SUBSURFACE CORRELATIONS BASED ON SELECTED WELL LOGS FROM THE EASTERN SHORE PENINSULA, VIRGINIA

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EXPLANATORY TEXT

The U. S. Geological Survey, in cooperation with the Virginia Division of Geology, conducted a program of exploratory test drilling in the summer of 1953 in connection with an investigation of the geology and ground-water resources of the Eastern Shore peninsula, Accomack and Northampton Counties.

Drill cuttings with their contained fossils were studied by paleontologists of the U. S. Geological Survey. Miss Ruth Todd studied the Foraminifera, and Mr. I. G. Sohn studied the ostracodes from the samples (Todd and others, 1955). Although the Pleistocene-Miocene contact was tentatively determinable on the basis of the Foraminifera, adequate subdivision of the Miocene was not possible; the study of the ostracodes yielded no correlations. Later, mollusks and other megafossils from the samples were studied by Mr. F. Stearns MacNeil. Fairly definite formational contacts were chosen by MacNeil from his study (personal communication, 1955), and the authors gratefully acknowledge his assistance in connection with the stratigraphic problems of the peninsula.

Figure 1 is an index map of the Virginia Coastal Plain, showing the Eastern Shore peninsula and the locations of the wells, the logs of which are given in Table 1.

Lithologic descriptions of drill cuttings and MacNeil's correlations of strata penetrated in four U. S. Geological Survey test holes (wells 1, 2, 3, and 5) and of another test hole drilled for the Machipongo High School in Northampton County (well 4), are given in Table 1. The lithologic descriptions have appeared in an earlier publication by the present authors (Sinnott and Tibbitts, 1955).

Figure 2 presents stratigraphic columns for these test holes north-northeastward along the Eastern Shore peninsula, on the basis of the correlations by MacNeil given in Table 1. This illustration shows diagrammatically the changes in thickness of the several stratigraphic units.

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Sinnott, Allen, and Tibbitts, G. C., Jr., 1955, Records of selected wells on the Eastern Shore peninsula, Virginia: Virginia Div. Geology, Min. Res. Circ. No. 3, 39 p.

Todd, Ruth, Gardner, J. A., and Sohn, I. G., 1956, Fossils from bore holes on the Eastern Shore peninsula, Virginia: U. S. Geol. Survey open-file report, 11 p.

