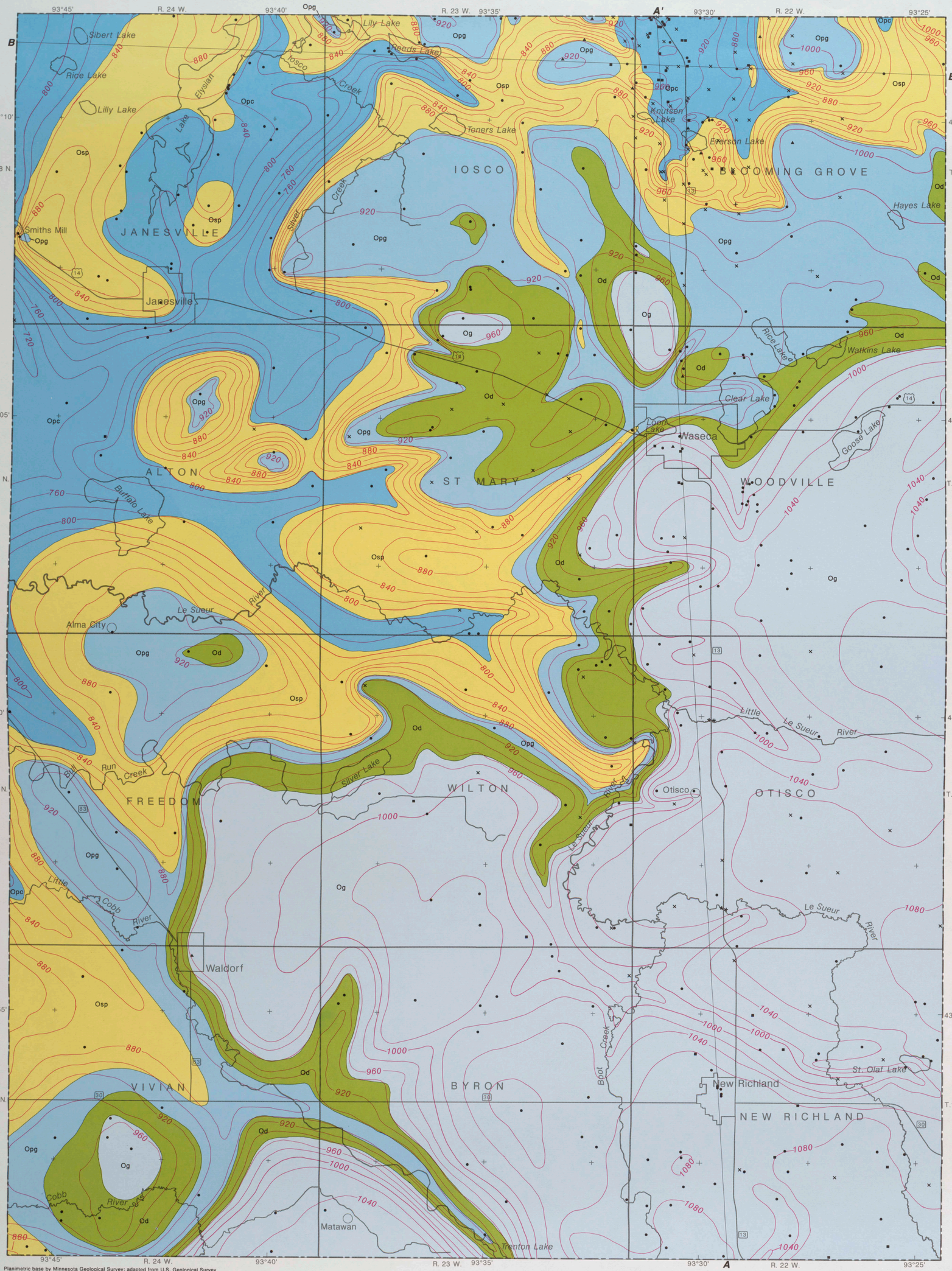
UNIVERSITY OF MINNESOTA
MINNESOTA GEOLOGICAL SURVEY
Priscilla C. Grew, Director

