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine, grading down to fine sand; clayey and silty; contains scattered large flakes of silvery mica; moderate red (5*R* 5/4) grading down to pale reddish brown (10*R* 5/4)	9–12
Sand, fine; contains abundant rounded clay balls up to 3 cm in diameter; pale reddish brown (10*R* 5/4) with pale reddish purple (5*RP* 6/2) mud balls	12–13
Sand, fine to very coarse, poorly sorted, grading through medium to very coarse to medium to coarse by base, micaceous, pale violet (10*RP* 6/4)	13–17
Chowan River Formation	
Silt, clayey, sandy (very fine), micaceous, pale reddish purple (5*RP* 6/2) with stringers of very light gray (*N* 8)lower contact gradational	17–19
Sand, very fine to fine, silty; contains coarse flakes of silvery mica and scattered rounded coarse grains; pale reddish purple (5*RP* 6/2) with stringers of very light gray (*N* 8); lower contact gradational	19–22
Sand, fine to medium, silty; contains scattered, rounded, coarse grains; moderate orangish pink (10*R* 7/4)	22–27
Sand, dominantly medium to coarse, moderate orangish pink (5*YR* 8/4 to 10*R* 7/4) and moderate reddish orange (10*R* 6/6)	27–29

Sand, medium to coarse, interbedded with sandy (very fine to fine) silt; moderate orangish pink (5*YR* 8/4 to 10*R* 7/4) and moderate reddish orange (10*R* 6/6)..... 29–33

Sand, medium to coarse, grading down to medium to very coarse, dominantly subrounded sand; contains quartz pebbles up to 1.5 cm in diameter, increasingly abundant toward base; dark yellowish orange (10*YR* 6/7)..... 33–37

Yorktown Formation (zone 2)

Silt, sandy (very fine), clayey; contains sparse very fine silvery mica; dark yellowish orange (10*YR* 6/7) grading through light brown (5*YR* 6/4) (40–41 feet) and dark yellowish orange (10*YR* 6/6) (41–42 feet) to bluish greenish gray (5*BG* 5/1)..... 37–46

Base of upper Bacons Castle Formation: +120 feet above sea level
Base of lower Bacons Castle Formation: +112 feet above sea level
Base of Chowan River Formation: +92 feet above sea level

Bottomed in Yorktown Formation (zone 2)

SU–93–7: On western side of T-intersection of unnumbered road with Va. State Road 642, across Va. State Road 642 from Sharon Church, 3.65 miles west of eastern quadrangle border and 0.15 mile north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.8772° N., longitude 77.3159° W.). Surface elevation 124 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, fine to very coarse, poorly sorted, silty, dark yellowish orange (10*YR* 6/6)	0–2
Sand, medium to very coarse, clayey; contains subangular to subrounded quartz granules and pebbles up to 0.5 cm in diameter, increasingly abundant downward; yellowish gray (5*Y* 8/1) and very light gray (*N* 8)	2–7
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, very fine, clayey and silty, dense, stiff, micaceous; contains clay balls at 11–12 feet and scattered, coarse to very coarse quartz grains below that; yellowish gray (5*Y* 9/1) with light brown (5*YR* 5/6) mottles	7–15
Sand, medium to very coarse, poorly sorted, grading down to well-sorted, medium sand; contains very fine dark heavy mineral grains; dark yellowish orange (10*YR* 6/7)	15–19
Chowan River Formation	
Sand, very fine, silty and clayey, very pale orange (10*YR* 9/2)	19–20
Sand, medium to coarse, pale yellowish orange (10*YR* 8/6)	20–22
Sand, fine to medium, grading down to medium to Coarse sand; contains very fine dark heavy mineral grains; very pale gray (*N* 9) grading down to very pale yellowish orange (10*YR* 9/2)	22–25

Yorktown Formation (zone 2)

Silt, sandy (very fine), clayey, dark yellowish orange (10*YR* 6/6) and light brown (5*YR* 5/6) 26–27

Silt, sandy (very fine), clayey; very fine silvery mica abundant; medium bluish greenish gray (5*BG* 5/1) 27–36

Base of upper Bacons Castle Formation: **+117 feet above sea level**
Base of lower Bacons Castle Formation: **+105 feet above sea level**
Base of Chowan River Formation: **+99 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