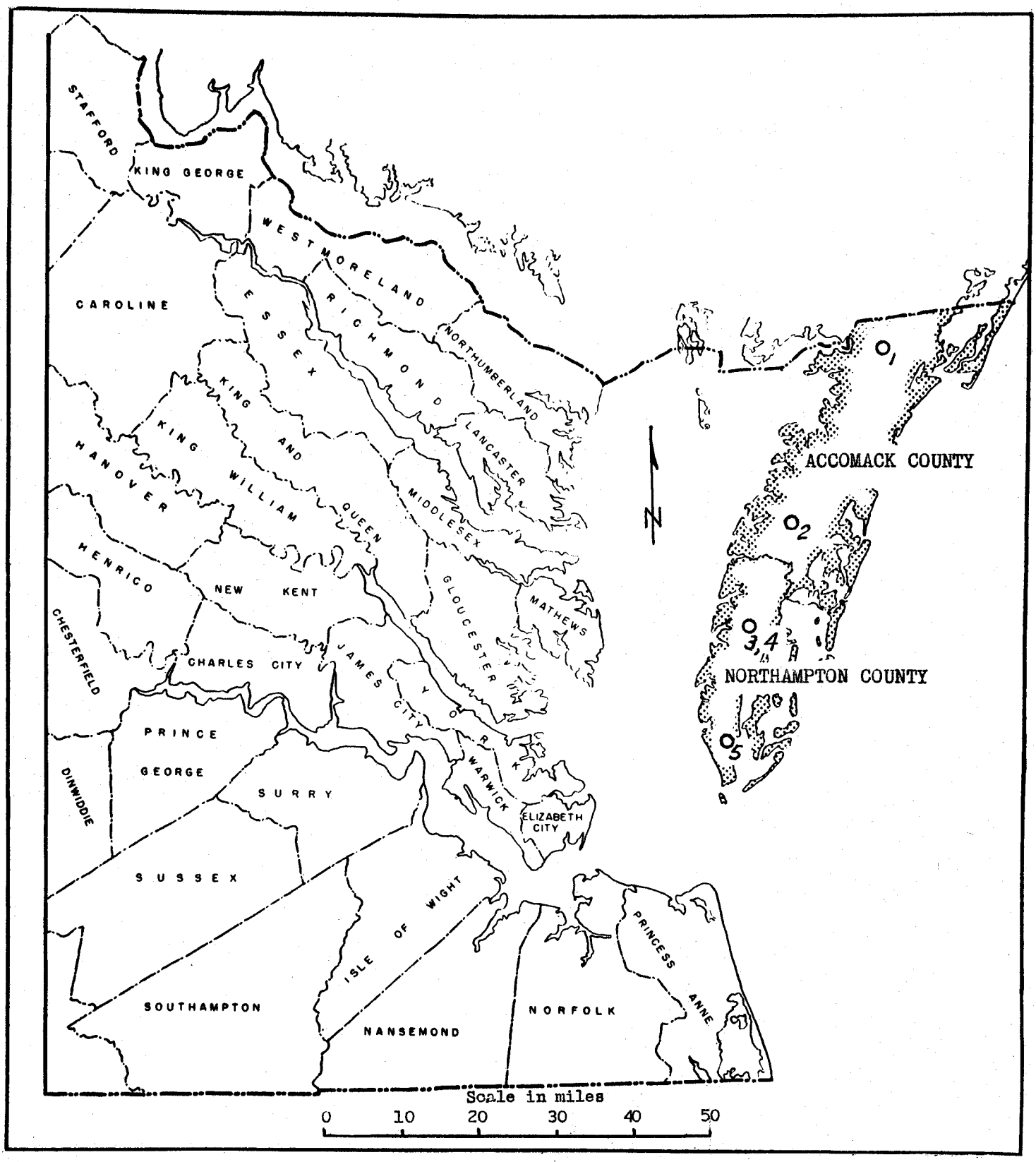

Figure 1.--Index map of the Virginia Coastal Plain, showing the Eastern Shore peninsula and locations of wells, the logs of which are given in Table 1.

