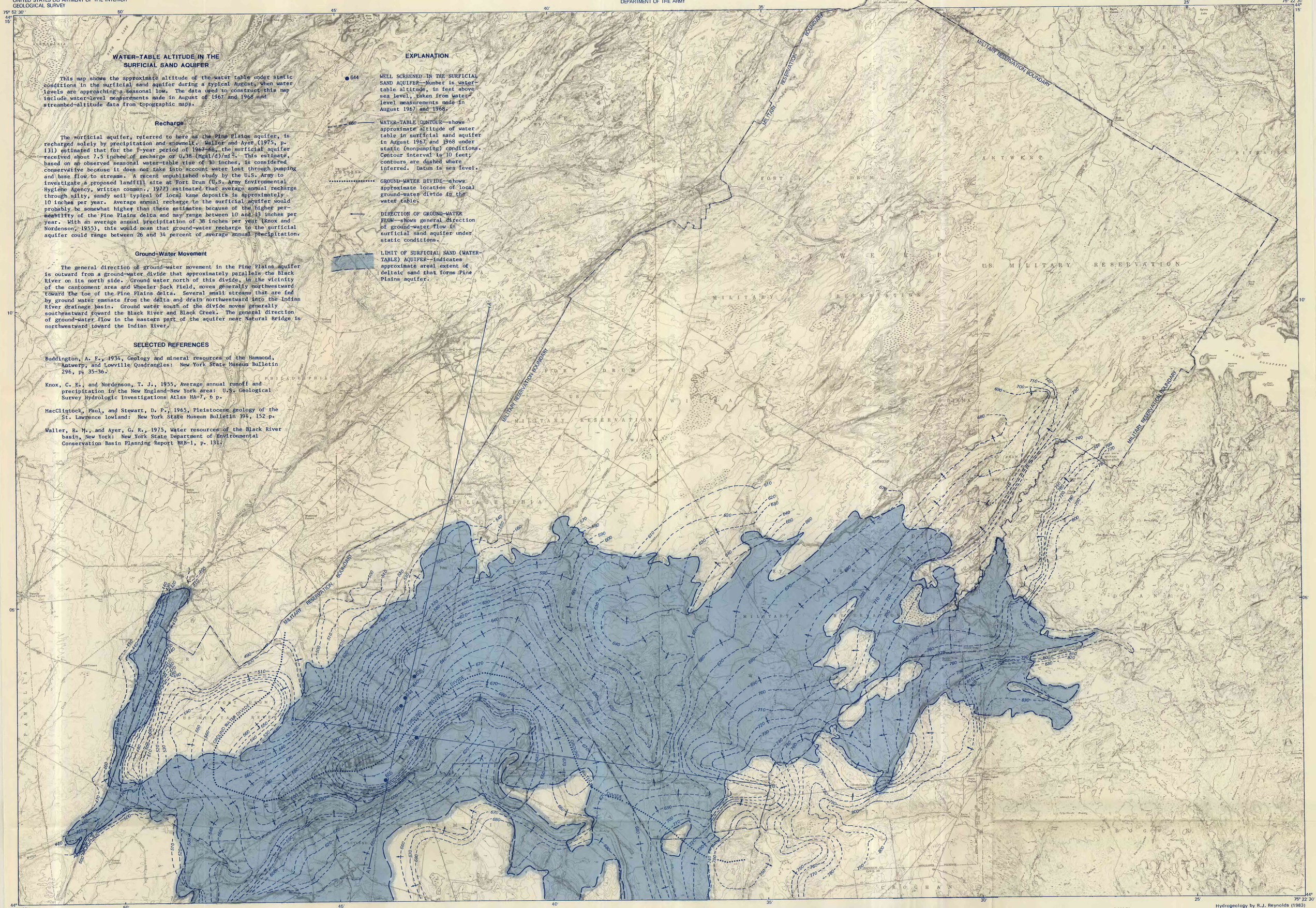

WATER-TABLE ALTITUDE IN THE SURFICIAL SAND AQUIFER

This map shows the approximate altitude of the water table under static conditions in the surficial sand aquifer during a typical August, when water levels are approaching a seasonal low. The data used to construct this map include water-level measurements made in August of 1967 and 1968 and streambed-altitude data from topographic maps.

Recharge

The surficial aquifer, referred to here as the Pine Plains aquifer, is recharged solely by precipitation and snowmelt. Waller and Ayer (1975, p. 131) estimated that for the 1-year period of 1967-68, the surficial aquifer received about 7.5 inches of recharge or 0.38 (Mgal/d)/mi². This estimate, based on an observed seasonal water-table rise of 30 inches, is considered conservative because it does not take into account water lost through pumping and base flow to streams. A recent unpublished study by the U.S. Army to investigate a proposed landfill site at Fort Drum (U.S. Army Environmental Hygiene Agency, written commun., 1977) estimated that average annual recharge through silty, sandy soil typical of local kame deposits is approximately 10 inches per year. Average annual recharge to the surficial aquifer would probably be somewhat higher than these estimates because of the higher permeability of the Pine Plains delta and may range between 10 and 13 inches per year. With an average annual precipitation of 38 inches per year (Knox and Nordenson, 1955), this would mean that ground-water recharge to the surficial aquifer could range between 26 and 34 percent of average annual precipitation.

Ground-Water Movement

The general direction of ground-water movement in the Pine Plains aquifer is outward from a ground-water divide that approximately parallels the Black River on its north side. Ground water north of this divide, in the vicinity of the cantonment area and Wheeler Sack Field, moves generally northwestward toward the toe of the Pine Plains delta. Several small streams that are fed by ground water emanate from the delta and drain northwestward into the Indian River drainage basin. Ground water south of the divide moves generally southeastward toward the Black River and Black Creek. The general direction of ground-water flow in the eastern part of the aquifer near Natural Bridge is northwestward toward the Indian River.

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MacClintock, Paul, and Stewart, D. P., 1965, Pleistocene geology of the St. Lawrence lowland: New York State Museum Bulletin 394, 152 p.

Waller, R. M., and Ayer, G. R., 1975, Water resources of the Black River basin, New York: New York State Department of Environmental Conservation Basin Planning Report BRB-1, p. 131.

EXPLANATION

644 — WELL SCREENED IN THE SURFICIAL SAND AQUIFER--Number is water-table altitude, in feet above sea level, taken from water-level measurements made in August 1967 and 1968.

650 — WATER-TABLE CONTOUR--shows approximate altitude of water table in surficial sand aquifer in August 1967 and 1968 under static (nonpumping) conditions. Contour interval is 10 feet; contours are dashed where inferred. Datum is sea level.

GROUND-WATER DIVIDE--shows approximate location of local ground-water divide in the water table.

DIRECTION OF GROUND-WATER FLOW--shows general direction of ground-water flow in surficial sand aquifer under static conditions.

LIMIT OF SURFICIAL SAND (WATER-TABLE) AQUIFER--indicates approximate areal extent of deltaic sand that forms Pine Plains aquifer.

Base from New York State Department of Transportation
Black River(1980), Deferiet(1980), Antwerp(1980), North Wilna(1980),
Natural Bridge(1969), Lake Bonaparte(1968), Natural Dam(1968), 1:24,000 quadrangles

0 ½ 1 2 MILES
0 ½ 1 2 KILOMETERS

Hydrogeology by R.J. Reynolds (1983)

HYDROGEOLOGY OF THE FORT DRUM AREA, JEFFERSON, LEWIS, AND ST. LAWRENCE COUNTIES, NEW YORK

By
Richard J. Reynolds

ALTITUDE OF THE WATER TABLE IN THE SURFICIAL SAND AQUIFER