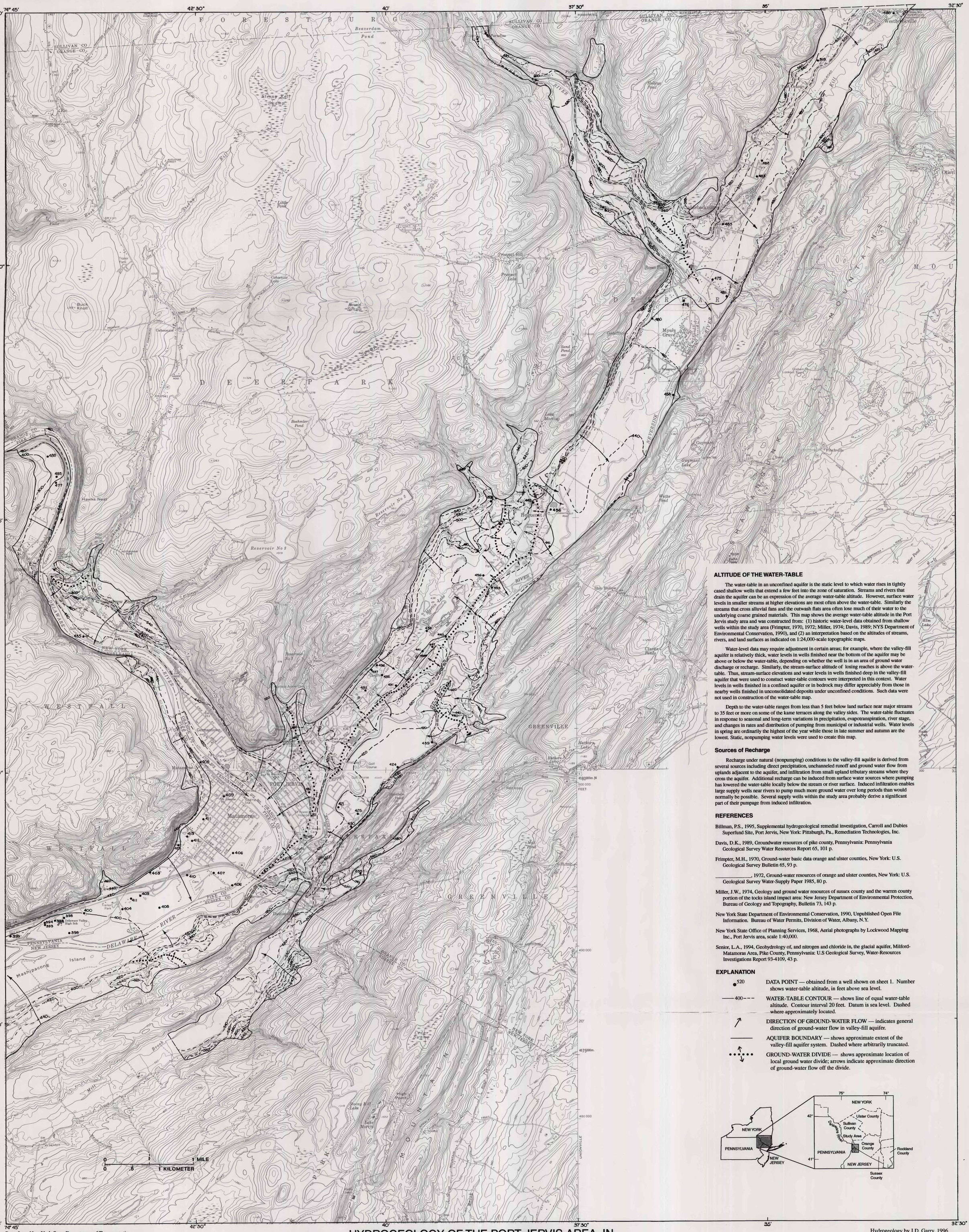

ALTITUDE OF THE WATER-TABLE

The water-table in an unconfined aquifer is the static level to which water rises in tightly cased shallow wells that extend a few feet into the zone of saturation. Streams and rivers that drain the aquifer can be an expression of the average water-table altitude. However, surface water levels in smaller streams at higher elevations are most often above the water-table. Similarly the streams that cross alluvial fans and the outwash flats area often lose much of their water to the underlying coarse grained materials. This map shows the average water-table altitude in the Port Jervis study area and was constructed from: (1) historic water-level data obtained from shallow wells within the study area (Frimpter, 1970, 1972; Miller, 1974; Davis, 1989; NYS Department of Environmental Conservation, 1990), and (2) an interpretation based on the altitudes of streams, rivers, and land surfaces as indicated on 1:24,000-scale topographic maps.

Water-level data may require adjustment in certain areas; for example, where the valley-fill aquifer is relatively thick, water levels in wells finished near the bottom of the aquifer may be above or below the water-table, depending on whether the well is in an area of ground water discharge or recharge. Similarly, the stream-surface altitude of losing reaches is above the water-table. Thus, stream-surface elevations and water levels in wells finished deep in the valley-fill aquifer that were used to constuct water-table contours were interpreted in this context. Water levels in wells finished in a confined aquifer or in bedrock may differ appreciably from those in nearby wells finished in unconsolidated deposits under unconfined conditions. Such data were not used in construction of the water-table map.

Depth to the water-table ranges from less than 5 feet below land surface near major streams to 35 feet or more on some of the kame terraces along the valley sides. The water-table fluctuates in response to seasonal and long-term variations in precipitation, evapotranspiration, river stage, and changes in rates and distribution of pumping from municipal or industrial wells. Water levels in spring are ordinarily the highest of the year while those in late summer and autumn are the lowest. Static, nonpumping water levels were used to create this map.

Sources of Recharge

Recharge under natural (nonpumping) conditions to the valley-fill aquifer is derived from several sources including direct precipitation, unchanneled runoff and ground water flow from uplands adjacent to the aquifer, and infiltration from small upland tributary streams where they cross the aquifer. Additional recharge can be induced from surface water sources where pumping has lowered the water-table locally below the stream or river surface. Induced infiltration enables large supply wells near rivers to pump much more ground water over long periods than would normally be possible. Several supply wells within the study area probably derive a significant part of their pumpage from induced infiltration.

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EXPLANATION

- ●520 — DATA POINT — obtained from a well shown on sheet 1. Number shows water-table altitude, in feet above sea level.
- —— 400 - - - — WATER-TABLE CONTOUR — shows line of equal water-table altitude. Contour interval 20 feet. Datum is sea level. Dashed where approximately located.
- ↗ — DIRECTION OF GROUND-WATER FLOW — indicates general direction of ground-water flow in valley-fill aquifer.
- ——— — AQUIFER BOUNDARY — shows approximate extent of the valley-fill aquifer system. Dashed where arbitrarily truncated.
- • • • • • • — GROUND-WATER DIVIDE — shows approximate location of local ground water divide; arrows indicate approximate direction of ground-water flow off the divide.

Base from New York State Department of Transportation
Port Jervis South, 1985, Port Jervis North, 1985, Otisville, 1985, NY, 1:24,000

Hydrogeology by J.D. Garry, 1996

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1999