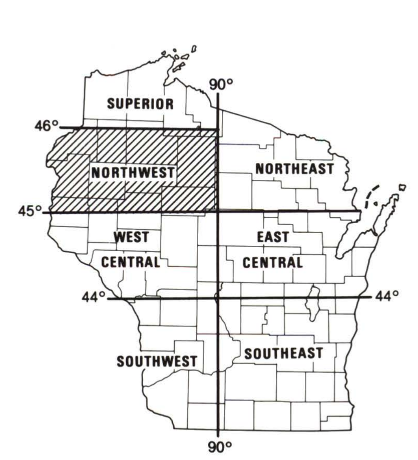

REGIONAL MAP SERIES

NORTHWEST SHEET

BEDROCK GEOLOGY OF WISCONSIN

M.G. Mudrey, Jr., G.L. LaBerge, P.E. Myers, and W.S. Cordua

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Wisconsin Geological and Natural History Survey
M094 • Sheet 1 of 2 (2012 reprint)

1987

Scale 1:250,000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

Base from U.S. Geological Survey, 1:250,000 quadrangle maps – RICE LAKE, WIS. (1980) and STILLWATER, MINN., WIS. (1980).

Cartography by D.L. Patterson

REGIONAL MAP SERIES

BEDROCK GEOLOGY OF WISCONSIN

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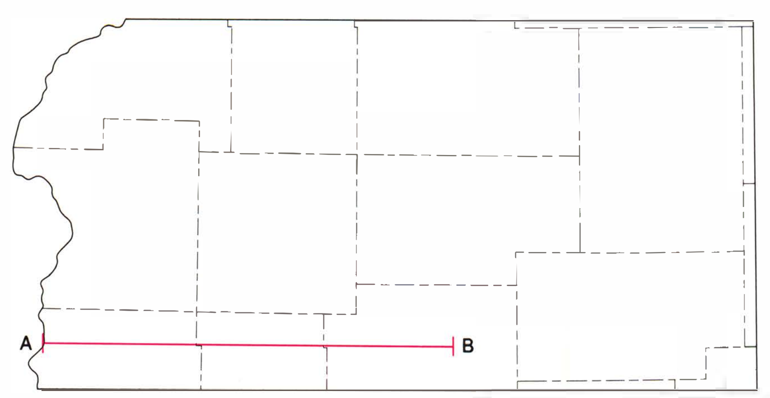
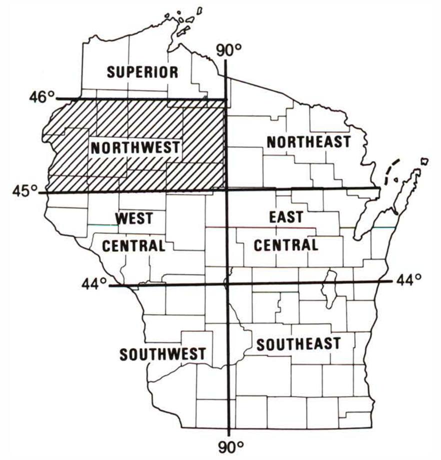
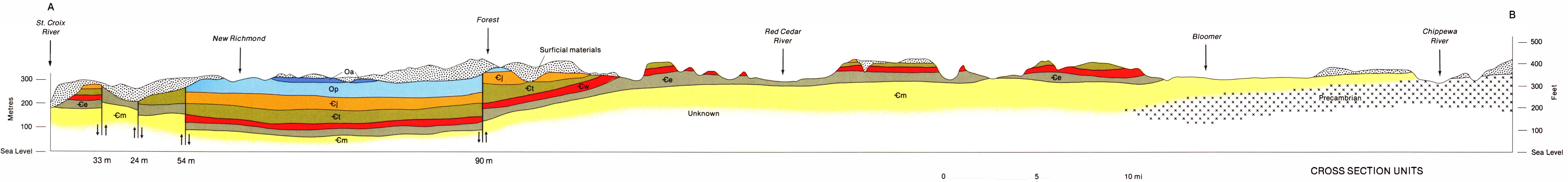
CROSS SECTION LOCATION





