

E X P L A N A T I O N

Stratigraphic Units

Yd	Yp	Middle Proterozoic (Y)
intrusive contact		(upper precambrian)
Xms		Lower Proterozoic (X)
Xmf		(middle precambrian)
Xmg		
unconformity		
ARu	ARa	ARv
ARvf	ARmg	Archean

Description of rock units

- Yd** Diabase (lower Keweenaw). Fresh to weakly altered massive diabase. Occurs as dikes that have associated reversed magnetic polarity that can be traced on aeromagnetic maps.
- Yp** Peridotite (lower Keweenaw). Massive, reddish brown on weathered surface, moderately serpentinized plagioclase lherzolite. Contains significant amounts of Cu-Ni sulfides (see Klasner and others, 1977). These peridotite dikes have associated positive magnetic anomalies that can be traced on aeromagnetic maps.
- Xms** Michigamme Formation, metagraywacke unit. Metagraywacke, slate, argillite, and metaquartzite. In Silver Lake area, metagraywacke contains tectonically deformed concretions. In places, argillite lies directly on Archean rocks and is hematitic and relatively more phosphatic (may be equivalent to Xmf). Chemical analyses of this formation indicates that the average P₂O₅ content is around 0.1 to 0.2 percent.
- Xmf** Michigamme Formation, ferruginous argillite unit. Non magnetic, ferruginous, carbonaceous, argillite and metagraywacke that grades upward into Xms. In section 15, T49N, R28W, this unit contains phosphate-rich beds that contain as much as 15 percent P₂O₅ (see Cannon and Klasner, 1977).
- Xmg** Goodrich Quartzite. Basal arkose, conglomerate and quartzite. In places, arkose occurs as regolith on basement granite. Basal polymictic conglomerate has lithic fragments of Archean granite, clast of ferruginous argillite and chert, as well as phosphate-rich clasts of argillite. Conglomerate grades upward into quartzite which varies from black-dirty quartzite to clean-white orthoquartzite. In places, at the contact with basement, black to reddish chert or siliceous argillite, some of which is phosphatic, cements a regolith of granitic fragments.
- This unit is up to 50 feet thick near the center of section 19, T50N R28W.
- Xmd** Metamorphosed diabase and gabbroic dikes.
- ARu** Undifferentiated Archean basement rocks. Generally consists of tonalite and hornblende granodiorite gneiss with isolated patches of unfoliated granite.
- ARmg** Mafic-ultramafic complex of undetermined origin. Commonly massive, rarely faintly layered (see Cannon and Klasner, 1977).
- ARv** Massive to foliated intermediate to mafic meta-volcanic rocks. May contain zones of felsic volcanic rocks.
- In places contains pillows or ovoid structures suggestive of pillows.
- ARa** Coarse grained amphibolite and amphibolite gneiss. May be same as ARv.
- ARvf** Volcanic rock of felsic to intermediate composition. Commonly layered.

Map Symbols

- Drill hole
- ↗ Strike and dip of tectonic foliation
- ↕ Strike of vertical foliation
- ↗↘ Strike and dip of shear foliation
- ↗↘ Strike and dip of bedding or primary layering
- ↖ Plunge of long axis of tectonically deformed concretion
- Direction of top of pillow in volcanic rocks
- ↖ Direction of plunge of small fold
- Paleocurrent direction
- Outcrop or area of abundant outcrops
- Fault, dashed where uncertain. T indicates that location of fault based primarily on topography
- - - Geologic contact
- X Adit or test pit
- P Noteworthy occurrence of phosphatic rock
- ? Indicates areas of uncertainty or areas that have not yet been mapped
- ▨ Area where detailed geophysical and petrologic studies were done to investigate nature of peridotite intrusives (see Klasner and others, 1977)

Mapping along north edge of Baraga Basin by Brock. Other mapping by Klasner and Cannon.

See Clark and others (1975)

References

- Cannon, W.F., 1977, Map showing Precambrian geology in parts of Baraga, Dead River, and Clark Creek basins, Marquette and Baraga counties, Michigan. U.S. Geol. Survey open-file report 77-467.
- Cannon, W.F., and Klasner, J.S., 1977, Bedrock geologic map of the southern part of the Diorite and Champion 7 1/2 minute quadrangles, Marquette County, Michigan: U.S. Geol. Survey map, I-1050, 1:24,000 scale.
- Cannon, W.F., and Klasner, J.S., 1976, Phosphorite and other apatite-bearing sedimentary rocks in the Precambrian of northern Michigan: U.S. Geol. Survey Circular 746, 6 p.
- Care, J.E., and Gair, J.E., 1965, Aeromagnetic map of parts of Marquette, Dickinson, Baraga, Alger, and Schoolcraft Counties, Michigan and its geologic interpretation, U.S. Geol. Survey map, GP-467, 1:62,500 scale.
- Clark, L.D., Cannon, W.F., and Klasner, J.S., 1975, Bedrock geologic map of the Negaunee SW quadrangle, Marquette County, Michigan: U.S. Geol. Survey map GP-1226, 1:24,000 scale.
- Klasner, J.S., 1977, Bouguer gravity anomaly map, Baraga-Dead River Basins area, northern Michigan: U.S. Geol. Survey open-file report no. 77-746, 1:62,500 scale.
- Klasner, J.S., Snider, D.W., Cannon, W.F., Slack, J.F., 1977, The Yellow Dog peridotite and a possible buried igneous complex of lower Keweenaw age in the northern peninsula of Michigan: U.S. Geol. Survey open-file report no. 77-93.
- Trow, James, 1978, Preliminary geologic data, Diamond-drilling for geologic information in the middle Precambrian basins in the western portion of northern Michigan: five reports: DOE-1, DOE-3, DOE-4, DOE-5, DOE-7 for drill holes DL-1, DL-3, DL-4, DL-5, DL-7; Geologic Survey Division, Michigan Department of Natural Resources, Lansing, Michigan.
- _____, 1979, DOE-Bendix-Michigan Geological Survey diamond drilling for geologic information in Marquette and Iron counties, Michigan (abs.): 25th Ann. Institute on Lake Superior Geology, Duluth, Minn., p. 39.

NOTE:

This map shows bedrock geology where drill holes 1, 3, 4, 5, and 7 of the DOE-Bendix-Michigan Geological Survey drilling program are located (see Trow, 1978 and 1979).

