DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
NEW YORK STATE DEPARTMENT OF HEALTH

OPEN-FILE REPORT 82-552
(SHEET 4 OF 5)

# GENERALIZED POTENTIOMETRIC SURFACE

By

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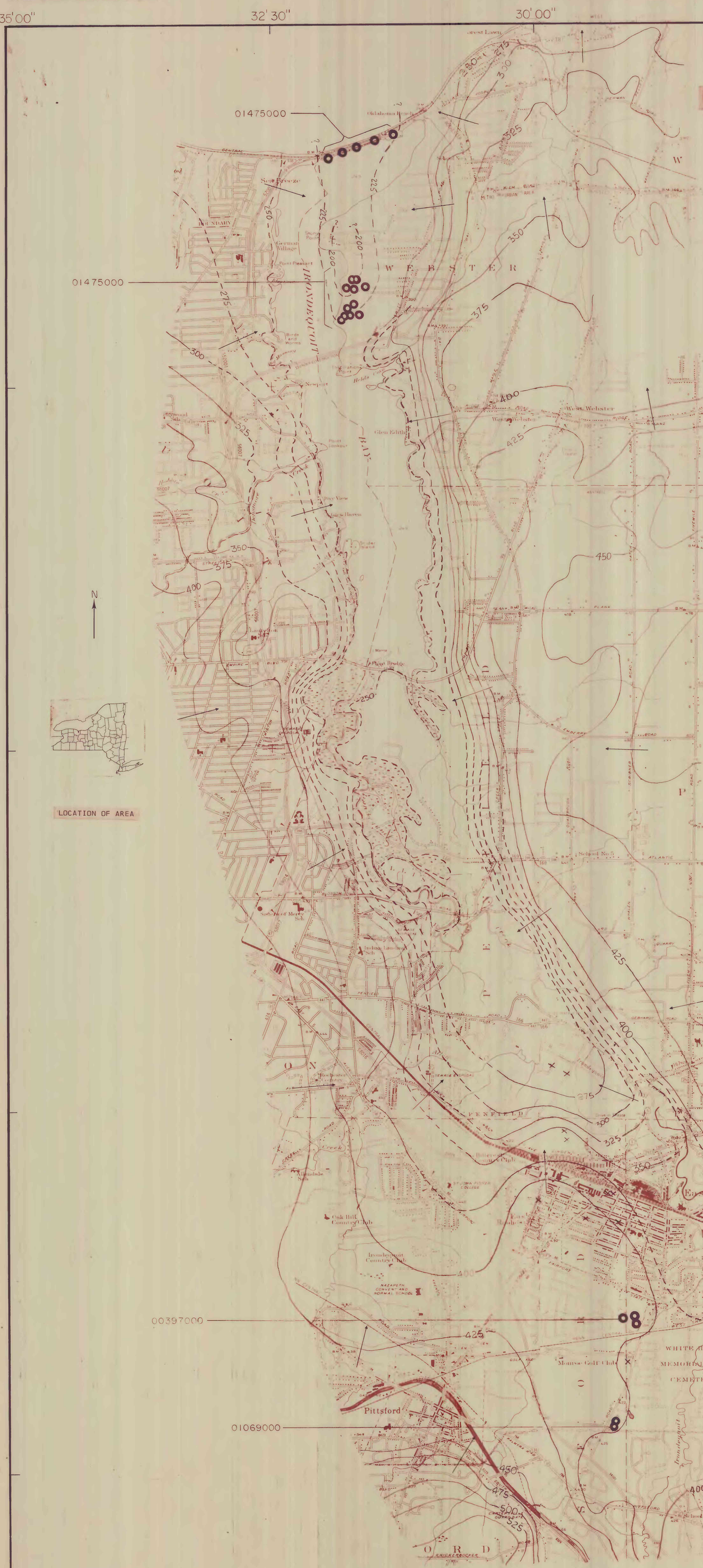


