DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER-RESOURCES INVESTIGATIONS REPORT 87-4183
SHEET 1--SURFICIAL GEOLOGY

INTRODUCTION

Upstate New York contains both unconsolidated aquifers and bedrock aquifers. The unconsolidated aquifers are primarily sand and(or) gravel of glacial origin. Bedrock aquifers, although significant in some areas, are not addressed here. During the 1950's and 1960's, the U.S. Geological Survey, in cooperation with the New York State Department of Environmental Conservation, prepared reports on the ground-water resources of many counties and river basins in New York that are inconsistent in scale, format, and amount of detail. Other statewide maps, one of which depicts aquifers at 1:1,000,000 scale (Heath, 1965) and the other at 1:750,000 scale (Kantrowitz and Snavely, 1982), have insufficient detail for development of most local and many regional aquifer-protection plans. This three-map set is one in a series of five that together depict ground-water availability in the 15 major river basins in upstate New York at scales 1:125,000 or 1:250,000.

This set of maps describes the unconsolidated aquifers in the central Lake Ontario basin within New York. The 708-square-mile basin includes parts of Monroe, Wayne, Cayuga, Ontario, and Oswego Counties. The basin extends from Rochester in the west to Oswego in the east. These maps delineate the distribution of unconsolidated deposits and aquifers (sheet 1), the locations of wells from which data are stored in the U.S. Geological Survey files (sheet 2), and the potential well yield from unconsolidated aquifers (sheet 3). These maps are at scale 1:125,000 and based on the most recent information available.

These maps provide a regional view of the extent of the unconsolidated aquifer systems; they are not intended for detailed site evaluations. Additional sources of information for use in site evaluation are given in the references listed to the right, but to determine the precise location of aquifer boundaries or actual well yields would require site-specific information.

Ground water may be obtained from areas other than those indicated on these maps, such as from unconsolidated aquifers too small to be shown at this scale, or from till, buried unconsolidated aquifers not yet identified, and underlying bedrock. Adequate amounts of water for domestic use (0.5 to 5 gallons per minute) can be obtained from all of these sources. Some areas contain important bedrock aquifers that warrant consideration in the appraisal of ground-water conditions.

Method

The surficial geologic map was compiled from published maps (Miller, 1980, 1981), Muller and Cadwell (1986), and Yager and others (1985) and from interpretation of topographic maps.

Aquifer boundaries were derived from (1) hydrogeologic and surficial-geology maps that are listed in references to the right, (2) well logs on file at the U.S. Geological Survey, and (3) interpretation of topographic maps. Well yields represent the potential range of yields obtainable from properly constructed individual wells screened and developed in the aquifer. Yields may not represent sustained withdrawals from the deposit but, rather, the potential short-term withdrawal. The indicated yields in many areas are based on numerous aquifer- and well-capacity-test data and on reported yields from drillers and homeowners; estimates in other areas are based on geologic logs, saturated thickness, and relations between grain size and hydraulic conductivity. Actual yields may differ from those indicated. Areas that are labeled with a letter but indicate no range of well yield lack sufficient data on wells or hydraulic properties for a yield estimate. Areas that contain a letter symbol consist of coarse-grained material according to the surficial geologic map of New York (Muller and Cadwell, 1986) and, consequently, are potentially significant aquifers.

REFERENCES

Griswold, R. E., 1951, The ground-water resources of Wayne County, New York: New York State Water Power and Control Commission Bulletin GW-29, 61 p.

Heath, R. C., 1964, Ground water in New York: New York State Water Resources Commission Bulletin GW-51, 1 sheet, scale 1:1,000,000.

Kantrowitz, I. H., and Snavely, D. S., 1982, Availability of ground water from aquifers in upstate New York: U.S. Geological Survey Open-File Report 82-437, 2 sheets, scale 1:750,000.

Leggette, R. M., Gould, L. O., and Dollen, B. H., 1935, Ground-water resources of Monroe County, New York: Rochester, N.Y., Monroe County Regional Planning Board Report, 186 p.

Miller, T. S., 1980, Surficial geology of Oswego West quadrangle, Oswego County, New York: U.S. Geological Survey Water-Resources Investigations Open-File Report 80-968, 1 sheet, scale 1:24,000.

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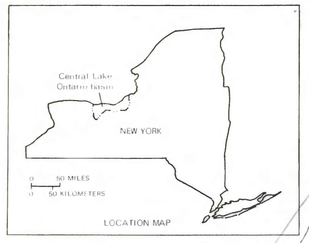

