DELAWARE GEOLOGICAL SURVEY
UNIVERSITY OF DELAWARE, NEWARK
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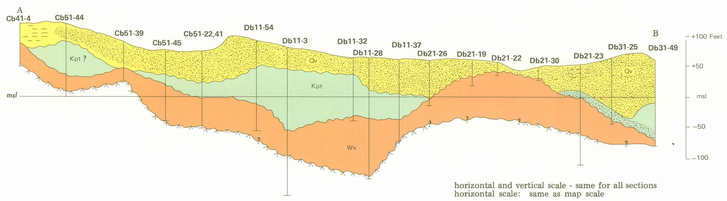
DELAWARE GEOLOGICAL SURVEY

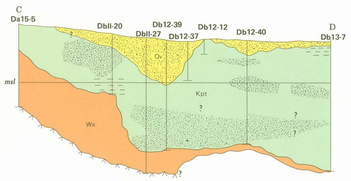
GEOHYDROLOGY OF THE NEWARK AREA
NEWARK EAST, NEWARK WEST QUADRANGLES
HYDROLOGIC MAP SERIES, NO. 2
SHEET 1—BASIC GEOLOGY

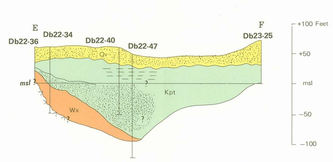
INTERPRETIVE CROSS-SECTIONS

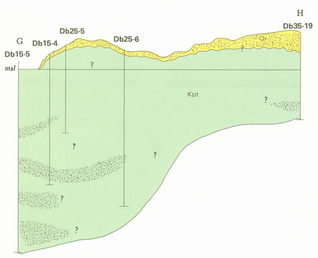
Qv	Columbia Formation and Holocene Sediments	QUATERNARY	
Kpt	Potomac Formation	CRETACEOUS	aquifers or sandy zones
Wx	weathered crystalline basement	CAMBRO-ORDOVICIAN ?	silt
	unweathered crystalline basement		clay

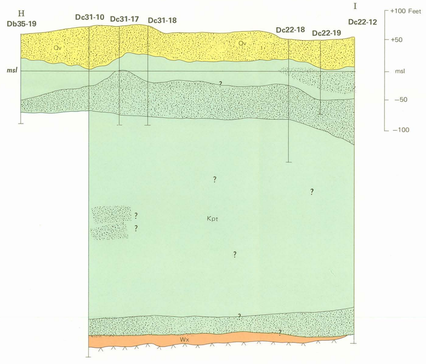


horizontal and vertical scale - same for all sections
horizontal scale: same as map scale