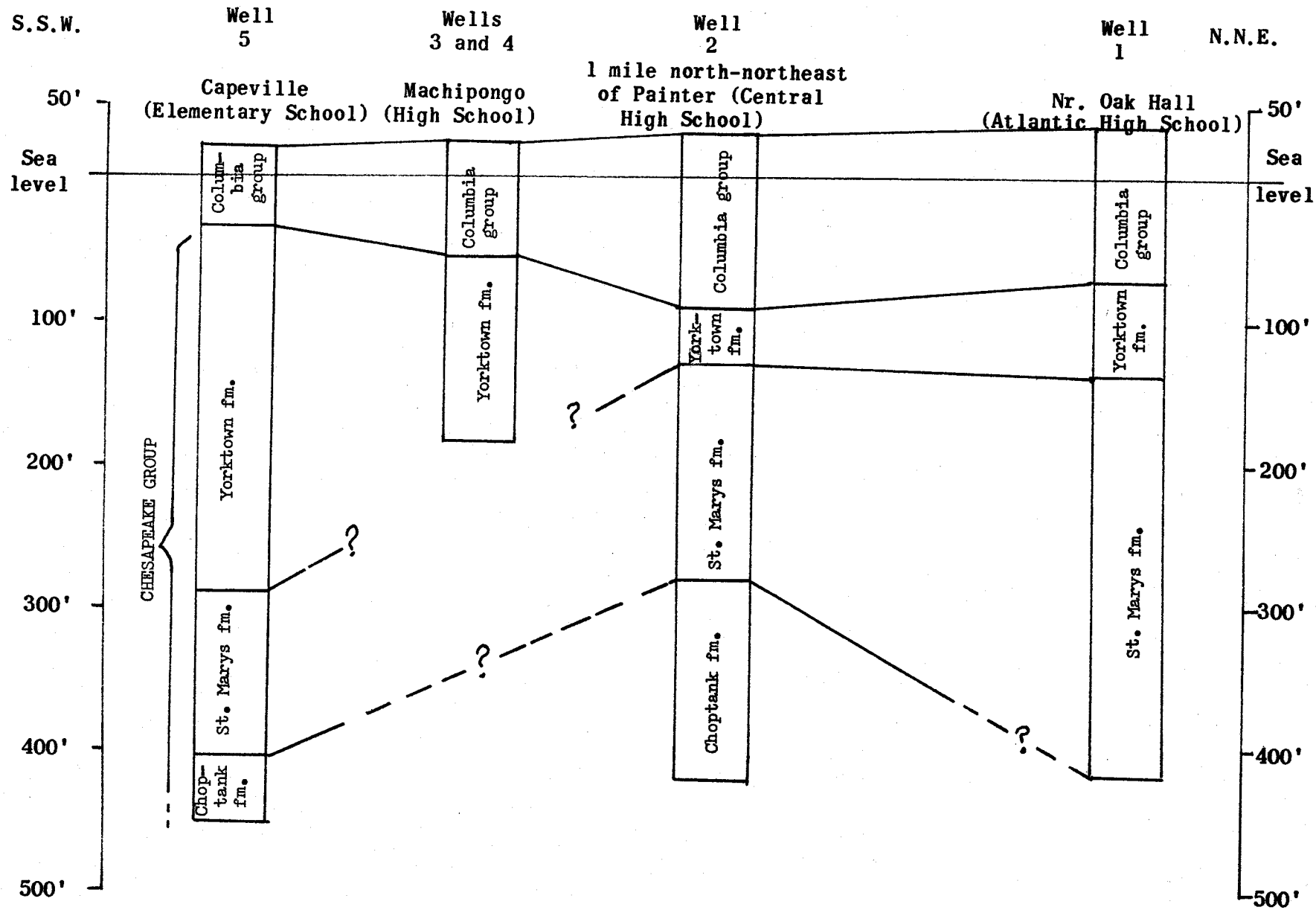

Figure 2.--Diagrammatic correlation of stratigraphic columns along the Eastern Shore peninsula, Virginia, from correlations by F. Stearns MacNeil.

Table 1.--Logs of wells on the Eastern Shore peninsula, Virginia

Well 1 (U.S.G.S. test hole 4); Atlantic High School, near Oak Hall, Accomack County

(Drilled by Sydnor Pump & Well Co., Inc.)

(Log by G. C. Tibbitts, Jr.; correlations by F. Stearns MacNeil)

Altitude 35 feet

	Thickness (feet)	Depth (feet)
Columbia group (Pleistocene):		
Topsoil, light-yellow, fine sandy	7	7
Sand, iron-stained and white; quartz, fine to coarse; streaks of small gravels from 7 to 35 feet; black sand; scattered streaks of gray silt; layer of heavy blue clay 27 to 28 feet; specks of brown clay from 35 feet; water-bearing zone	46	53
Clay, gray-green, soft; abundant fine sand; abundant silt; black sand; scattered shell fragments from 60 feet	20	73
Clay, gray-green, soft; interbedded coarse iron-stained sand; scattered shell fragments	3	76
Clay, dark gray-green, solid; very fine quartz sand; shell fragments; solid streaks of shells 104 feet	29	105
Chesapeake group (Miocene):		
Yorktown formation:		
Clay, dark gray-green, solid; very fine quartz sand; shell fragments; silty from 110 feet; medium gravels from 115 feet; streak of large gravels at 129 to 130 feet, and 145 to 147 feet	45½	150½
Sand, white, medium; abundant shell fragments; clay; water-bearing zone	6½	157
Clay, gray-green, soft; abundant sand; 3-inch marl streak at 167 feet; scattered shell fragments from 175 feet; streaks of fine quartz sand from 150 to 175 feet	18	175
St. Marys formation:		
Clay, gray-green, soft; abundant sand; streaks of fine quartz sand from 175 to 195 feet; black organic specks; abundant black sand from 200 feet	30	205