SU–93–8: On western side of Va. State Road 626, 0.26 mile north-northeast of T-intersection of Va. State Road 626 and Va. State Road 637, 1.38 miles west of eastern quadrangle border and 3.79 miles north of southern quadrangle border, in east-central 1/9th of map area (latitude 36.9306° N., longitude 77.2745° W.). Surface elevation 110 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, fine to coarse, grading down to medium to very coarse sand; poorly sorted, silty and clayey; subangular to subrounded granules and pebbles of quartz up to 1 cm in diameter abundant; moderate yellowish brown (10*YR* 5/4) grading down to orange (5*YR* 5/7); very light gray (*N* 8) clay balls up to 4 cm in diameter present in basal foot	0–10
Sand, medium to coarse, silty and clayey, reddish brown (10*R* 5/6)	10–14
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), grayish orange (10*YR* 7/4) grading down to very pale orange (10*YR* 7/2)	14–20
Silt, clayey, sandy (very fine); contains abundant small waxy clay balls up to 1 cm in diameter; very pale orange (10*YR* 7/2)	20–21
Silt, clayey, sandy (very fine); root fragments present; very pale orange (10*YR* 7/2) grading down to orange (5*YR* 6/7)	21–24
Sand, very fine, silty; contains very fine silvery mica flakes; medium bluish gray (5*BG* 5/1)	24–31

Base of upper Bacons Castle Formation: **+96 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

SU–93–9: On western side of unnumbered road, 0.06 mile north of Va. State Road 662, 0.97 mile west-northwest of Hunting Quarter Church, 6.40 miles west of eastern quadrangle border and 1.89 miles north of southern quadrangle border, in southwestern 1/9th of map area (latitude 36.9025° N., longitude 77.3658° W.). Surface elevation 119 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, very fine to very coarse, very poorly sorted, silty; contains subangular granules and pebbles of quartz up to 1.5 cm in diameter; grayish orange (10*YR* 7/4) grading down to dark yellowish orange (10*YR* 6/6)	0–7
Silt, clayey, sandy (very fine to fine); contains scattered angular to subangular granules of quartz and medium-size flakes of silvery mica; variegated very light gray (*N* 8), light red (5*R* 6/6), and moderate reddish brown (10*R* 5/7); lower contact somewhat gradational	7–20
Sand, very fine to coarse, grading down to medium to very coarse sand; poorly sorted, very silty, slightly clayey, light brown (5*YR* 6/6)	20–22
Yorktown Formation (zone 2)	
Silt, sandy (very fine); contains very fine silvery mica flakes; orange (5*YR* 5/7) in upper 3 inches grading down rapidly to medium bluish greenish gray (5*BG* 5/1)	22–26

Base of upper Bacons Castle Formation: **+97 feet above sea level**

Bottomed in Yorktown Formation (zone 2)

SU–93–10: On eastern side of Va. State Road 637, 0.05 mile south of northern quadrangle border, 4.22 miles west of eastern quadrangle border and 8.50 miles north of southern quadrangle border, in north-central 1/9th of map area (latitude 36.9996° N., longitude 77.3266° W.). Surface elevation 67 feet.

LITHOLOGY	DEPTH IN FEET
Lower Bacons Castle Formation (Varina Grove Member)	
Sand, fine to very coarse, very poorly sorted, gravelly; quartz pebbles up to 6 cm in diameter present; very pale orange (10*YR* 8/2) to dark yellowish orange (10*YR* 6/6)	0–6
Sand, fine to very coarse, very poorly sorted, very pale orange (10*YR* 8/2) to dark yellowish orange (10*YR* 6/6); contains moderate brown (5*YR* 3/4) and light brown (5*YR* 6/4) mud balls	6–10
Sand, fine to very coarse, very poorly sorted; contains scattered quartz pebbles up to 3 cm in diameter at top, clasts become more abundant below 23 feet and up to 5 cm in diameter; dark yellowish orange (10*YR* 6/6); large pale yellowish brown (10*YR* 6/2) and white (*N* 9) clay ball at 22 feet	10–30.5
Patuxent Formation	
Sand, medium to very coarse, poorly sorted, subrounded; kaolinitic silt abundant; very pale orange (10*YR* 9/2) and white (*N* 9)	30.5–31

Base of lower Bacons Castle Formation: **+36.5 feet above sea level**

Bottomed in Patuxent Formation

SU–93–11: At locality of 94-foot spot elevation, 0.12 mile west of eastern quadrangle border and 8.41 miles north of southern quadrangle border, in northeastern 1/9th of map area (latitude 36.9993° N., longitude 77.2518° W.). Surface elevation 94 feet.