## EXPLANATION

900--- POTENTIOMETRIC CONTOUR—shows approximate altitude at which water would stand in tightly cased wells. Dashed where control is poor. Contour interval 25 feet. Arrow indicates direction of ground-water flow

### WELL SYMBOLS

00397000 COMMUNITY WATER SYSTEM WELL OR WELL FIELD—numbered by New York State Department of Health. May apply to one or more systems owned by the community

X DATA POINT—well or test hole used to draw contours

### NOTE

The contours represent the generalized altitude of the potentiometric surface in the aquifer(s) based on water levels in many wells measured during 1935 and also on subsequent well-construction data. The solid contours in much of the area are based on data presented by Young (1980). The dashed contours are estimates by the authors. Contours around the community water systems are based on static levels reported in 1973. Pumping levels (not shown) in all the well fields create cones of influence—in the Webster well field (east of Irondequoit Bay) as much as 70 feet of drawdown occurs (Morrison, 1974). Under non-pumping conditions in the "northern" aquifer system (see sections, sheet 2) water levels in both the shallow and deep systems are about at equilibrium with the bay and Lake Ontario levels.

### GROUND-WATER MOVEMENT

The water-level contours show that ground water is moving generally towards the bay. The bedrock valley, with its permeable deposits, acts as a drain. Under natural conditions the ground water probably moves upward into the bay through bottom deposits (see sections C-C', C"-C", sheet 2). Additional discharge occurs northward through lake subcrops of the more permeable zones. Morrison (1974) concludes that under pumping conditions in the Webster sand-bar field lower aquifer, at the mouth of Irondequoit Bay, water-table gradients are reversed and ground water moves to the well field southward from Lake Ontario. Morrison (1974) also shows that the water level in the upper aquifer is not affected by pumping in the lower aquifer.

### WELL YIELDS

The community water systems noted on the map have wells that are capable of yielding several hundred gallons per minute, even with several wells pumping. The detailed studies of Webster's well fields (Larsen, 1973 and Morrison, 1974, 1975) resulted in estimates of aquifer yields ranging from 1 to 10 million gallons per day at the Sand Bar field and 13 million gallons per day at the DeWitt field.

Water in the lower aquifer in the northern part of the buried valley is under confined conditions. Hence, pumping effects are noticeable between the two well fields—which are about 6500 feet apart. The confined conditions, along with the relatively narrow (E-W) dimensions of the aquifer, can cause excessive well interference and drawdowns in closely spaced wells.

### RECHARGE AREAS

Most recharge to the aquifer system probably occurs in the southern portions where very permeable geologic materials occurs (see Sheet 1). Recharge also occurs from the east and west adjacent to Irondequoit Bay and Creek. Chloride contamination from near-surface disposals, (Korol, M. A., and Burton, R. S., Monroe County Health Department, written communication, 1971) in East Rochester and Pittsford well fields indicate that water can readily infiltrate to the aquifer as water-table conditions exist in that area.

Induced recharge from Lake Ontario (Morrison, 1974 and 1975) and, very likely, Irondequoit bay and adjacent bedrock units occurs near heavy-pumping centers.

### REFERENCES CITED

Larsen, W. C., 1973, Goals and options concerning the village [Webster] water supply system: William C. Larsen, P. E., Rochester, New York, mimeograph report December, 29 p., 20 app.

Morrison, W. D., 1974, Hydrogeologic investigation for the Village of Webster: Hydrology Consultants Ltd., Mississauga Ontario, October mimeograph report, File No. 8321, 16 p.

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Young, R. A., 1980, Explanation to accompany sub-surface bedrock contour maps, generalized ground-water contour maps, and overburden thickness maps, Monroe County, New York: Monroe County Environmental Management Council, Rochester, 8 p., 3 maps.

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HYDROLOGY FROM YOUNG (1980); MODIFIED
BY T.J. HOLECEK AND R.M.WALLER, 1982

# GEOHYDROLOGY OF THE PREGLACIAL GENESEE VALLEY, MONROE COUNTY, NEW YORK

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