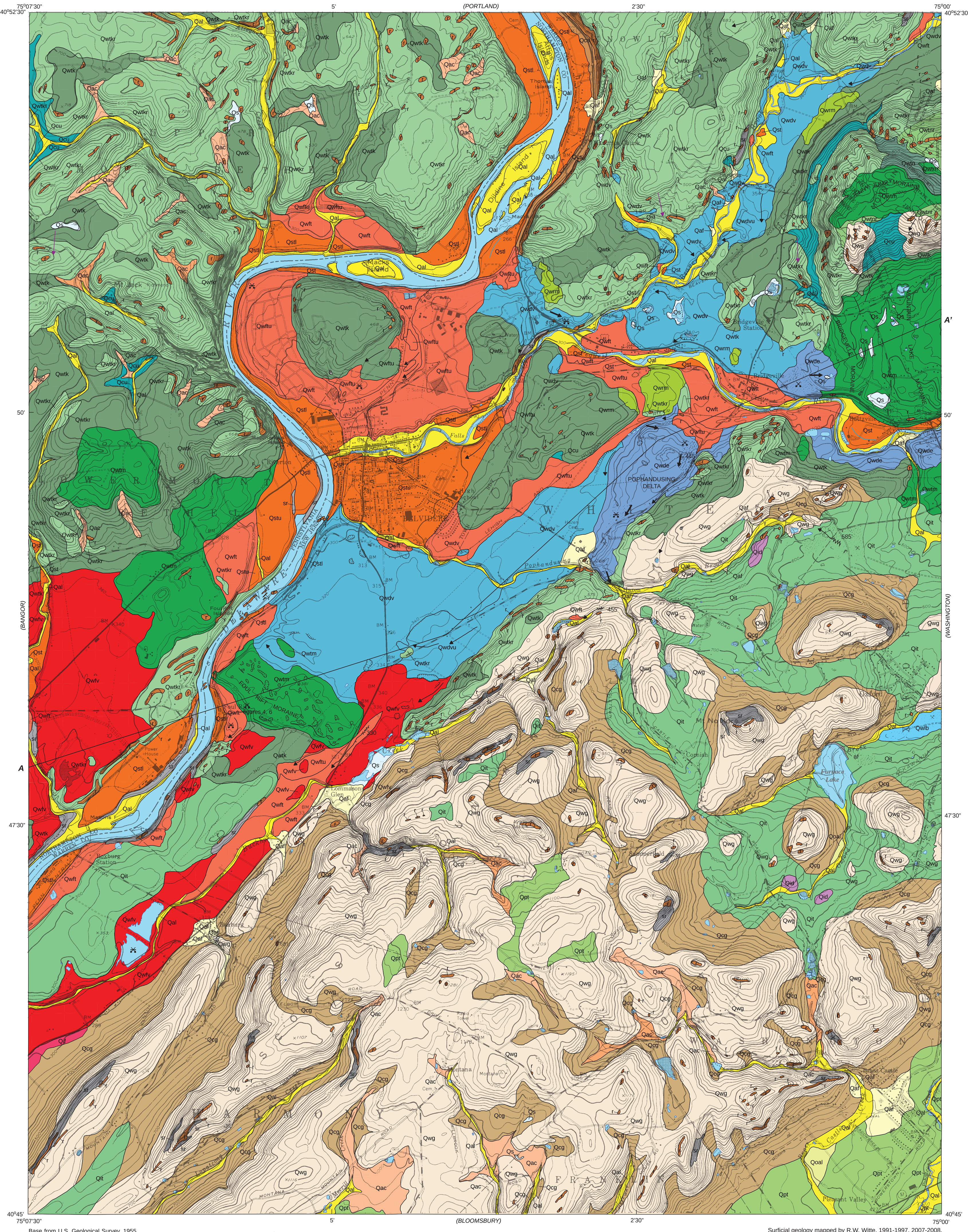
Prepared in cooperation with the
U.S. GEOLOGICAL SURVEY
NATIONAL GEOLOGIC MAPPING PROGRAM