LITHOLOGY	DEPTH IN FEET
Windsor Formation	
Sand, very fine to fine, silty, orange (5*YR* 5/8)	0–6
Sand, very fine to fine, silty; contains coarse silvery mica flakes; reddish brown (10*R* 5/7)	6–13
Silt, sandy (very fine), clayey, light brown (5*YR* 5/6) and moderate reddish orange (10*R* 6/6)	13–25
Sand, very fine to fine, light brown (5*YR* 5/6) and moderate reddish orange (10*R* 6/6)	25–28
Yorktown Formation (zone 1)	
Sand, quartz-phosphate, very fine to medium, dominantly fine, silty; contains scattered calcite-cemented lumps and oyster fragments; detrital fragment of *Isognomon* at base; yellowish brown (10*YR* 5/4) grading down to yellowish gray (5*Y* 7/2)	28–43
Eastover Formation	
Sand, fine, well-sorted, dusky yellow (5*Y* 6/4)	43–48
Sand, fine, well-sorted; contains subrounded to rounded quartz pebbles up to 7 cm in diameter; dark greenish gray (5*GY* 5/2)	48–53

Base of Windsor Formation: **+66 feet above sea level**
Base of Yorktown Formation (zone 1): **+51 feet above sea level**

Bottomed in Eastover Formation

SU–93–12: 0.10 mile west of 70-foot spot elevation on Va. State Road 640, 0.64 mile north-northeast of intersection of Va. State Road 640 and Va. State Road 40, 6.27 miles west of eastern quadrangle border and 4.65 miles north of southern quadrangle border, in west-central 1/9th of map area (latitude 36.9426° N., longitude 77.3629° W.). Surface elevation 81 feet.

LITHOLOGY	DEPTH IN FEET
Holocene dune sand	
Sand, fine to medium; includes bits of brick and mortar; moderate brown (5*YR* 4/4)	0–2
Sand, fine, well-sorted; abundant medium fraction, no silt or clay; dark yellowish orange (10*YR* 6/6) with dark yellowish brown (5*YR* 4/2) streaks in basal foot	2–9
Alluvium	
Sand, very fine to medium, poorly sorted, very silty and clayey, very micaceous, light;brown (5*YR* 5/6); lower contact gradational	9–13
Sand, very fine to medium, poorly sorted; sparse silt and clay; sparse mica; grayish orange (10*YR* 8/4)	13–17
Sand, very fine to medium, poorly sorted, silty; mica abundant; grayish orange (10*YR* 8/4)	17–19
Sand, medium to very coarse; contains subangular to subrounded quartz pebbles up to 1 cm in diameter; light brown (5*YR* 5/6)	19–21

Base of Holocene dune sand: **+72 feet above sea level**

Bottomed in alluvium

SU–93–13: On northwestern side of Va. State Road 626, at entrance to dirt road, 0.12 mile west of eastern quadrangle border and 8.52 miles north of southern quadrangle border, in northeastern 1/9th of map area (latitude 36.9933° N., longitude 77.2519° W.). Surface elevation 56 feet.

LITHOLOGY	DEPTH IN FEET
Alluvium	
Sand, fine, well-sorted, silty, yellowish gray (5*Y* 8/2)	0–2
Sand, fine to medium, clayey and silty, loose, light gray (*N* 7) with dark yellowish orange (10*YR* 6/6) mottles; streaks of dark yellowish brown (5*YR* 4/2) in basal foot	2–6
Sand, medium to coarse, grading down to medium to very coarse sand; light gray (*N* 7); lower contact gradational	6–12
Gravel containing subangular to subrounded pebbles of quartz up to 4 cm in diameter; fine to very coarse, very poorly sorted sand matrix; pale bluish green (5*BG* 8/2)	12–17
Patuxent Formation	
Sand, medium to coarse, clayey and silty; contains polished quartz pebbles up to 1 cm in diameter; greenish gray (5*G* 6/1); contains a 10-cm-diameter, brownish gray (5*YR* 4/1), silty clay ball	17–23