Table 1.--Logs of wells on the Eastern Shore peninsula, Virginia--Continued

Well 1 (U.S.G.S. test hole 4); Atlantic High School, near Oak Hall, Accomack County--Continued

	Thickness (feet)	Depth (feet)
Chesapeake group (Miocene):--Continued		
St. Marys formation:--Continued		
Shells, white, broken; abundant clay and silt to 215 feet; abundant black sand; black organic specks; 6-inch streak of marl at 227½ feet; possible water-bearing zone	35	240
Sand, gray-green, quartz, very fine; abundant silt and sand; shell fragments	58	298
Clay, gray-green, heavy; abundant sand; shell fragments; interbedded sand and clay 300 to 302 feet; streak of mud at 326 feet; streak of marl at 356 feet; black sand	67	365
Sand, gray, quartz, very fine; clay; abundant shell fragments; black sand; possible water-bearing zone	29-2/3	394-2/3
Chert, black, very hard	1/3	395
Sand, gray, quartz, very fine; clay; shell fragments; streak of marl at 402 feet; sand coarser from 410 feet; appearance of gas bubbles at 350 feet ...	56	451

Well 2 (U.S.G.S. test hole 3); Central High School, 1 mile north-northeast of Painter, Accomack County

(Drilled by Sydnor Pump & Well Co., Inc.)

(Log by G. C. Tibbitts, Jr.; correlations by F. Stearns MacNeil)

Altitude 30 feet

	Thickness (feet)	Depth (feet)
Clay, gray, sandy; possibly fill from school excavation	7	7
Columbia group (Pleistocene):		
Soil, black, organic; possibly topsoil under fill.	2	9
Sand, iron-stained, quartz, fine to medium; black sand; organic material; scattered small gravels from 25 feet; streaks of dark-gray clay from 30 feet; shell fragments from 46 feet; water-bearing zone	51	60

Table 1.--Logs of wells on the Eastern Shore peninsula, Virginia--Continued

Well 2 (U.S.G.S. test hole 3); Central High School, 1 mile north-northeast of Painter, Accomack County--Continued

	Thickness (feet)	Depth (feet)
Columbia group (Pleistocene):--Continued		
Clay, gray-green, soft; abundant shell fragments; sandy	18	78
Clay, dark-gray, very hard	2/3	78-2/3
Sand, white to gray, quartz, medium; scattered shell fragments; black sand; water-bearing zone	11-1/3	90
Clay, dark-gray, heavy, sandy, silty; abundant shell fragments from 105 feet	27	117
Clay, dark-gray, heavy; interbedded with coarse quartz sand	5	122
Chesapeake group (Miocene):		
Yorktown formation:		
Clay, dark-gray, soft; abundant small gravels; black sand; gravel in lenses; possible water-bearing zone	3	125
Sand, gray, quartz, fine; abundant shell fragments; silt	5	130
Clay, dark-gray, soft; abundant shell fragments .	5	135
Shells, white, fragments; silt; clay, water-bearing zone	15	150
Sand, gray-green, quartz, very fine; abundant silt; shell fragments; gray clay	10	160
St. Marys formation:		
Sand, gray-green, quartz, very fine; abundant silt; shell fragment; gray clay; streak of mud at 164 feet; organic specks from 160 feet	22	182
Clay, dark-gray, hard	1	183
Sand, blue-gray, quartz, very fine; abundant clay; shell fragments	7	190
Shells, white, broken; 15 percent dark-gray clay; possible water-bearing zone	21	211
Sand, gray, quartz, very fine; abundant silt; clay; abundant black sand	14	225
Shells, white, broken; trace clay and silt; organic specks; possible water-bearing zone	21	246

