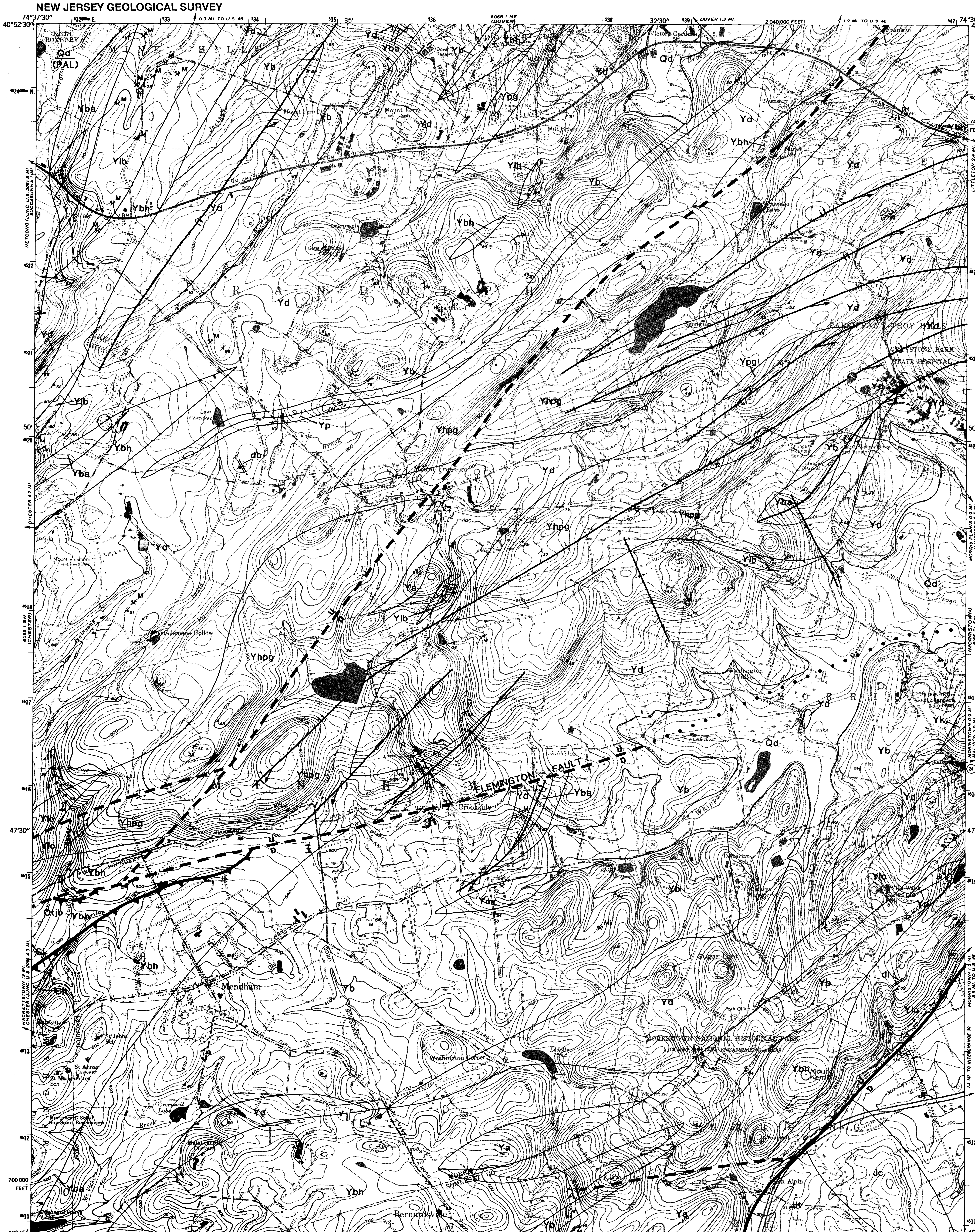
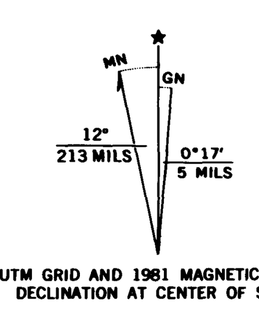
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
NEW JERSEY GEOLOGICAL SURVEY