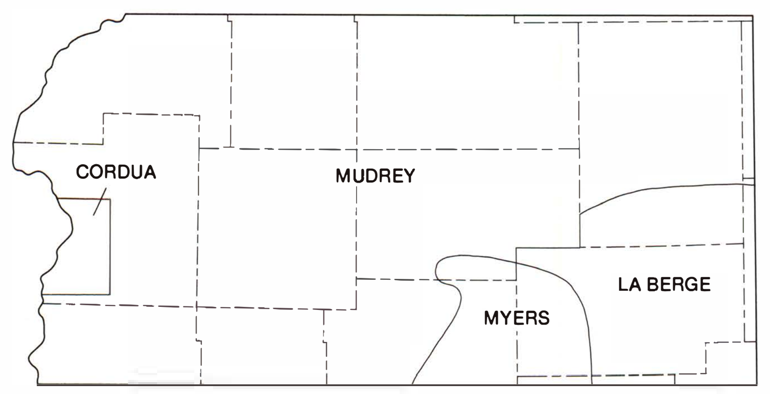


0 5 10 mi
0 5 10 km
Vertical exaggeration 20x

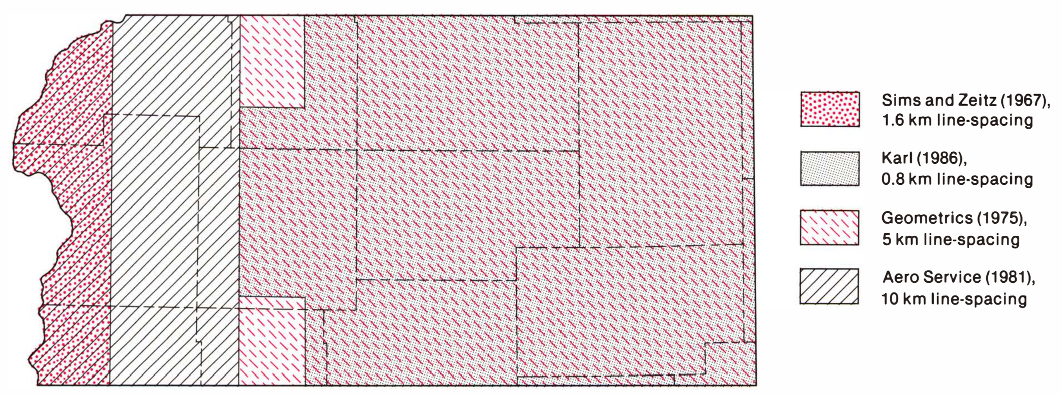
CROSS SECTION UNITS

Oa	Ancell Group	€w	Wonewoc Formation
Op	Prairie du Chien Group	€e	Eau Claire Formation
€j	Jordan and St. Lawrence Formations	€m	Mount Simon Formation
€t	Tunnel City Group		

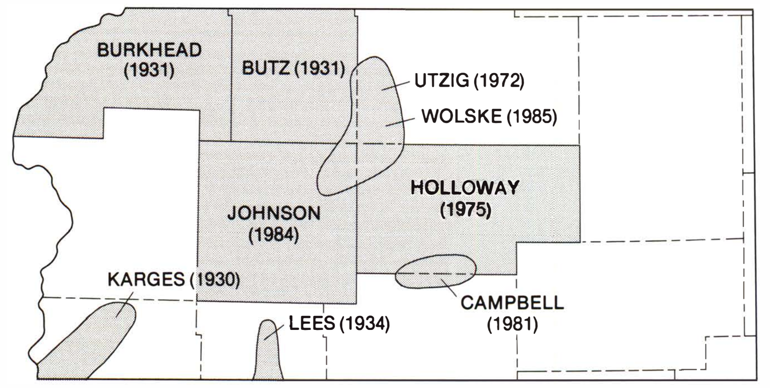
AUTHOR RESPONSIBILITY



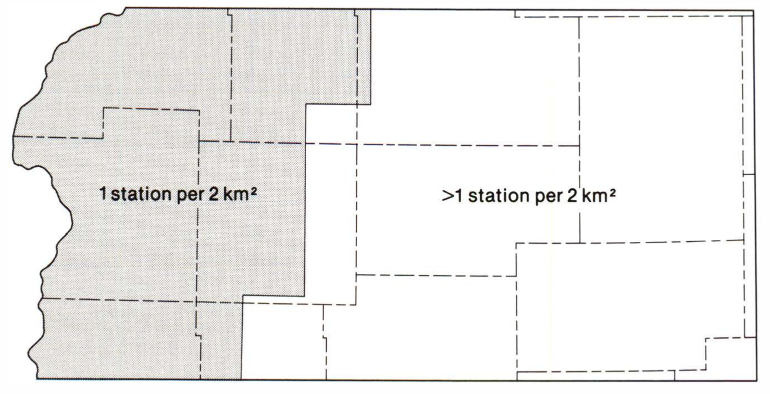
SOURCES OF AEROMAGNETIC DATA



AREAL THESIS STUDIES



DENSITY OF GRAVITY DETERMINATIONS (Ervin and Hammer, 1974)