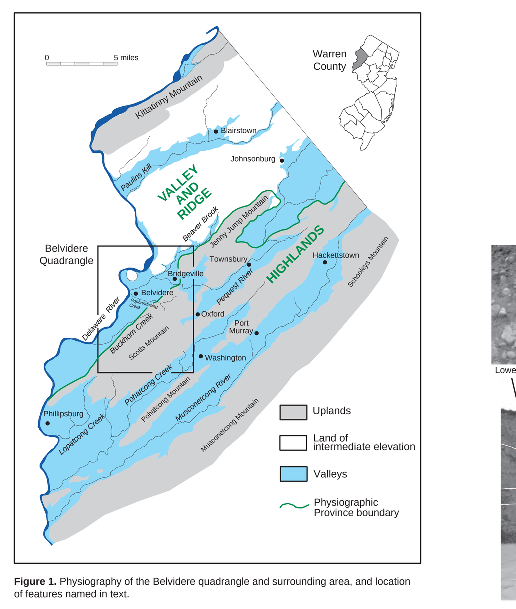
PREFACE

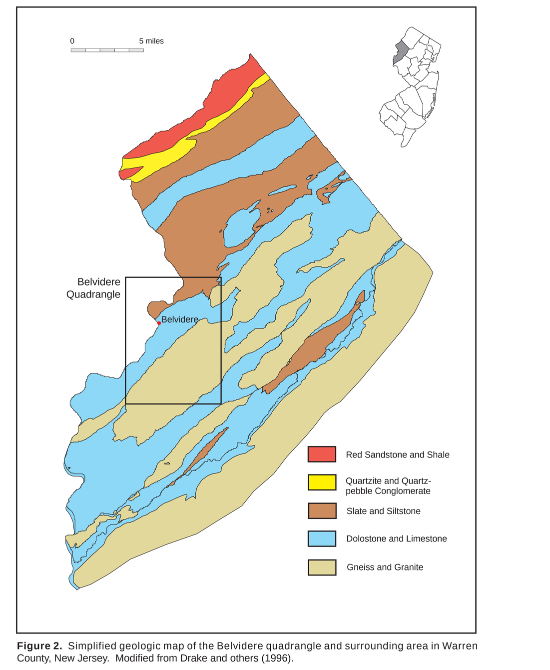
Industrial, commercial, and residential expansion in New Jersey has promoted the increased use of surficial geologic data for land use planning, identification, management, and protection of groundwater resources, siting for solid waste disposal, development of geologic aggregate, contaminant remediation, and delineation of geologic hazards.

DESCRIPTION OF MAP UNITS

Map units denote unconsolidated deposits more than 5 feet (1.5 m) thick. Color designations are based on Munsell Soil Color Charts (1975), and were determined from naturally moist samples.







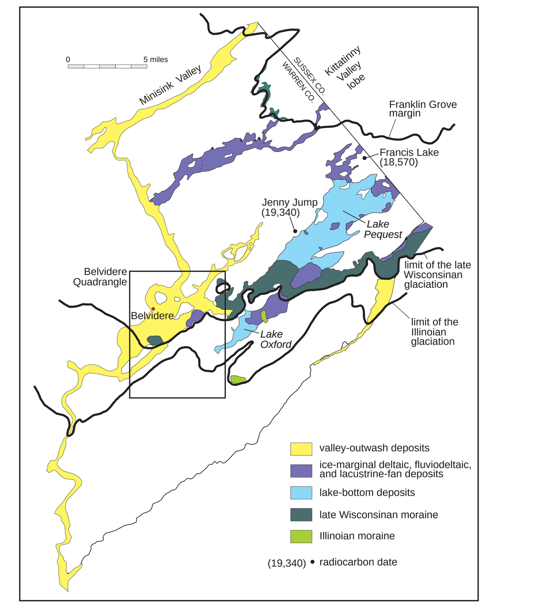


Figure 1. Physiography of the Belvidere quadrangle and surrounding area, and location of features named in text.

Figure 2. Bedrock geology of the Belvidere quadrangle and surrounding area in Warren County, New Jersey.