Table 1.--Logs of wells on the Eastern Shore peninsula, Virginia--Continued

Well 2 (U.S.G.S. test hole 3); Central High School, 1 mile north-northeast of Painter, Accomack County--Continued

	Thickness (feet)	Depth (feet)
Chesapeake group (Miocene):--Continued		
St. Marys formation:--Continued		
Sand, gray-green, quartz, very fine; abundant shell fragments; abundant silt and clay; marl streaks at 246, 250, 260, 263, 266, and 270 feet	65	311
Choptank formation:		
Chert, black, very hard	1	312
Sand, gray, quartz; very abundant silt; shell fragments; clay; 18 inches hard marl at 328 feet; 4-inch streak shells at 349-2/3 feet	38	350
Clay, dark-gray, sticky; shell fragments	10	360
Sand, gray, quartz, very fine, silty, clay; scattered shell fragments	16	376
Clay, dark-gray, sticky; abundant silt; abundant sand; scattered shell fragments from 395 feet	74	450

Well 3 (U.S.G.S. test hole 2); Machipongo High School, at Machipongo, Northampton County

(Drilled by Sydnor Pump & Well Co., Inc.)

(Log by G. C. Tibbitts, Jr.; correlations by F. Stearns MacNeil)

Altitude 25 feet

	Thickness (feet)	Depth (feet)
Columbia group (Pleistocene):		
Topsoil, reddish; fine sand; clay; silt	6	6
Sand, white and iron-stained; quartz; fine to medium coarse; 1/16-inch diameter iron-stained gravels from 20 to 67 feet; accessory black chert fragments from 10 feet; appearance of glauconitic sand at 55 feet; very abundant gray silt from 60 to 67 feet; water-bearing zone	61	67
Clay, dark-gray, hard	½	67½
Sand, gray, fine, glauconitic; abundant silt	10½	78

Table 1.--Logs of wells on the Eastern Shore peninsula, Virginia--Continued

Well 3 (U.S.G.S. test hole 2); Machipongo High School, at Machipongo, Northampton County--Continued

	Thickness (feet)	Depth (feet)
Columbia group (Pleistocene):--Continued		
Marl, green, hard	1/3	78-1/3
Sand, light-gray, fine, glauconitic; abundant silt	4-2/3	83
Clay, dark-gray, soft, sandy; silt; scattered small gravels; shell fragments from 90 feet; harder drilling from 90 feet	17	100

Well 4, Sydnor test hole (100 feet from U.S.G.S. test hole 2); Machipongo High School, at Machipongo, Northampton County

(Drilled by Sydnor Pump & Well Co., Inc.)

(Log by G. C. Tibbitts, Jr.; correlations by F. Stearns MacNeil)

Altitude 25 feet

	Thickness (feet)	Depth (feet)
Columbia group (Pleistocene):		
Topsoil, reddish, fine, sandy	7	7
Sand, iron-stained, quartz, fine to coarse; streak of brown clay at 25 feet; streak of dark-gray clay at 56 feet, water-bearing zone	62	69
Clay, dark-gray; interbedded with coarse quartz sand streaks; black organic specks	11	80
Chesapeake group (Miocene):		
Yorktown formation:		
Clay, dark-gray, solid; scattered shell fragments from 90 feet	50	130
Clay, gray, solid; interbedded coarse sand and shells	10	140
Shells, white, broken; traces of clay and fine sand; water-bearing zone	27	167
Clay, dark-gray, solid, silty, sandy; shell fragments	13	180

Table 1.--Logs of wells on the Eastern Shore peninsula, Virginia--Continued

Well 4, Sydnor test hole (100 feet from U.S.G.S. test hole 2); Machipongo High School, at Machipongo, Northampton County--Continued

	Thickness (feet)	Depth (feet)
Yorktown(?) formation:		
Clay, dark-gray, solid, silty, sandy; shell fragments; trace of hard chert gravels at 190 feet	20	200
Sand, gray, very fine, clayey; streaks of shell fragments	10	210

Well 5 (U.S.G.S. test hole 1); Capeville Elementary School, at Capeville, Northampton County

(Drilled by Sydnor Pump & Well Co., Inc.)