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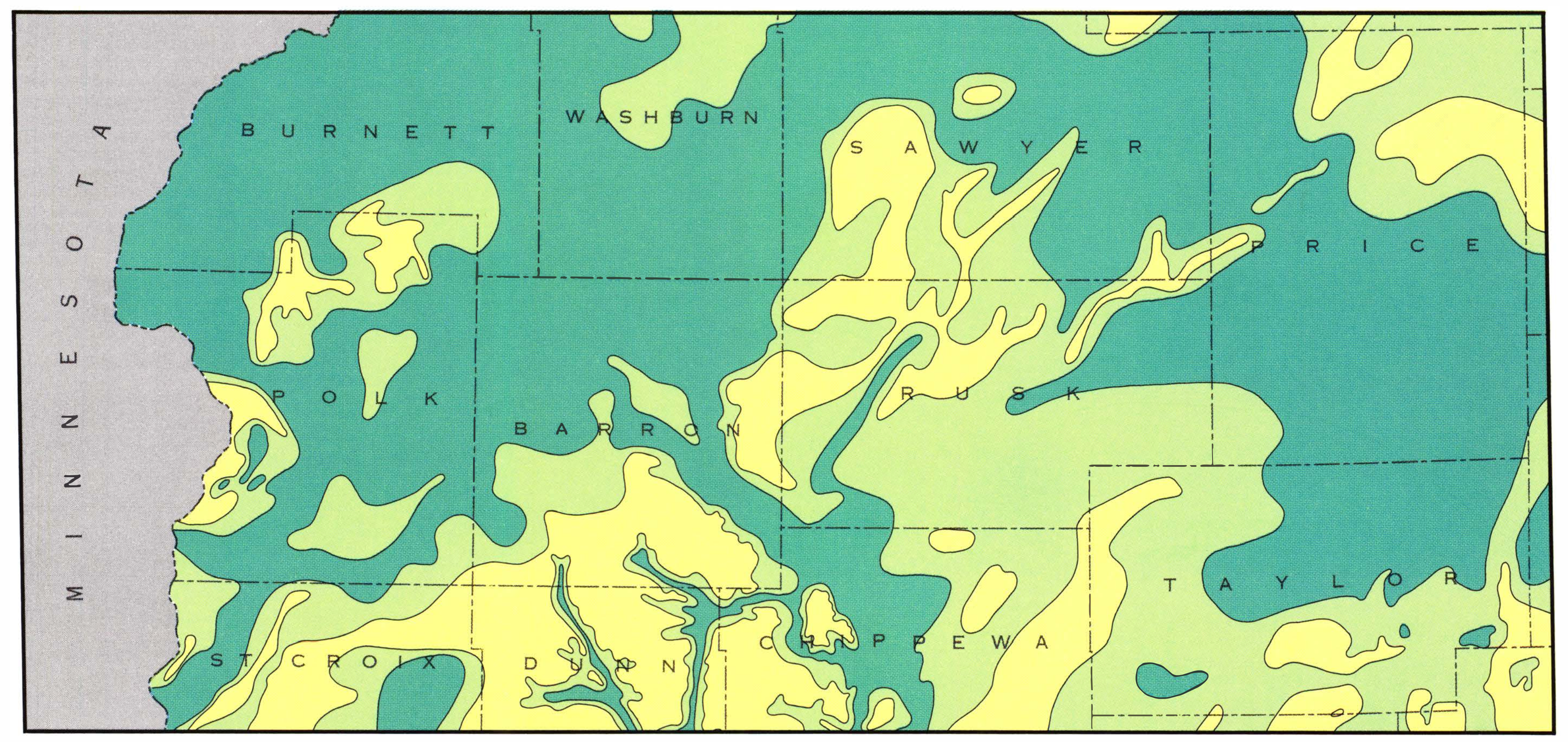
DEPTH TO BEDROCK



Modified from Trotta and Cotter (1973)

