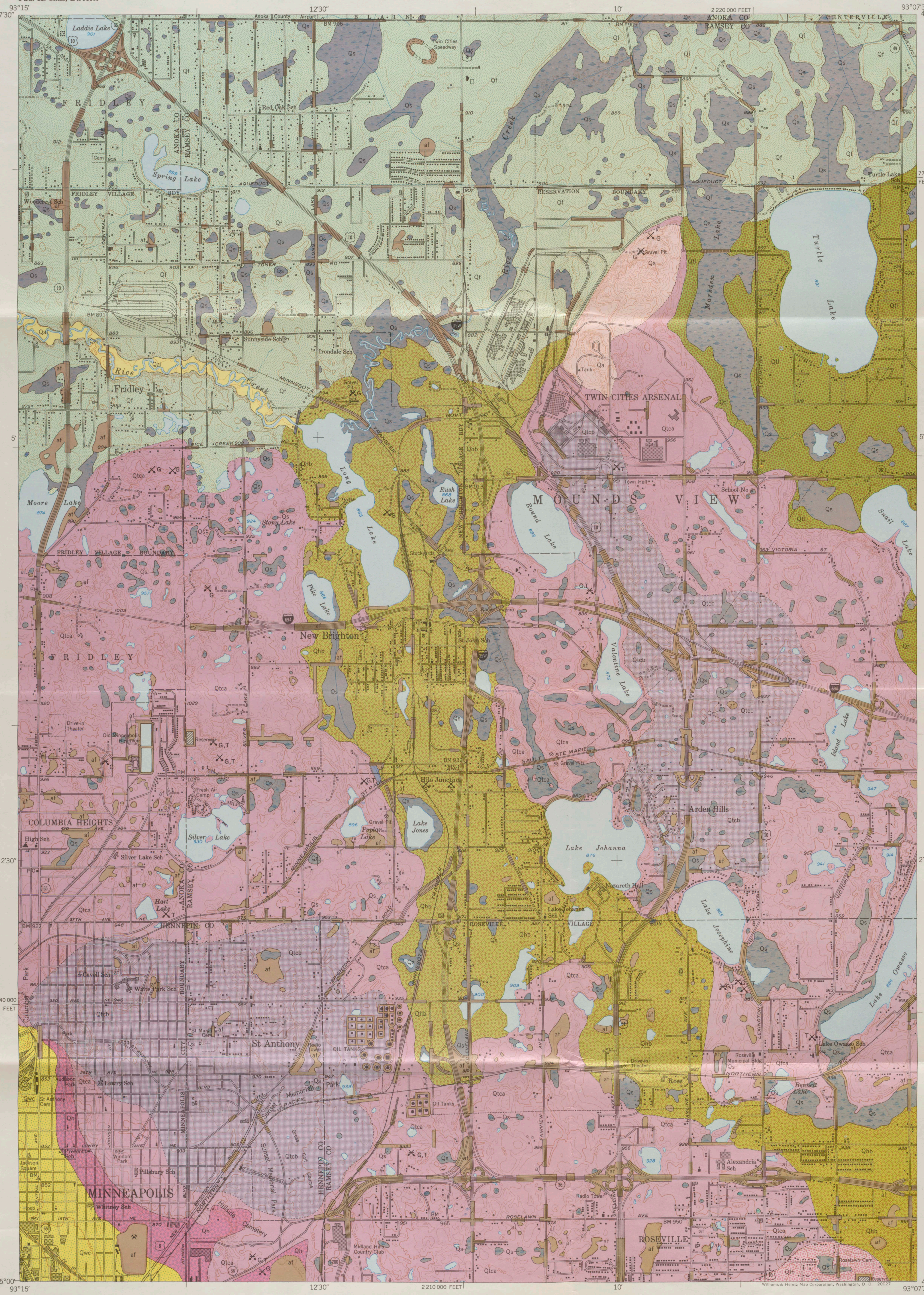
GEOLOGICAL SURVEY
Paul K. Sims, Director

STATE OF MINNESOTA
UNIVERSITY OF MINNESOTA

GEOLOGIC MAP SERIES, GM 2
Plate 1



EXPLANATION

af
Artificial Fill
Varies from construction rubble to natural material brought in from afar to natural material from the immediately surrounding area.

Qal
Alluvium
Fine to medium sand and silt. Deposited on recent flood plains.

Qs
Swamp and Marsh Deposits
Organic fine sand, silt, and clay; peat and muck.

Qwc
West Campus Sand
Fine to coarse sand with lenses of gravel, silt, and clay; generally cross-bedded. Alluvium deposited by the Mississippi River when flood plain was at a higher level than at present.

Qf
Fridley Formation
Laminated and cross-laminated fine to medium sand with some silt grading laterally and vertically into large bodies of silt. Most individual laminae are well sorted (poorly assorted). Mostly deposited in a lake. The upper five to fifteen feet have been substantially modified by wind action and soil-forming processes. Unit includes sand dunes at surface.

Qnb
New Brighton Formation
Laminated and cross-laminated fine to mediun sand, silt, and coarse sand with pebbles. Variable both vertically and horizontally. Mostly deposited in a lake. Upper part modified by wind action and soil formation.

Qa
Arsenal Sand
Medium to coarse very gravelly sand; intricately cross-bedded. Kame deposited in reentrant in the ice by melt-water running off the ice.

Qtl
Turtle Lake Sand
Laminated and cross-bedded fine to medium sand with some silt. Medium to coarse sand and gravel along western edge. Deposited in a lake.

Qfh
Falcon Heights Sand
Medium to coarse gravelly sand. Deposited as outwash.

Qtca **Qtcb**
Twin Cities Formation
Till deposited by ice of the Grantsburg Sublobe with local pockets of sand and gravel. Qtca, complex mixture of light gray till, reddish-brown till, and other related drifts. Qtcb, light gray till at surface, generally underlain by mixed light gray and reddish brown tills which are underlain in turn by reddish brown till.

Qh
Hillside Sand
Medium to coarse pebbly sand, locally cobbly. Outwash overridden by ice of the Grantsburg Sublobe.

Contact
Dashed where approximately located

Indefinite contact
Includes gradational, inferred, and indefinite contacts

(Operative) (Inoperative)
Gravel pit or borrow pit
G, indicates gravel and sand; S, indicates sand only; T, indicates till

Abandoned Quarry

Base map by Topographic Division, U. S. Geological Survey, 1952, with additions by J. E. Stone, 1964.

Topography from aerial photographs by Kelsh plotter
Aerial photographs taken 1947. Field check 1952

Polyconic projection. 1927 North American datum
10,000-foot grid based on Minnesota coordinate system, south zone

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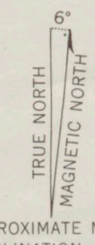

APPROXIMATE MEAN DECLINATION, 1952

GEOLOGIC MAP OF THE NEW BRIGHTON QUADRANGLE, MINNESOTA

SURFICIAL GEOLOGY

By

J. E. Stone

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

Geology mapped in 1962 and 1963

QUADRANGLE LOCATION