MISCELLANEOUS MAP SERIES
MAP M-73, PLATE 1 OF 3

BEDROCK GEOLOGIC MAP

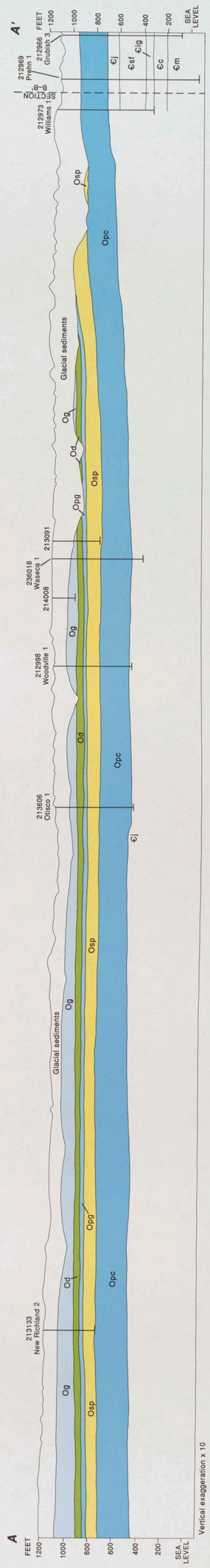


Planimetric base by Minnesota Geological Survey; adapted from U.S. Geological Survey 1:24,000 topographic quadrangles: Elysian 1966/1977, Freeborn 1967, Hartland 1967, Janesville 1966, Madison Lake 1974, Mapleton NE 1967, Matawan 1967, Meriden 1962, Minnesota Lake 1977, Morristown 1962, New Richland 1967, Otisco 1967, St. Clair 1974, Waldorf 1967, Waseca 1966, and Waterville 1966

Polyconic projection. 1927 North American datum

SCALE 1:62500

Geology compiled in 1974, 1982, and 1992
Edited and designed by Lynn Swanson
Cartography by Philip Heywood