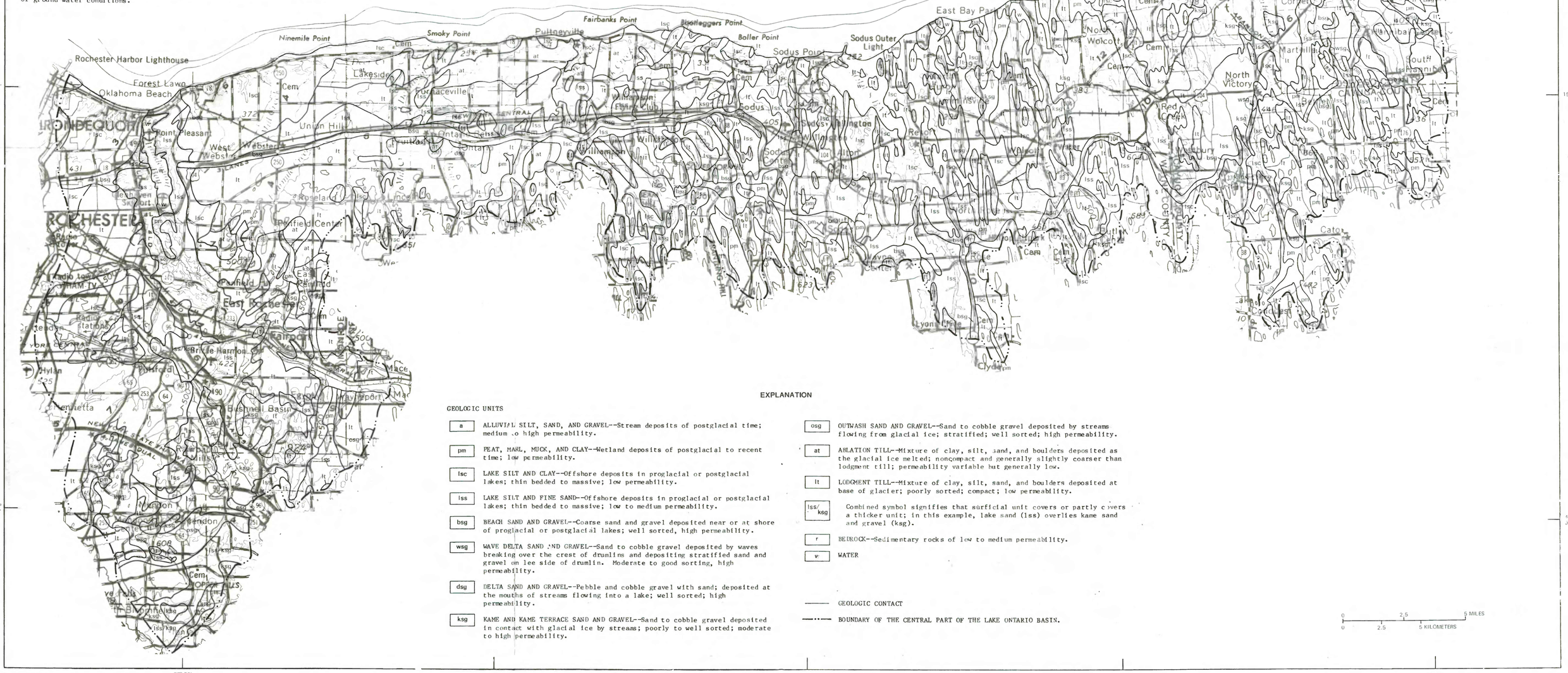

EXPLANATION

GEOLOGIC UNITS

a	ALLUVIAL SILT, SAND, AND GRAVEL--Stream deposits of postglacial time; medium to high permeability.
pm	PEAT, MARL, MUCK, AND CLAY--Wetland deposits of postglacial to recent time; low permeability.
lsc	LAKE SILT AND CLAY--Offshore deposits in proglacial or postglacial lakes; thin bedded to massive; low permeability.
lss	LAKE SILT AND FINE SAND--Offshore deposits in proglacial or postglacial lakes; thin bedded to massive; low to medium permeability.
bsg	BEACH SAND AND GRAVEL--Coarse sand and gravel deposited near or at shore of proglacial or postglacial lakes; well sorted, high permeability.
wsg	WAVE DELTA SAND AND GRAVEL--Sand to cobble gravel deposited by waves breaking over the crest of drumlins and depositing stratified sand and gravel on lee side of drumlin. Moderate to good sorting, high permeability.
dsg	DELTA SAND AND GRAVEL--Pebble and cobble gravel with sand; deposited at the mouths of streams flowing into a lake; well sorted; high permeability.
ksg	KAME AND KAME TERRACE SAND AND GRAVEL--Sand to cobble gravel deposited in contact with glacial ice by streams; poorly to well sorted; moderate to high permeability.
osg	OUTWASH SAND AND GRAVEL--Sand to cobble gravel deposited by streams flowing from glacial ice; stratified; well sorted; high permeability.
at	ABLATION TILL--Mixture of clay, silt, sand, and boulders deposited as the glacial ice melted; noncompact and generally slightly coarser than lodgment till; permeability variable but generally low.
lt	LODGMENT TILL--Mixture of clay, silt, sand, and boulders deposited at base of glacier; poorly sorted; compact; low permeability.
lss/ ksg	Combined symbol signifies that surficial unit covers or partly covers a thicker unit; in this example, lake sand (lss) overlies kame sand and gravel (ksg).
r	BEDROCK--Sedimentary rocks of low to medium permeability.
w	WATER

——— GEOLOGIC CONTACT

—·—·— BOUNDARY OF THE CENTRAL PART OF THE LAKE ONTARIO BASIN.

0 2.5 5 MILES
0 2.5 5 KILOMETERS

Base from U.S. Geological Survey
Elmira, NY PA, 1968 and Rochester, NY:US:Canada, 1961, 1:250,000 scale

Geology from Miller, 1980, a and b, Yager, etal, 1985, and Muller and Cadwell, 1986

GROUND-WATER AVAILABILITY IN THE CENTRAL PART OF LAKE ONTARIO BASIN, NEW YORK

By
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Sheet 1. Surficial Geology