GEOLOGIC MAP OF THE MENDHAM QUADRANGLE, MORRIS COUNTY, NEW JERSEY

GEOLOGIC MAP SERIES 88-3

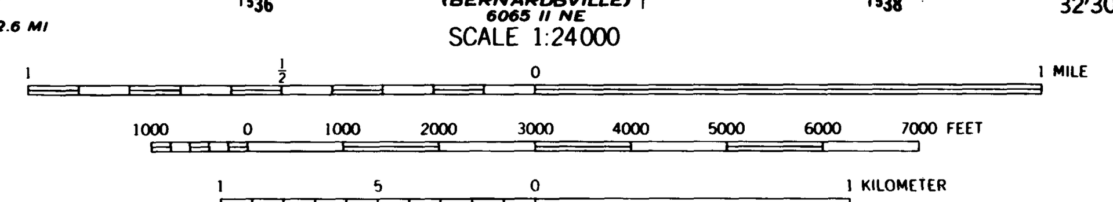


Base map from U.S. Geological Survey, 1954
Photorevised, 1981
10,000-foot grid based on New Jersey coordinate system
1000-meter Universal Transverse Mercator grid tics, zone 18



UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24000



CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

QUADRANGLE LOCATION

Geology mapped 1985-1986 by Richard A. Volkert

GEOLOGIC MAP OF THE MENDHAM QUADRANGLE,
MORRIS COUNTY, NEW JERSEY

by Richard A. Volkert, 1988

DESCRIPTION OF MAP UNITS

Qd — **Quaternary deposits** - Pleistocene glacial and interglacial deposits including clay, silt, sand, gravel, till, and colluvium and alluvium of Holocene age. Not shown where bedrock is Jt or Jc. Qd (PAL) denotes Quaternary deposits overlying undifferentiated Paleozoic rocks of the Green Pond Outlier.

db,dl — **Dikes** - Thin, dark-gray, fine-grained to aphanitic basaltic (db) and lamprophyric (dl) dikes which intrude Middle Proterozoic rocks. Age is uncertain.

Rocks of the Newark Basin

Jt,Jc — **Newark Supergroup (undifferentiated)** - Sandstone, siltstone, and mudstone of the Towaco Formation (Jt) and conglomerate and conglomeratic sandstone with clasts of reddish-brown and green shale and lesser quartz pebbles in a matrix of shale chips and clay (Jc).

Rocks of the Peapack Klippe

Otjb — **Jutland Klippe upper unit B** (Perissoratis and others, 1979; Lyttle and Epstein, 1987; Avery A. Drake, personal communication) - Heterogeneous sequence of interbedded red and green shale, interlaminated limestone and shale, interbedded fine-grained sandstone, siltstone, and yellow, red, green, tan, and gray shale.

Rocks of the Green Pond Outlier

PAL — **Paleozoic (undifferentiated)** - Most probably quartzite and dolomitic sandstone of the Hardyston Quartzite and dolomite and dolomitic shale to dolomitic sandstone of the Leithsville Formation (Bayley and others, 1914).

Rocks of the Lehigh Valley Sequence

Єl — **Leithsville Formation** - Light- to dark-gray weathering, fine- to medium-crystalline, thin- to medium-bedded dolomite, interbedded with thin dolomitic shale and dolomitic sandstone.

Єh — **Hardyston Quartzite** - Medium- to light-gray, fine-grained quartzite, arkosic sandstone, and dolomitic sandstone.

Rocks of the Reading Prong

Byram Intrusive Suite

Ybh — **Hornblende granite** - Medium- to coarse-grained, pink to buff, gneissoid to indistinctly foliated granite and sparse granite gneiss composed principally of microcline microperthite, quartz, oligoclase, and hornblende. Contains small boaies of pegmatite and amphibolite not shown on map.

Yba — **Microperthite alaskite** - Medium- to coarse-grained, pink to buff, gneissoid to indistinctly foliated granite composed principally of microcline microperthite, quartz, and oligoclase. Contains small bodies of amphibolite not shown on map.