EXPLANATION

ERA	SYSTEM	SERIES	GROUP, FORMATION, & MEMBER	MAP SYMBOL	LITHOLOGIC COLUMN	THICKNESS IN FEET	LITHOLOGY
CENOZOIC	QUATERNARY	PLEISTOCENE				70 to 360	Glacial sediments, undifferentiated. Shown in cross sections only
							unconformity
PALEOZOIC	ORDOVICIAN	MIDDLE	Galena Group: Stewartville Formation & Prosser Limestone	Og		0 to 219	Limestone, very light gray to light gray, thin- to thick-bedded, fine-grained, fossiliferous (including bryozoans, articulate brachiopods, and conodonts)
			Galena Group: Cummingsville Formation	Og		62 to 87	Limestone, very light gray to light gray, fine-grained, fossiliferous; intercalated beds of olive green shale grade into top of underlying Decorah Shale
			Decorah Shale	Od		0 to 54	Shale, light gray to green gray, calcareous, fissile, fossiliferous (including bryozoans, brachiopods, crinoids, conodonts, and ostracodes); brassy oolites noted in several layers, the most pronounced at or near top; thin intercalated beds of light gray coquinoid limestone in upper half. Unreroded thickness 49–54 ft
			Platteville Formation	Opg		0 to 20	Limestone, very light gray to light gray, very fine grained to fine-grained, fossiliferous (including bryozoans, brachiopods, conodonts, and ostracodes); intercalated greenish gray shale with trace amounts of phosphate pellets and pyrite in very thin to thin beds. Unreroded thickness 9–20 ft
			Glenwood Formation	Opg		0 to 15	Shale, light gray to light green gray, calcareous, sandy; fine to coarse quartz grains near base (coarse grains dark gray). Unreroded thickness 7–15 ft
			St. Peter Sandstone	Osp		64 to 78	Sandstone, white to light gray; composed of fine to coarse, well-rounded, well-sorted, frosted quartz grains
			St. Peter Sandstone	Osp		0 to 122	Unreroded thickness of entire St. Peter Sandstone 97–122 ft
						33 to 49	Sandstone, white to light gray; composed of fine to coarse, rounded to well-rounded, well-sorted quartz grains; intercalated beds of light gray shale and siltstone; dark gray, coarse-grained quartz grains common at or near base
							unconformity
		LOWER	Prairie du Chien Group: Shakopee Formation / New Richmond Mbr.	Opc		234 to 290	Dolomite, light gray to gray orange to light pink gray, very fine grained to fine-grained; sandy component composed of fine to coarse quartz grains; trace amounts of pyrite and glauconite; nonfossiliferous
							Sandstone, white to pink gray; composed of fine to coarse, well-rounded, moderately sorted quartz grains. Contact with overlying unit may be transitional; contact with underlying unit is a disconformity. Unit is discontinuous in county
			Prairie du Chien Group: Oneota Dolomite	Opc			Dolomite, pink gray to orange pink, fine- to medium-grained; trace amounts of pyrite, glauconite, and ooids of chert and dolomite; fine-grained, silty, argillaceous, sandy dolomite in basal 14–24 ft
							disconformity
			Jordan Sandstone	€j		77 to 94	Sandstone, white to light gray; composed of fine to coarse, moderately sorted, well-rounded quartz grains; single or multiple lenses of very fine grained to fine-grained, silty, slightly feldspathic to quartzose sandstone; nonfossiliferous. Uneroded thickness of lenses 6–27 ft. Shown in cross sections only
			St. Lawrence Formation	€sf		78 to 99	Dolomite, gray pink to pale red, very fine grained to fine-grained, silty, sandy; fine- to medium-grained quartz glauconite content ranges from just a few grains to 33%; fossiliferous (including inarticulate brachiopods). Shown in cross sections only
			Franconia Formation	€sf		129 to 155	Sandstone, red to green gray; composed of very fine to fine feldspathic grains; silty, glauconitic, dolomitic; fossiliferous (including inarticulate brachiopods). Medium to thick beds of pale red to gray red, very fine grained to fine-grained, silty, sandy, glauconitic dolomite. Shown in cross sections only
			Ironton & Galesville Sandstones	€ig		59 to 63	Sandstone, white to pink gray; composed of fine to coarse, frosted quartz grains; slightly silty; fossiliferous (including inarticulate brachiopods). Upper part (Ironton) is poorly sorted; lower part (Galesville) is moderately sorted and siltier. Shown in cross sections only
			Eau Claire Formation	€c		113 to 133	Siltstone, gray orange pink to red, sandy, dolomitic, glauconitic; minor amounts of shale and very fine to medium quartz grains; fossiliferous (including inarticulate brachiopods). Beds of very fine grained to medium-grained, silty, dolomitic, quartz sandstone at middle of unit; red sandy shale and/or shaly sandstone at or near base. Shown in cross sections only
			Mt. Simon Sandstone	€m		83 to 87	Sandstone, white to light orange pink; composed of fine to coarse, angular to well-rounded, poorly sorted grains; fossiliferous (including inarticulate brachiopods); intercalated pale red to light gray green shale with trace amounts of brassy oolites at top. Shown in cross sections only
			Mt. Simon Sandstone	€m		206 to 210	
			Mt. Simon Sandstone	€m		124 to 127	Sandstone, white to gray orange pink; composed of fine to coarse, angular to well-rounded quartz grains; poorly sorted; fossiliferous (including inarticulate brachiopods); trace amounts of brassy oolites; basal 20–25 ft predominantly yellow, granular quartz and quartz pebbles. Shown in cross sections only
							unconformity
MIDDLE PROTEROZOIC			Hinckley Sandstone	mPh		192 to 198	Sandstone, gray orange to pale red brown; composed of fine to coarse, angular to rounded quartz grains; a few intercalated beds of red brown shale. Shown in cross section B–B' only
			Fond du Lac Formation	mPf		more than 929	Sandstone, pink gray to pale red brown; composed of fine to coarse, poorly sorted, angular to subrounded quartz and feldspar grains; silty; intercalated beds of red brown shale and siltstone. Shown in cross section B–B' only