Base from U.S. Geological Survey, 1955.
Topography from aerial photographs by photogrammetric methods.
Photorevised from aerial photographs taken 1971.
Polyconic projection. 1927 North American Datum.

APPROXIMATE MEAN DECLINATION, 2021

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

QUADRANGLE LOCATION

Surficial geology mapped by R.W. Witte, 1991-1997, 2007-2008, and 2014, and J. C. Ridge, 1982.

GIS application by M. Girard, New Jersey Geological and Water Survey. Digital cartography by R.W. Witte, New Jersey Geological and Water Survey.

Research supported by the U. S. Geological Survey, National Cooperative Geologic Mapping Program, under USGS award number 1434-HQ-97-AG-01504. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U. S. Government.

SURFICIAL GEOLOGIC MAP OF THE BELVIDERE QUADRANGLE, WARREN COUNTY, NEW JERSEY AND NORTHAMPTON COUNTY, PENNSYLVANIA
SHEET 1: GEOLOGIC MAP

By

RON W. WITTE[1] and JOHN C. RIDGE[2]

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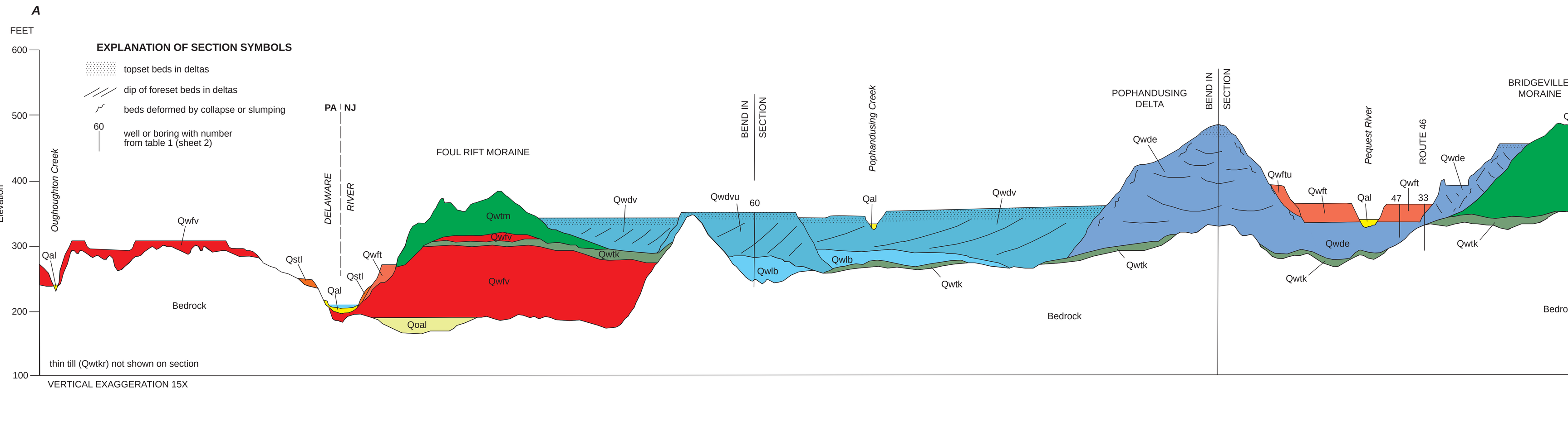
2021