Intrusive Rocks

Ypg — **Pyroxene granite** - Medium- to medium-coarse-grained, buff to greenish-gray, gneissoid to indistinctly foliated granite composed of mesoperthite to microantiperthite, quartz, oligoclase, clinopyroxene, and in some rocks, hornblende. Contains small bodies of alaskite and amphibolite not shown on map. Relative age and relationship to rocks of the Byram Intrusive Suite unknown.

Metasedimentary Rocks

Ymr — **Marble** - Coarse-crystalline, white to grayish-white, calcitic to dolomitic marble with accessory graphite, phlogopite, serpentine, and garnet.

Yp — **Pyroxene gneiss** - Medium-fine- to medium-grained, greenish-gray, white weathering, well-layered gneiss composed of oligoclase, clinopyroxene and variable amounts of quartz.

Yb — **Biotite-quartz-feldspar gneiss** - Medium-grained, gray to tan, locally rusty weathering, well-layered and foliated gneiss which is variable in texture and composition. Composed of oligoclase, microcline microperthite, quartz, and biotite. Locally contains garnet, graphite, and sillimanite. Unit is interlayered with metaquartzite south of the Flemington fault.

Yk — **Potassic feldspar gneiss** - Medium-fine- to medium-grained, tan to pinkish-white, moderately foliated rock composed principally of quartz, microcline, and lesser oligoclase.

Losee Metamorphic Suite

Ylo — **Quartz-oligoclase gneiss** - Medium- to coarse-grained, white to light-greenish-gray, well-layered gneiss composed of quartz, oligoclase, and sparse hornblende, chlorite, and altered clinopyroxene. Locally contains amphibolite layers.

Ylb — **Biotite-quartz-oligoclase gneiss** - Medium-fine- to medium-grained, greenish-gray, massive, moderately layered, well foliated gneiss containing oligoclase, quartz, biotite and locally garnet. Commonly interlayered with amphibolite.

Rocks of Uncertain Origin

Ya — **Amphibolite** - Medium-grained, gray to grayish-black rock composed of hornblende and andesine. Locally contains biotite. Associated with all Middle Proterozoic rocks in the map area.

Yhpg — **Hornblende-pyroxene-granite gneiss** - Medium- to medium-coarse-grained, greenish-buff to grayish-tan, massive, moderately foliated rock composed of clinopyroxene, hornblende, quartz, and microperthite. Intercalated with amphibolite and less commonly with hornblende-quartz-feldspar gneiss. Appears spatially associated with diorite. May be a contaminated phase of hornblende granite. Relative age unknown.

Yd — **Diorite** - Medium- to coarse-grained, greenish-gray to brownish-gray, greasy-lustered, massive to moderately foliated diorite to quartz diorite composed of andesine or oligoclase, clinopyroxene, hornblende, hypersthene, sparse biotite and variable amounts of quartz. Amphibolite and mafic-rich quartz-plagioclase gneiss layers are common.

MAP SYMBOLS

Contact - Dashed where approximate; dotted where concealed

Fault - Dashed where approximate; dotted where concealed

Tear fault - Arrows indicate relative horizontal movement

High angle fault - U: upthrown side; D: downthrown side.

Inclined thrust fault - Sawteeth on upper plate

Antiform - Showing crestline and direction of plunge

Synform - Showing troughline and direction of plunge

Overturned antiform - Showing trace of axial surface, direction of dip and limbs, and direction of plunge.

Overturned synform - Showing trace of axial surface, direction of dip and limbs, and direction of plunge.

Minor folds - Showing plunge of axis

Strike and dip of crystallization foliation

Inclined

Vertical

Strike and dip of mylonitic foliation

Strike and dip of bedding

Bearing and plunge of mineral lineation in Proterozoic rocks

Abandoned mine - M: magnetite; Mi: mica prospect

Abandoned stone quarry

Dike

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NOTES

The interpretations presented here were prepared for the "Bedrock Geologic Map of New Jersey," to be published at a scale of 1:100,000. They are presented here provisionally at a scale of 1:24,000.