Dolomite — sandy, shaly
Limestone — shaly
Shale — sandy
Siltstone
Sandstone

Dolomitic
Calcareous
Glauconitic
Arkosic
Fossiliferous
Oolites
Pellets
Lenses
Pebbles
Unconformity or disconformity

Contact between geologic units—Approximately located

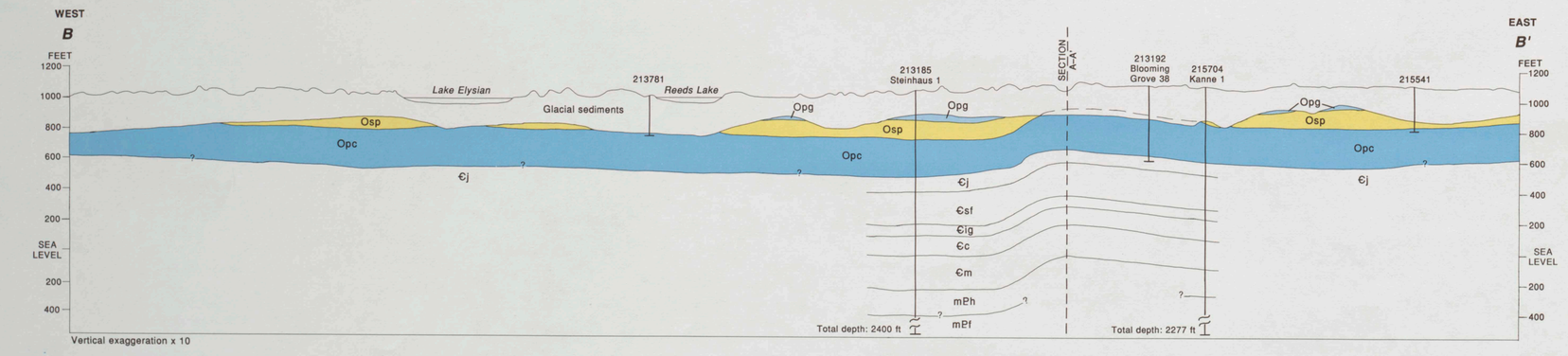
Contours on the bedrock surface—Contour interval 20 feet; datum is mean sea level

Sources of geologic data

- Water-well or test-hole record
- ▲ Water-well or test-hole record; also cuttings or core or both
- ■ Water-well or test-hole record; also downhole geophysical log
- × Water-well or test-hole record; also downhole geophysical log and cuttings or core or both
- ★ Soil boring

213185 Steinhaus 1 — **Water well or test hole**—In cross sections only. Six-digit "unique numbers" are assigned to water wells or test holes with stratigraphic information; named wells are Minnegasco test holes

A—A' **Line of geologic section**



Every reasonable effort has been made to ensure the accuracy of the factual data on which this map interpretation is based; however, the Minnesota Geological Survey does not warrant or guarantee that there are no errors. Users may wish to verify critical information; sources include both the references listed here and information on file at the offices of the Minnesota Geological Survey in St. Paul. In addition, effort has been made to ensure that the interpretation conforms to sound geologic and cartographic principles. No claim is made that the interpretation shown is rigorously correct, however, and it should not be used to guide engineering-scale decisions without site-specific verification

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BEDROCK GEOLOGY OF WASECA COUNTY, MINNESOTA

By
Bruce A. Bloomgren

1993