EXPLANATION OF SECTION SYMBOLS

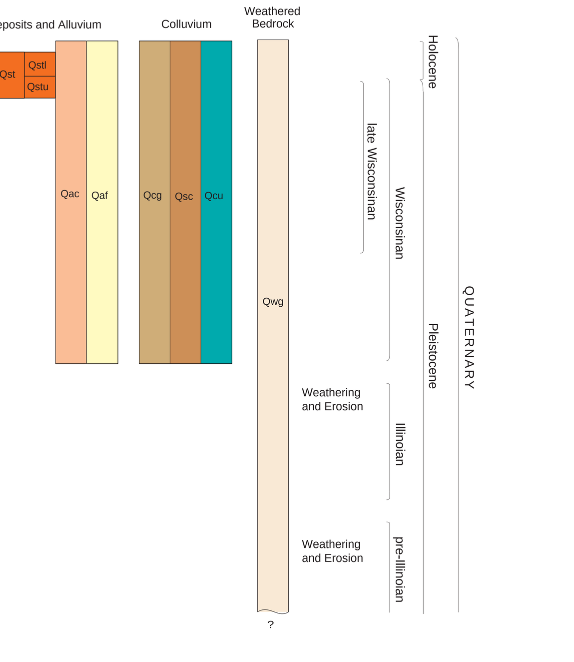
topset beds in deltas

dip of foreset beds in deltas

beds deformed by collapse or slumping



CORRELATION OF MAP UNITS



REFERENCES

DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER RESOURCES MANAGEMENT
NEW JERSEY GEOLOGICAL AND WATER SURVEY

Prepared in cooperation with the
U.S. GEOLOGICAL SURVEY
NATIONAL GEOLOGIC MAPPING PROGRAM

Table 1. Records of selected wells in the New Jersey part of the Belvidere quadrangle. The listed wells were drilled for private and public water supply, and exploration. Wells listed with a NJDEP permit number are from the files of the Bureau of Water Allocation and Well Permitting, Division of Water Supply and Geoscience, New Jersey Department of Environmental Protection. All other records are from exploratory borings that are on file at the New Jersey Geological and Water Survey. The location of wells listed with NJDEP numbers are based on tax maps, and they are generally accurate to 500 feet of the actual location. The location of exploratory borings (EB) are based on detailed site maps, and they are generally accurate to 100 feet of the actual location.