Base of alluvium: **+39 feet above sea level**

Bottomed in Patuxent Formation

SU–99–14: On southeastern side of Va. State Road 670, on eastern side of dirt road, 6.62 miles west of eastern quadrangle border and 5.89 miles north of southern quadrangle border, in northwestern 1/9th of map area (latitude 36.9604° N., longitude 77.3694° W.). Surface elevation about 80 feet.

LITHOLOGY	DEPTH IN FEET
Charles City Formation	
Sand, fine to very coarse, tough and clayey, pebbly, pale yellowish brown (5*YR* 6/2) grading down to dark yellowish orange (10*YR* 6/6) with pale olive gray (5*Y* 6/2) mottles	0–1
Sand, medium to very coarse, clayey and silty; contains quartz granules and pebbles up to 1 cm in diameter; dense, pale orange (10*YR* 7/2)	1–8
Yorktown Formation (zone 2)	
Silt, clayey, sandy (very fine), dense, grayish yellow (5*Y* 7/4) with streaks of dark yellowish orange (10*YR* 6/6)	8–11
Eastover Formation	
Silt, clayey; contains scattered, very fine to coarse quartz grains; sticky, grayish yellow (5*Y* 7/4) grading down to grayish orange (10*YR* 6/4)	11–19
Sand, very fine, silty, medium olive gray (5*Y* 4/2)	19–22
Gravel containing subrounded to rounded quartz clasts in matrix of fine sand; grayish olive (10*Y* 5/2)	22–27
Patuxent Formation	
Sand, medium to very coarse, slightly clayey; contains subrounded to rounded granules and pebbles of quartz up to 1 cm in diameter; pale brownish gray (5*YR* 7/1)	27–31

Base of Charles City Formation: **+72 feet above sea level**
Base of Yorktown Formation (zone 2): **+69 feet above sea level**
Base of Eastover Formation: **+53 feet above sea level**

Bottomed in Patuxent Formation

Yale Quadrangle

YA–93–1: On northern side of Va. State Road 609, 0.93 mile west of T-intersection of Va. State Road 609 and Va. State Road 735, 2.80 miles west of eastern quadrangle border and 2.70 miles north of southern quadrangle border, in south-central 1/9th of map area (latitude 36.7894° N., longitude 77.3000° W.). Surface elevation 99 feet.

LITHOLOGY	DEPTH IN FEET
Upper Bacons Castle Formation (Bahramsville Member)	
Sand, dominantly very fine to fine with scattered grains of coarse to very coarse sand; silty and clayey; pale yellowish brown (10*YR* 6/2) grading down to dark yellowish orange (10*YR* 6/6)	0–1
Sand, fine to coarse, poorly sorted, modally coarsens downward, silty and clayey, orange (10*YR* 5/6) with streaks of yellowish gray (5*Y* 7/2)	1–6
Sand, fine to medium, grading down to medium to coarse sand; subangular to subrounded, silty; orange (10*YR* 5/6) grading abruptly at 12 feet to dark yellowish brown (10*YR* 3/2) (4-inch-thick zone) and then grading down abruptly to dark grayish orange (10*YR* 6/4)	6–16
Yorktown Formation (zone 2)	
Silt, clayey, sticky, greasy; top foot orange (10*YR* 5/6) grading rapidly to greenish gray (5*GY* 4/1) and then gradually to medium olive gray (5*Y* 5/1) by 20 feet	16–46
Sand, very fine, grading down to medium to coarse sand in basal foot; silty, clayey; rounded phosphate pebbles up to 1 cm in diameter at base; medium olive gray (5*Y* 5/1)	46–52
Yorktown Formation (zone 1)	
Sand, quartz-phosphate, fine to coarse, silty, slightly clayey; shell fragments abundant; contains occasional calcite-cemented lumps; medium greenish gray (5*GY* 5/1)	52–56

Eastover Formation

Sand, fine with minor medium fraction, slightly silty, clean, sparsely shelly, moderate olive gray (5*Y* 4/2) 56–77