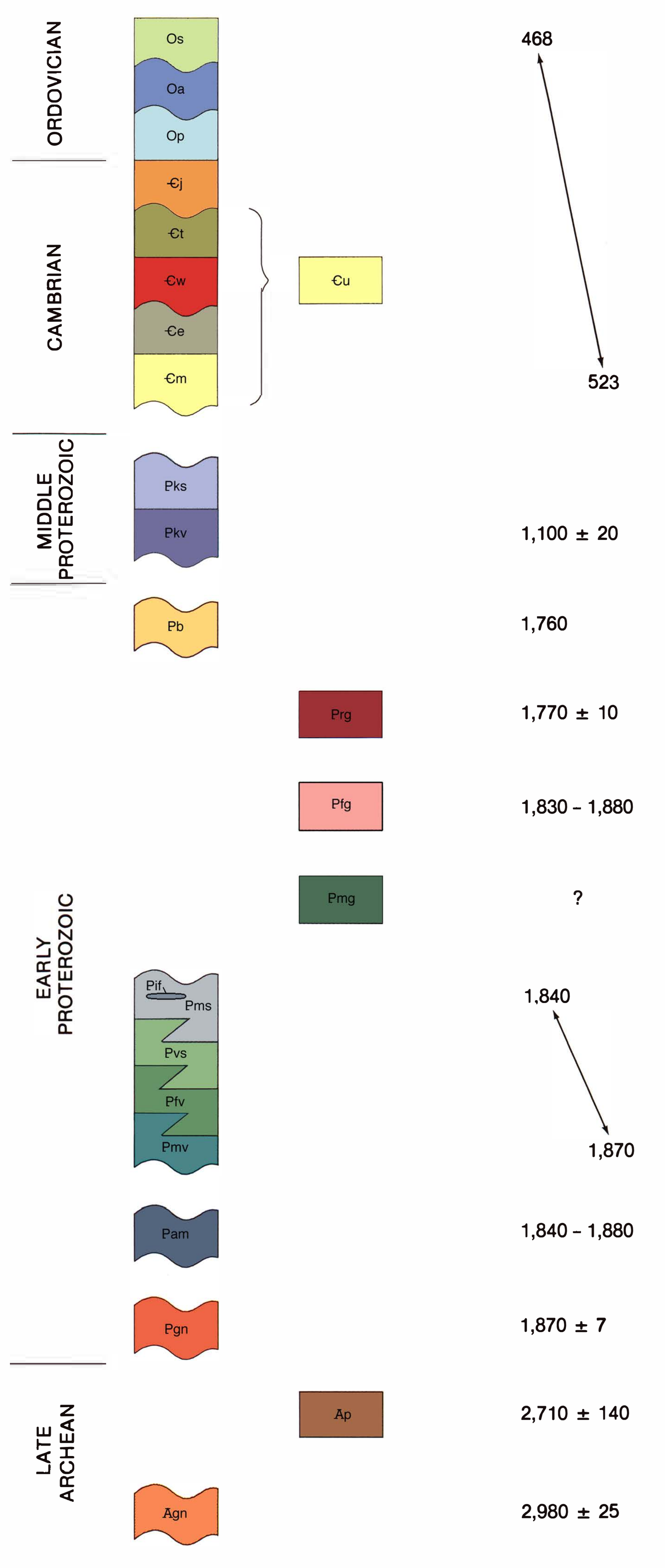
0-15 m — Generally good to excellent outcrop, particularly on hillsides, roadcuts, and in river valleys.

15-30 m — Poor to no outcrop. Outcrop may occur in isolated exposures, particularly in river valleys and bedrock highs. Shallow water wells commonly penetrate bedrock.

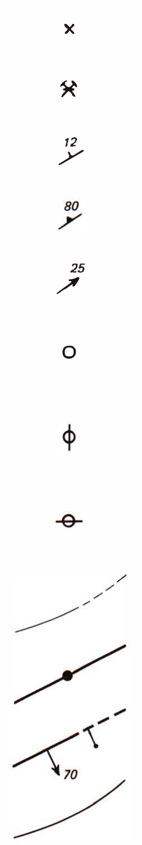
> 30 m — Generally no outcrop. Outcrop can occur only in deep river valleys and bedrock highs. Only mineral exploration boreholes and deep municipal well penetrate bedrock.