Well No.	NJDEP permit number	Discharge reported by driller in gallons per minute	Depth in feet below land surface	Driller's Log
1	24-24085	30	0-114 114-348	sand, gravel, clay, and silt slate
2	24-22928	30	0-55 55-100 100-134 134-150	sand and gravel gray clay clay shale
3	24-23978	19	0-22 22-40 40-130 130-144 144-165	clay and gravel gravel soft silt and clay broken slate slate
4	24-4078	none reported	0-47 47-103 103-113	sand and cobbles blue clay gravel
5	24-13378	8	0-90 90-180 180-200 200-248	gray clay and gravel granite brown granite soft sandstone with layers of hardpan
6	EB	none reported	0-91	depth to rock
7	EB	none reported	0-118	depth to rock
8	EB	none reported	0-117	depth to rock
9	EB	none reported	0-112	depth to rock
10	EB	none reported	0-128	depth to rock
11	EB	none reported	0-90	gravel
12	EB	none reported	0-38 38-39 39-72	brown fine to medium sand clay fine to medium sand, and some gravel
13	EB	none reported	0-109	depth to rock
14	EB	none reported	0-84	depth to rock
15	EB	none reported	0-115	gravel
16	EB	none reported	0-37 >37	gravel rock
17	EB	none reported	0-124	depth to rock
18	EB	none reported	0-125	depth to rock
19	EB	none reported	0-147	sand and gravel
20	EB	none reported	0-151	depth to rock
21	EB	none reported	0-147	depth to rock
22	EB	none reported	0-145	depth to rock
23	EB	none reported	0-145	depth to rock
24	EB	none reported	0-118	gravel
25	EB	none reported	0-140	sand and gravel
26	24-850	40	0-35	sand and gravel
27	24-1154	8	0-93	sand and gravel
28	24-14655	8	0-22 22-68 68-160 160-198 198-300	brown soil and rock mix sand and gravel brown clay brown sand and gravel limestone
29	24-13691	20	0-20 20-73	sand and gravel limestone
30	24-15502	12	0-82 82-104 104-175	sand and gravel brown clay and rock mix limestone
31	24-1153	10	0-20 20-57	gravel and boulders hard limestone
32	24-5476	20	0-20 20-50	overburden with boulders sand and gravel
33	24-15097	25	0-2 2-20 20-30 30-73	overburden sand and gravel heavy gravel granite
34	24-17094	18	0-38 38-220	sand, clay, and gravel soft yellow and gray limestone
35	24-5553	11	0-157 157-160	sand, gravel, and boulders rock
36	24-19526	none reported	0-138 >138	sand, brown clay, and gravel rock
37	24-17188	none	0-100	clay and gravel
38	24-15789	12	0-15 15-82 82-162	brown soil sand and gravel limestone
39	24-21579	15	0-20 20-120 120-160	topsoil and boulders silt and clay gravel
40	24-16030	8	0-25 25-90 90-165 165-178 178-200	brown soil and rock sand and gravel brown clay brown soil and rock limestone
41	24-16962	10	0-68 68-144	sand and gravel limestone
42	24-6082	10	0-155	hardpan and gravel
43	24-21434	2	0-25 25-60 60-200 200-275 275-297 297-568	clay and boulders silt and gravel silt, granite ledges, and sand silt broken granite granite
44	24-18073	5	0-1 1-80 80-270 270-300	topsoil sand and gravel bouldery clay rotten shale
45	24-14170	6	0-3 3-30 30-40 40-45 45-50 50-448	overburden sand and gravel large gravel sand and gravel large gravel gneiss
46	24-15471	30	0-15 15-51	clay gravel
47	24-6083	20	0-28 28-48	sand and gravel gravel
48	EB	none reported	0-6 6-25 25-40 40-57	soil brown fine sand, some silt, trace of clay decomposed bedrock gneiss
49	EB	none reported	0-1 1-18 18-34 34-38 38-43	topsoil brown fine sand and some silt gray silt and clay decomposed bedrock amphibolite
50	EB	none	0-2	soil
51	EB	none reported	0-2 2-8 8-13 13-27 27-35	soil clay and silt, some gravel same as above but with increasing cobbles grayish brown to light brown dense, massive clay gravel and some clay, occasional boulder
52	EB	none reported	0-2 2-17 17-45 45-52	topsoil brown fine gravel and fine to coarse sand, some silt brown fine sand, trace to some silt with cobbles and boulders brown and gray silty clay with trace very thin sand seams
53	EB	none reported	0-90 >90	sand and gravel rock
54	24-18692	20	0-75 75-100	gravel broken limestone
55	24-17395	12	0-3 3-103	clay gravel
56	24-24346	25	0-15 15-28 28-190	sand, clay, and boulders sand and gravel limestone
57	24-14207	25	0-10 10-30 30-36 36-252	sand, gravel, and cobblestones sand and cobblestones stones and large rocks limestone
58	24-17521	40	0-110	gravel
59	24-15329	200	0-80 80-350 350-375	overburden limestone void
60	24-16865	25	0-65 65-90 90-102	sand and gravel clay limestone
61	24-17573	9	0-41 41-100	overburden limestone
62	24-9303	60	0-100	sand and gravel
63	24-16275	6	0-85 85-188	sand and clay sandstone
64	24-17032	12	0-70 70-132	clay and sand sandstone
65	24-13830	none reported	0-30 30-85	clay and sand granite
66	24-17112	15	0-75 75-100	clay limestone
67	24-9902	24	0-74 74-94 94-105	sand and gravel white clay and gray rock limestone
68	24-9901	22	0-34	sand and gravel
69	EB	none reported	0-99	sand and gravel
70	EB	none reported	0-95	sand and gravel
71	24-13013	13	0-60 60-275	sand and loose rock granite
72	24-14955	50	0-20 20-35 35-78	clay sandstone gray granite
73	24-12175	20	0-30 30-40 40-124	overburden and sand sandstone granite