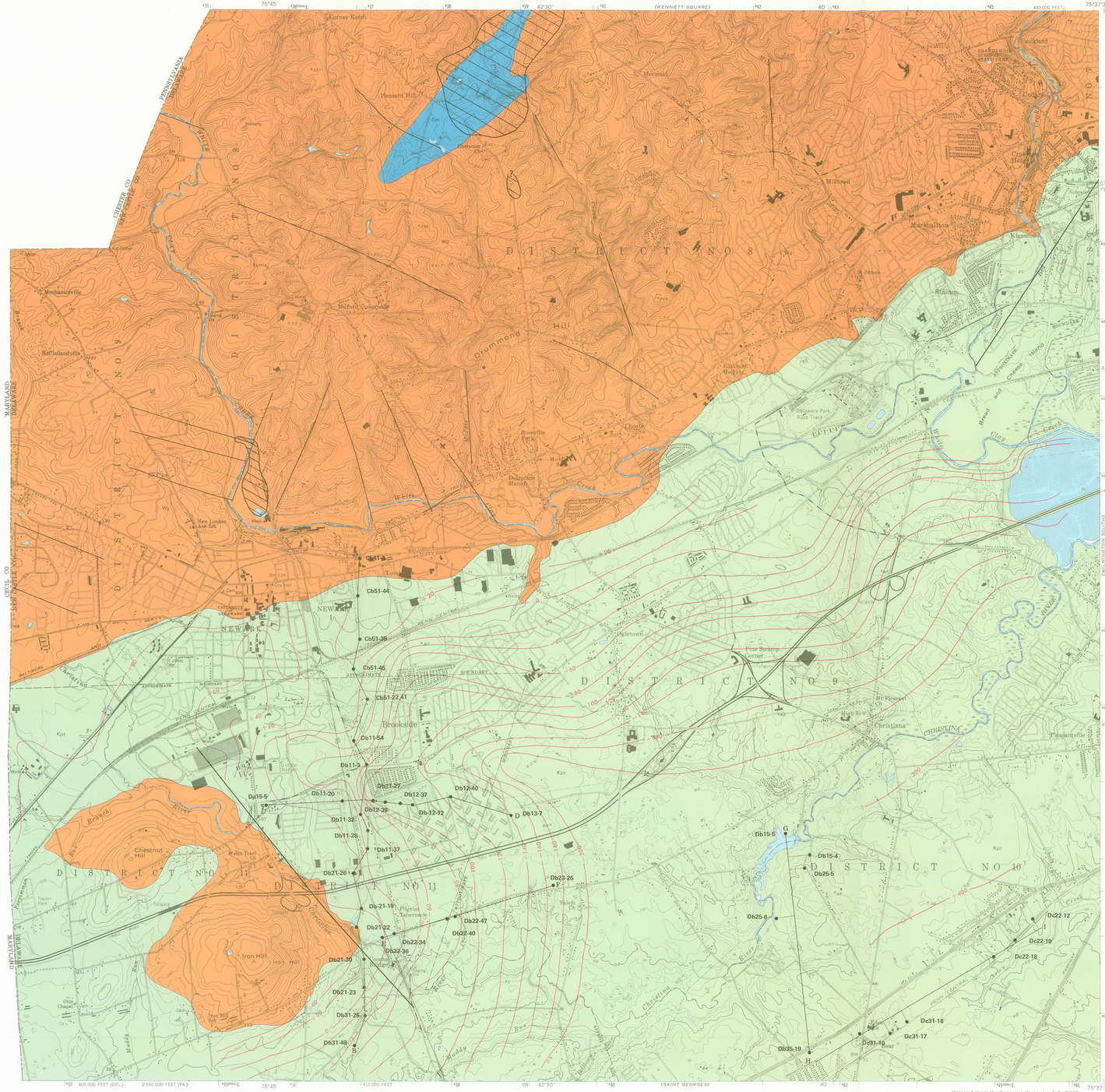








Base maps - USGS Topographic Division, Newark East, Newark West Quadrangles.



Williams & Heinz Map Corporation, Washington, D.C. 20027

EXPLANATION

Kpt

Sediments of the Coastal Plain Province: unconsolidated sediments of Early and Late Cretaceous age (Potomac Formation) unconformably overlain in most places by sediments of Pleistocene (Columbia Formation) and/or Holocene (Recent) age. The Potomac Formation is fluvial, probably deltaic in origin and is composed predominately of clays and silts with some interbedded sands. In the northern part of the Coastal Plain, the sands are generally thin and irregular in extent and thickness. Correlation of individual sands from place to place is usually difficult and often impossible. Many sands are fine-grained and may contain clay or silt which makes well development difficult. Yields are highly variable ranging from as low as a few gallons per minute to as high as 500 gallons per minute. The results of short-term pumping tests should be interpreted with caution because of the extreme lateral and vertical variations in sediment type. Toward the southeastern part of the map area, the total sediment column above basement rock thickens and chances are greater for the occurrence of sands within the Potomac Formation (see cross-section H-I). The best aquifers seem to occur close to crystalline basement (Sundstrom and others, 1967).

The Columbia Formation is composed primarily of poorly sorted fluvial sands with some interbedded gravels, silts, and clays. Thicker sections of the Columbia Formation (paleochannels) often provide large amounts of ground water, up to several hundred gallons per minute, where sufficient saturated thickness is present. The thickness of the Columbia Formation in the Newark area has been mapped by Woodruff and Thompson (1972). The Columbia serves as a recharge source in many areas for the underlying Potomac Formation.

Wg / g Cm

Crystalline rocks of the Piedmont Province: predominantly gneisses and schists of the Wissahickon Formation (Wg) with some layered amphibolites. The valley just to the south of Pleasant Hill in the northern part of the map area is underlain by marble of the Cockeysville Formation (Cm). This lithology is generally reflected by a greater than normal thickness of weathered material. Iron and Chestnut Hills are underlain by gabbro (g) of the Wilmington Complex (Woodruff and Thompson, 1972) and are entirely surrounded by Coastal Plain sediments. Ground-water yields from Piedmont rocks are highly variable and may range from no yield to as much as 400 to 500 gallons per minute on initial pump tests. Fractured marble usually produces the highest yields while rocks of the Wilmington Complex seem to be consistently low in ground-water yields (a few gallons per minute on the average). Studies of fracture traces in relation to topography have proven useful in locating wells with higher than average yields. Pump tests on new Piedmont wells must be interpreted with caution as initial yields may decline with time by as much as 50%.

120

Altitude in feet of weathered basement beneath Coastal Plain sediments (sea level datum). The top of weathered basement usually defines the maximum depth of drilling for ground-water exploration in the Coastal Plain. Locally, little ground-water has been found in the basement (crystalline) rocks beneath the Coastal Plain sediments.

minor major

Fracture traces or lineaments postulated from study of conventional air photos, topographic maps, and satellite photos. Such traces often indicate zones of fractured rock where ground-water yields may be higher than average.

● Db11-28

Well or test hole number

A — B

Location of cross-section

Areas in the Piedmont where depth of weathering or overburden on crystalline rocks exceeds 80 feet. Well construction practices require that well casing be installed through the overburden in most instances.

For detailed geology of the map area see Woodruff and Thompson (1972).

SELECTED REFERENCES

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GEOHYDROLOGY OF THE NEWARK AREA, DELAWARE

by

Kenneth D. Woodruff

1977

UTM GRID AND 1970 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

CONTOUR INTERVAL 10 AND 20 FEET (APPROX. 3 METERS AND 6 METERS)

QUADRANGLE LOCATION