CORRELATION OF UNITS

Approximate age of unit (in million years)



MAP SYMBOLS



- Outcrop
- Mineral prospect pit
- Strike and dip of bedding
- Strike and dip of foliation
- Bearing and plunge of lineation
- Water well bore hole. Well constructor's reports were provided by the Wisconsin Department of Natural Resources.
- Mineral exploration bore hole. Core samples, drill cuttings, and access to company data were provided by the mineral industry.
- Highway construction borehole. Engineering records were provided by the Wisconsin Department of Transportation.
- Geologic contact: dashed where less certain. Inferred from aeromagnetic and gravimetric data in Precambrian area.
- Diabase dike, inferred from aeromagnetic data.
- Fault showing dip: dashed where concealed, ball and bar on downthrown side.
- Magnetic trend lines

DESCRIPTION OF MAP UNITS

Os — **Platteville Formation.** Dolomite, light brown, beds less than 1 m thick, fractured; about 4 m maximum thickness in this area.

Oa — **Ancell Group.** Sandstone, quartzose, white to pale yellow, fine grained, rounded, moderately sorted; 25 m thick.

Op — **Prairie du Chien Group.** Dolomite and sandy dolomite. Consists of three recognizable units, from top to bottom: **Shakopee Formation, Willow River Member**–dolomite, gray to brown, medium grained, thin-bedded; contains rounded flat pebbles of buff, fine-grained dolomite; 15 to 18 m thick. **Shakopee Formation, New Richmond Member**–sandstone and siltstone, brown to gray, fine grained, dolomitic, lenticular-bedded; contains coarse rounded and frosted quartz grains; 2 to 5 m thick. **Oneota Dolomite**–dolomite, gray, thick-bedded, crystalline; with much chert in discrete beds or in irregular masses throughout; with white to light gray oolite beds up to 60 cm thick in lower part; 27 m thick.

€j — **Jordan and St. Lawrence Formations.** Sandstone, quartzose, sandy dolomite, dolomite, and siltstone. Consists of four recognizable units, from top to bottom: **Jordan Formation, Coon Valley Member**–dolomite, yellow to tan or brown, sandy; 6 to 14 m thick. **Jordan Formation, Van Oser Member**–sandstone, quartzose, white to brown to yellow or orange, fine to medium grained, poorly sorted, medium- to thin-bedded, cross-bedded; with calcite-cemented nodules, iron-cemented in places; may be locally interbedded with underlying unit; 9 to 15 m thick. **Jordan Formation, Norwalk Member**–sandstone, quartzose, white, fine grained, rounded, and moderately sorted quartz sand grains, medium-bedded; trace of garnet; 15 to 18 m thick. **St. Lawrence Formation, Lodi Member**–siltstone, light brown to blue-brown, and very fine-grained dolomite, thick-bedded; less than 3 m thick.

€t — **Tunnel City Group.** Sandstone, 30 to 56 m thick. Consists of five recognizable, interbedded units: **Mazomanie Formation, lithology 1**–sandstone, quartzose, yellow to white, fine grained, well sorted, cross-bedded; less than 5 percent glauconite. **Mazomanie Formation, lithology 2**–sandstone, quartzose, mica-bearing, light gray to yellow, fine to very fine grained, thin-bedded; similar to Tomah Member but containing no shale; **Lone Rock Formation, Reno Member**–sandstone, quartzose, glauconite-bearing, fine and very fine grained; small-scale cross-bedding. **Lone Rock Formation, Tomah Member**–sandstone, quartzose, mica-bearing, light gray to yellow, very fine grained, thin-bedded; beds separated by laminae and partings of gray-green siltstone. **Lone Rock Formation, Birkmose Member**–sandstone, quartzose, glauconite-bearing, green, fine grained, commonly cross-bedded; includes burrowed beds and flat-pebble conglomerate.

€w — **Wonewoc Formation.** Sandstone. Consists of two recognizable units, from top to bottom: **Ironton Member**–sandstone, quartzose, white to brown with iron staining, medium to coarse grained, subrounded, poorly sorted, wavy-bedded, vertical burrows present; calcite-cemented; 5 to 18 m thick; individual beds 1 to 2 m thick with thin, intervening claystone beds. **Galesville Member**–sandstone, quartzose, white, fine to medium grained, rounded to subrounded, well sorted, thick-bedded, cross-bedded, poorly cemented; 5 to 18 m thick; individual bedding units 3 to 5 m thick.

€e — **Eau Claire Formation.** Sandstone, light brown, fine grained to silty, poorly sorted, medium- to thin-bedded, thick-bedded in places, abundant cross-bedding, flaggy-bedded; locally fossiliferous *(Cedaria sp.)*; some beds glauconitic; 30 to 46 m thick.