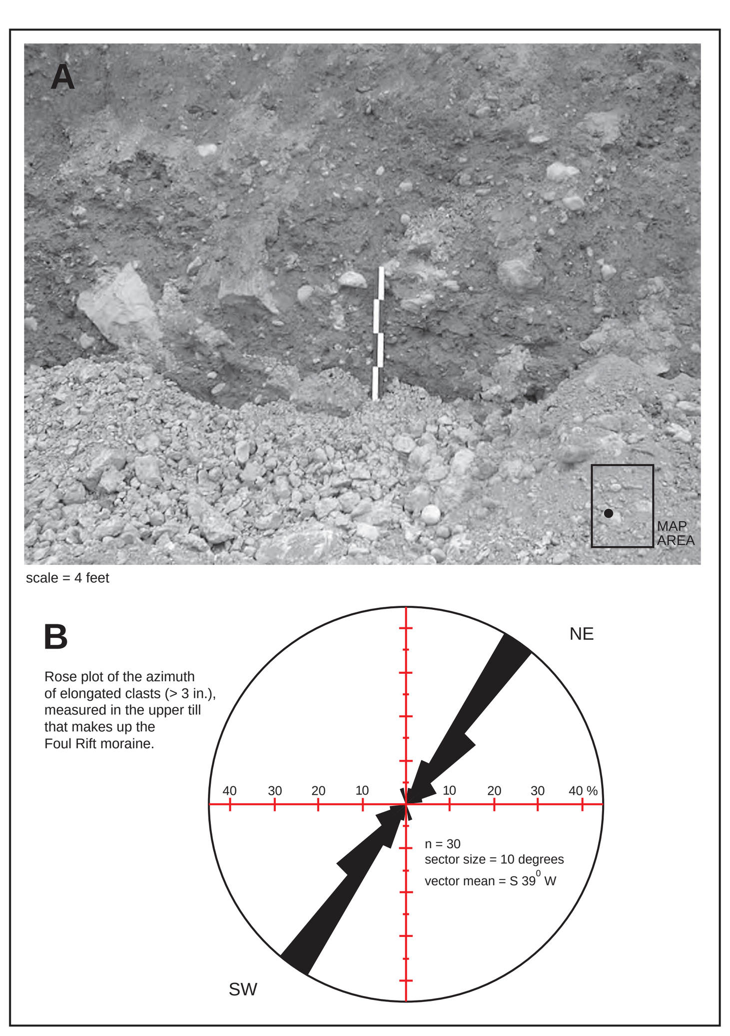
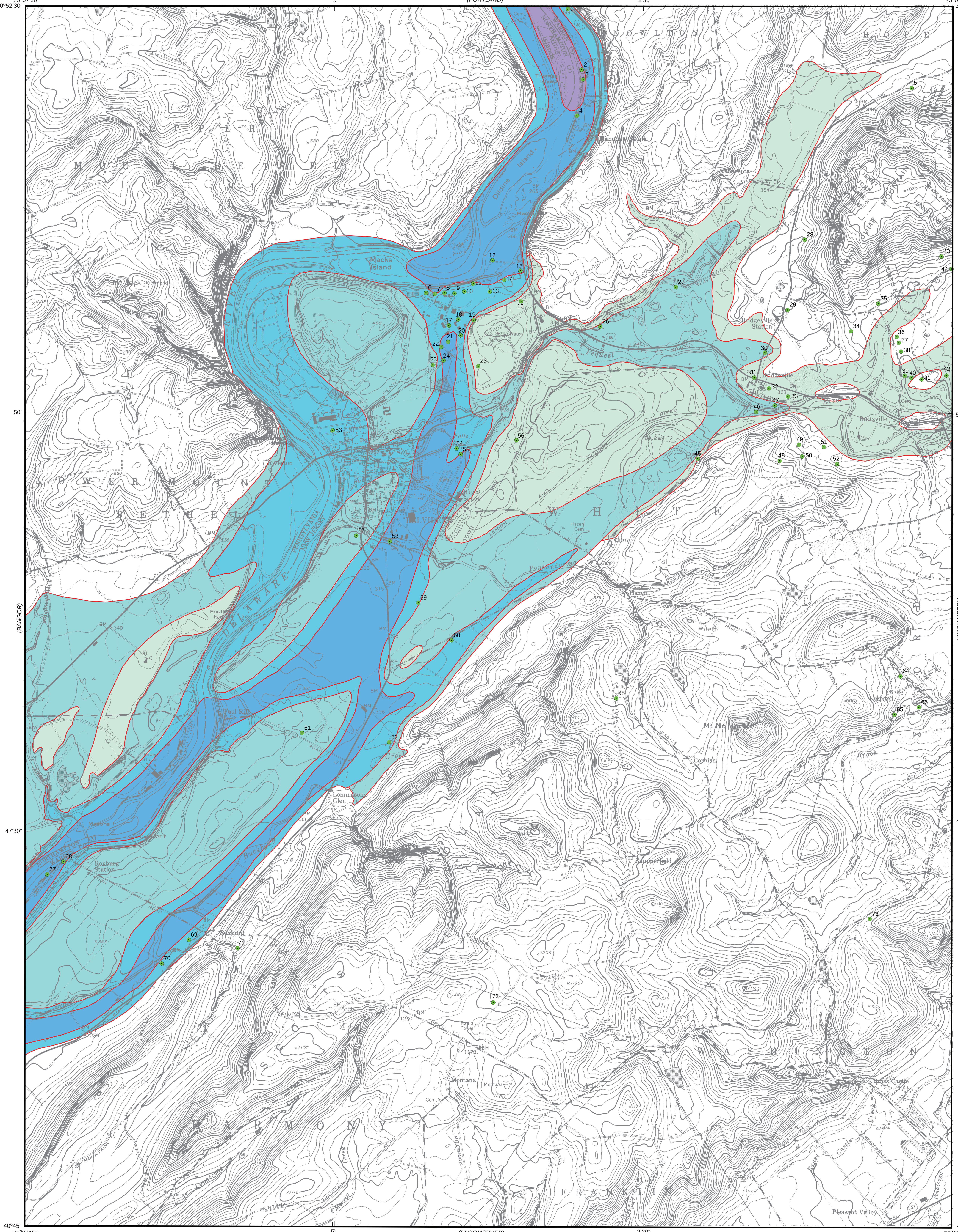