Sand, medium to coarse, slightly silty, moderate olive gray (5*Y* 4/2) 77–78

Gravel containing rounded quartz pebbles up to 3 cm in diameter; moderate olive gray (5*Y* 4/2) 78–82

Patuxent Formation

Sand, medium to very coarse, poorly sorted, silty, slightly clayey; contains subangular to subrounded quartz granules and sparse subrounded quartz pebbles up to 1 cm in diameter; pale brownish gray (5*YR* 7/1) 82–86

Base of upper Bacons Castle Formation: **+83 feet above sea level**
Base of Yorktown Formation (zone 2): **+47 feet above sea level**
Base of Yorktown Formation (zone 1): **+43 feet above sea level**
Base of Eastover Formation: **+17 feet above sea level**

Bottomed in Patuxent Formation

YA–06–2: Along dirt road across Raccoon Creek on northeastern side of creek at foot of valley wall, 0.50 mile east of western quadrangle border, in northwestern 1/9th of map area (latitude 36.8423° N., longitude 77.3658° W.). Surface elevation 99 feet.

LITHOLOGY	DEPTH IN FEET
Colluvium	
Sand, very fine to fine, silty, pale yellowish gray (5*Y* 7/2) grading down throughdark yellowish orange (10*YR* 6/6) to light olive gray (5*Y* 5/2)	0–1
Yorktown Formation (zone 2)	
Sand, very fine, silty, slightly clayey, dark yellowish brown (10*YR* 4/2) grading down through light olive gray (5*Y* 5/2) to greenish gray (5*GY* 6/1)	1–4
Silt, clayey, sandy (very fine), olive (10*Y* 5/2)	4–6
Silt, clayey, sandy (very fine); contains abundant pseudoplinthite nodules; yellowish gray (5*Y* 6/2) with dark yellowish orange (10*YR* 5/6) mottles	6–11
Silt, clayey, sandy (very fine); contains sparse *Mulinia* and *Turritella*; medium greenish gray (5*GY* 5/1)	11–34
Sand, very fine to fine, shelly; fauna more diverse than above; contains scattered subrounded quartz pebbles up to 4 cm in length; greenish gray (5*G* 6/1)	34–37
Gravel composed of quartz clasts up to 6 cm in diameter, stained medium dark gray (*N* 4)	37–42
Patuxent Formation	
Wood, carbonized; contains masses of pyrite with woody pattern on external surfaces; pyrite contains fine to medium sand composed of strained and fractured quartz and exceptionally fresh microcline; blackish red (5*R* 1/2)	42–45
Sand, medium to coarse, subangular to subrounded, silty, dense; contains rounded quartz granules and pebbles up to 0.5 cm in diameter; dark greenish gray (5*G* 4/1)	45–46

Base of Yorktown Formation (zone 2): **+57 feet above sea level**

Bottomed in Patuxent Formation

Supplementary Basement Data

Basement elevation (in feet)	Latitude	Longitude	Well name	Data source
–752	36.5072 N.	77.0058 W.	EHNR Como	North Carolina Geological Survey geophysical database[1].
<–689	36.6579 N.	77.0076 W.	USGS 363928077002701 54B 2	NWIS Web Data for Virginia[2].
–678	36.9793 N.	77.0057 W.	J. Roszel, T.W. Spain	Trapp (1992), p. G55.
–448	36.9785 N.	77.1505 W.	Va. State Water Control Board S.O.W. 48	Trapp (1992), p. G55.
–35	36.9433 N.	77.3993 W.	"Stoney" Creek	Trapp (1992), p. G55.
–123	36.5014 N.	77.4153 W.	NC–NOR–T–10	Brown and others (1972), pl. 31.
–150	36.5223N.	77.3730 W.	NC–NOR–T–9	Brown and others (1972), pl. 31.
–235	36.5417 N.	77.3167 W.	NC–NOR–T–8	Brown and others (1972), pl. 31.
–340	36.5847 N.	77.2001 W.	VA–SO–P–3	Brown and others (1972), pl. 31.

[1]Web site located at:
http://www.ncwater.org/Data_and_Modeling/Ground_Water_Databases/

[2]Web site located at:
http://waterdata.usgs.gov/va/nwis/