€m — **Mount Simon Formation.** Sandstone. Consists of four recognizable units, from top to bottom: **Sandstone**, quartzose, feldspar-bearing, white to light gray to pale brown, medium to coarse grained, angular, medium-bedded, locally lenticular-bedded; at least 52 m thick. **Sandstone**, quartzose, pale yellow orange to pale gray orange, very fine to fine grained, thin- to medium-bedded, angular, limonite-cemented; 38 m thick. **Shale**, gray to pale orange, silty; 18 m thick; known only from subsurface. **Sandstone**, quartzose, very pale orange, very fine to fine grained, subangular to subrounded; at least 35 m thick; known only from subsurface.

€u — **Sandstone,** undifferentiated.

Pks — **Shale and feldspathic to quartzose sandstone.** Red to buff, includes Solor Church Formation; known only from subsurface.

Pkv — **Chengwatana Volcanic Group.** Light to dark gray basalt flows, interflow breccia and tuff; individual flow units 5 to 30 m thick.

Pb — **Barron Quartzite.** Quartzite, pink to maroon to very light gray, medium grained, subrounded to rounded, moderately sorted, conglomeritic, medium-bedded; ripple marks, desiccation cracks, small-scale channels fillings; red argillite (pipestone) beds are present in places; at least 213 m thick. The formation at Flambeau Ridge is dominantly conglomerate.

Pbg — **Biotite granite.** Light gray or pink gray, medium grained, equigranular, weakly foliated, hypidiomorphic-granular texture modified in places by weak cataclasis (Lugerville); porphyritic hornblende granodiorite, coarse grained, with centimeter-sized microcline megacrysts (Radisson); 1,760 Ma-age group.

Pfg — **Flambeau Granite.** Granite to tonalite, light gray, medium grained; moderately strong foliation defined by biotite, hornblende, or both; all rock units contain concentrically zoned plagioclase; neutral to moderate gamma magnetic signature (-100 to 200 gamma) with gentle gradients; -40 mgal bouguer gravity signature.

Pms — **Metasedimentary rock.** Meta-argillite, metagraywacke, and graphitic garnet schist with minor interbedded metavolcanic rock; garnet- and staurolite-bearing assemblages; moderate to strong gamma magnetic signature (-200 to -100 gamma) with steep gradients; -20 to -40 mgal bouguer gravity signature.

Pif — **Meta-iron-formation.** Iron-formation and associated dolomite; strong, linear, magnetic anomalies with steep gradients.

Pfv — **Felsic metavolcanic rock.** Felsic and intermediate metavolcanic rock, bedded and massive metapyroclastic rock with subordinate mafic lavas; volcanogenic massive sulfide occurrences; greenschist metamorphic assemblages; neutral gamma magnetic signature (-500 to -300 gamma) and gentle gradients; -30 mgal bouguer gravity signature.

Pvs — **Volcanogenic metasedimentary rock.** Tuff, argillite, graywacke, volcanoclastic, and interbedded metavolcanic rock of greenschist to amphibolite metamorphic grade; neutral gamma magnetic signature (-200 to -400 gamma) with gentle gradients; -10 to -20 mgal bouguer gravity signature.

Pmv — **Mafic metavolcanic rock.** Mafic and intermediate metavolcanic rock with minor interbedded metatuff and metagraywacke of amphibolite metamorphic grade; moderate to strong gamma magnetic signature (-200 gamma) with steep gradients; -30 mgal bouguer gravity signature.

Pmg — **Mafic intrusive rock.** Mafic to ultramafic intrusions defined principally by magnetic signature, generally circular, +500 gamma anomalies. Where sampled, the rock consists of talc/serpentine schist and hornblende syenodiorite.

Pam — **Amphibolite.** Mafic, intermediate, and feldspathic amphibolite and associated biotite-hornblende-chlorite-epidote schist; elliptical +1000 gamma anomalies.

Pgn — **Granodiorite gneiss.** Medium- to coarse-grained, garnetiferous, biotite-muscovite, and banded and foliated granodiorite with ribbons and lenses of garnet-bearing pegmatite and quartz.

Ap — **Puritan Quartz Monzonite.** Pink gray, medium-grained, weakly foliated, equigranular, leucocratic quartz monzonite inferred from magnetic signature and continuity with units to north.

Agn — **Biotite gneiss.** Light gray to gray, medium to fine grained, biotite, quartzofeldspathic gneiss.