(Log by G. C. Tibbitts, Jr.; correlations by F. Stearns MacNeil)

Altitude 20 feet

	Thickness (feet)	Depth (feet)
Columbia group (Pleistocene):		
Topsoil, reddish; traces of fine sand; silt; abundant clay	7	7
Sand, iron-stained, brown to white, coarse to medium, quartz; black sand from 35 to 53 feet; 18-inch to ¼-inch iron-stained quartz gravels throughout; water-bearing zone	46	53
Chesapeake group (Miocene):		
Yorktown formation:		
Clay, medium-gray, sticky, silty; scattered shell fragments; rough limestone chips	9	62
Clay and shells, gray and white, silty; abundant mica; quartz pebbles from 70 to 90 feet; shark teeth .	28	90
Shells, white, fragments; traces of clay and silt; hard chert chips from 110 to 130 feet; varicolored quartz pebbles from 115 to 125 feet; clear quartz pebbles from 125 to 130 feet; greenstone pebbles up to 1/8-inch in diameter, from 125 to 130 feet; water-bearing zone	40	130

Table 1.--Logs of wells on the Eastern Shore peninsula, Virginia--Continued

Well 5 (U.S.G.S. test hole 1); Capeville Elementary School, at Capeville, Northampton County--Continued

	Thickness (feet)	Depth (feet)
Chesapeake group (Miocene):--Continued		
Yorktown formation:--Continued		
Clay, gray-green, soft; very abundant shell fragments, interbedded (shells possibly 50%); sandy, hard clay bed from 137 to 138 feet; silty; iron-stained quartz pebbles at 145 feet	30	160
Silt, gray-green, clayey; scattered shell fragments	10	170
Shells, white, broken; trace of clay and silt; quartz sand at 180 feet; water-bearing zone	35	205
Clay, gray-green, soft; very abundant shell fragments	10	215
Sand, gray, quartz, very silty; scattered shell fragments; scattered quartz pebbles; black sand; clay	25	240
Clay, dark-gray, heavy glauconitic; scattered quartz pebbles	7	247
Sand, black, fine; abundant shell fragments; clay; scattered quartz pebbles; possible water-bearing zone	45	292
Clay, gray-green, heavy; scattered shells; black sand; sand lens from 306-308 feet; 6-inch marl streak at 310 feet	18	310
St. Marys formation:		
Sand, gray, quartz, fine; abundant clay; abundant shell fragments; marl streaks at 311 and 314 feet ...	15	325
Sand, dirty white, quartz, very fine, glauconitic; trace of clay; abundant shell fragments; possible water-bearing zone	25	350
Clay, gray-green, soft, very sandy; scattered shell fragments; wood chips; streak of marl at 376 feet; beds of very hard marl from 405-408 feet	75	425
Choptank formation:		
Clay, gray-green, soft, very sandy; scattered shell fragments; wood chips; very hard marl from 435-439 feet	15	440
Chert, black, very hard	2	442

Table 1.--Logs of wells on the Eastern Shore peninsula, Virginia--Continued

Well 5 (U.S.G.S. test hole 1); Capeville Elementary School, at Capeville, Northampton County--Continued

	Thickness (feet)	Depth (feet)
Chesapeake group (Miocene):--Continued		
Choptank formation:--Continued		
Sand, iron-stained, quartz, coarse; trace of clay; scattered shell fragments; possible water-bearing zone	22	464
Clay, dark-gray, heavy, silty; scattered shell fragments	6	470