Figure 6. Upper till exposed along the north rim of the Foul Rift pit (A), and rose plot showing alignment of long axes of elongate clasts in the till (B). The till has a compact, fissile, sandy-silty matrix containing by volume 7 to 10 percent subangular to subrounded stones. Many stones are striated and elongated clasts have a pronounced downvalley fabric. Although the till forms part of the Foul Rift moraine, it has characteristics of a basal till. It may represent a subglacial till facies associated with a push moraine.



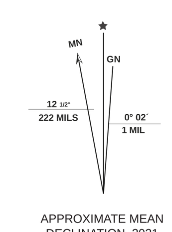
EXPLANATION OF MAP SYMBOLS

25 ● Well or boring with log in Table 1.

Approximate elevation of bedrock surface beneath thick valley fill. Based on records of wells and boring (Table 1), location of rock outcrop and thin till areas, and data in adjoining quadrangles (Witte and Stanford, 1995), Elevation of bedrock surface at wells is determined by subtracting the depth to bedrock reported in well and boring logs from the ground surface elevation of the well or boring. Contour interval 50 feet.

- 100-150 feet
- 150-200 feet
- 200-250 feet
- 250-300 feet
- 300-350 feet

Base from U.S. Geological Survey, 1955.
Topography from aerial photographs by photogrammetric methods.
Photorevised 1971 from aerial photographs taken 1971.
Polyconic projection. 1927 North American Datum.



SCALE 1:24000

1 1/2 0 1 mile
1000 0 1000 2000 3000 4000 5000 6000 7000 feet
1 1/2 0 1 kilometer

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

Elevation of bedrock surface mapped by R. W. Witte, 1991-1997.

GIS application and digital cartography by R. W. Witte and M. Girard, 2014.

Research supported by the U. S. Geological Survey, National Cooperative Geologic Mapping Program, under USGS award number 1434-HQ-97-AG-01504. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U. S. Government.

SURFICIAL GEOLOGIC MAP OF THE BELVIDERE QUADRANGLE, WARREN COUNTY, NEW JERSEY AND NORTHAMPTON COUNTY, PENNSYLVANIA
SHEET 2: ELEVATION OF BEDROCK SURFACE

By

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2021