

# GEOLOGIC MAP OF THE WINFIELD QUADRANGLE, CARROLL AND FREDERICK COUNTIES, MARYLAND

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## EXPLANATION



**ALLUVIUM**

Gray-brown to light-brown, poorly sorted, coarse to fine sand, silt, and clay with sporadic lenses of subrounded quartz cobble gravel. In places includes chips and cobbles of local bedrock. May range up to as much as 10 feet in thickness. In smaller tributary streams, alluvium has not been mapped, but is present nonetheless as a thin veneer overlying channel bedrock.



**DIABASE**

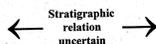
Dark greenish-gray to black, dense, fine-grained intrusive basalt with ophitic (diabasic) texture. Occurs in steeply dipping to vertical dikes which range from 1 foot to as much as 20 feet in thickness. Weathers to orange-red clayey soil with rounded residual cobbles and boulders.



**PLEASANT GROVE FORMATION**

Fine-grained, lustrous, green-gray to gray-green quartz-mica schist (quartz-muscovite-chlorite-epidote-plagioclase-magnetite ± biotite ± garnet) interlayered on a millimeter to decimeter scale with fine-grained, quartitic metagraywacke exhibiting differing percentages of the same minerals. The schist possesses a distinctive phacoidal parting referred to informally as 'oyster-shell structure', the result of an anastomosing mylonitic(?) foliation. In contrast, the more quartzofeldspathic lithologies commonly display a uniform planar parting. Stringers and pods of quartz, representing the limbs and hinges of sheared-out isoclinal folds, are pervasive throughout the formation. Age assignment of unit is that of the imposed tectonic fabric. Age of original rock material is uncertain.

## Rocks of the Linganore Nappe



**MARBURG FORMATION**

Silvery gray-tan, pale olive-tan, and waxy, pale bluish-green quartz-chlorite-muscovite phyllite with abundant thin, silty beds or laminae and thin zones of pale-reddish-purple phyllite. Weathers to gray-tan chips. Locally contains limonite pseudomorphs after pyrite in cubic crystals up to 1/2 inch in size. Includes thin to thick and massive beds of quartzite and also contains a few thin zones of poorly exposed, dark gray, calcareous muscovite phyllite. Thickness not known; top of formation is not present.

**mfq** — Lenses of light-gray to tan, medium-grained, thin- to medium-bedded, phyllitic quartzite and subordinate brown to black or dark greenish-gray, medium-grained, thick-bedded quartzite. Phyllitic quartzite is composed of rounded grains of quartz in a very fine-grained matrix of sericite and quartz. Thick-bedded quartzite is composed of rounded quartz grains tightly bound by fine-grained quartz and quartz cement. Thickness of individual lenses ranges up to 10 feet.



**GILLS FORMATION**

Dark to light silvery-gray, tan, and greenish-gray quartz-chlorite-muscovite phyllite, some with thin interbeds of white to pale green or tan quartz silt. Zones of bluish-green muscovite-chlorite phyllite and reddish-purple to pale purplish-gray muscovite phyllite are also prominent. Limonite pseudomorphs after pyrite in cubic crystals up to 1/2 inch in size occur locally within the gray and tan phyllites. Quartzites and quartitic phyllites occur sporadically within the assemblage but are more common in the eastern part of the quadrangle. Thickness of the Gills Group is unknown because the rocks have been thoroughly deformed by close folding and cleavage.

**gfq** — Layers and lenses of medium gray, gray-tan, and brown fine- to medium-grained quartzite and thin layers of interlayered phyllitic quartzite and phyllite. Quartzites are composed of rounded grains of quartz up to 1/16 inch in size and in places have been intensely permeated with *en echelon* veins of white quartz. Thickness ranges from approximately 3 feet to greater than 20 feet.

**gfl** — Two small lenses of white to light bluish-gray crystalline limestone, about 2 to 5 feet thick. Occur within the Gills Formation in the valley of Morgan Run near Bloom and Salem Bottom Roads.

**gst** — Steatite. No outcrop, but presence indicated by many float blocks of weathered, light gray to white talcose steatite with rusty limonitic vugs.



**SAMS CREEK FORMATION**

Dark bluish-green to olive-green metabasalt, sheared gray-green phyllitic metabasalt and lustrous green, purple, and gray phyllite. Metabasalt consists primarily of chlorite and epidote and has been strongly sheared. Magnetite crystals up to 1/8 inch in size are commonly present. In places contains epidotized knots up to 2 inches across. Green phyllite contains chlorite and muscovite. Purple and gray phyllites are composed primarily of sericite and muscovite with small amounts of magnetite and hematite and locally may contain thin calcite laminae. Unit has been thoroughly deformed by cleavage and small-scale folds and the thickness cannot be determined.

**scb** — Dominant lithology consists of massive albite-epidote-chlorite metabasalt, commonly fine-grained and massive with epidotized nodules. Lenticular bodies of coarse-grained metabasalt with relief diabasic texture occur within the Winfield fault zone of the Cranberry fault system.

**scp** — Dominant lithology is lustrous green, purple, and blebby, silvery-gray phyllite. Sheared chloritic metabasalt phyllite occurs as narrow silvers in the Winfield fault zone.



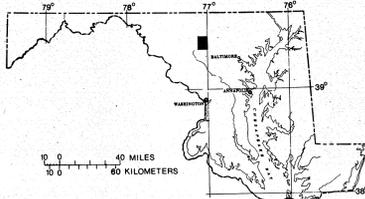
**WAKEFIELD MARBLE**

White to gray and reddish-purple calcite-dolomite marble. Appears to underlie the metabasalt and phyllite units of the Sams Creek Formation, but lenses and small pods of marble also occur within the Sams Creek Formation. Thickness ranges from less than 3 feet to greater than 100 feet.



**overthrust fault**

## QUADRANGLE LOCATION



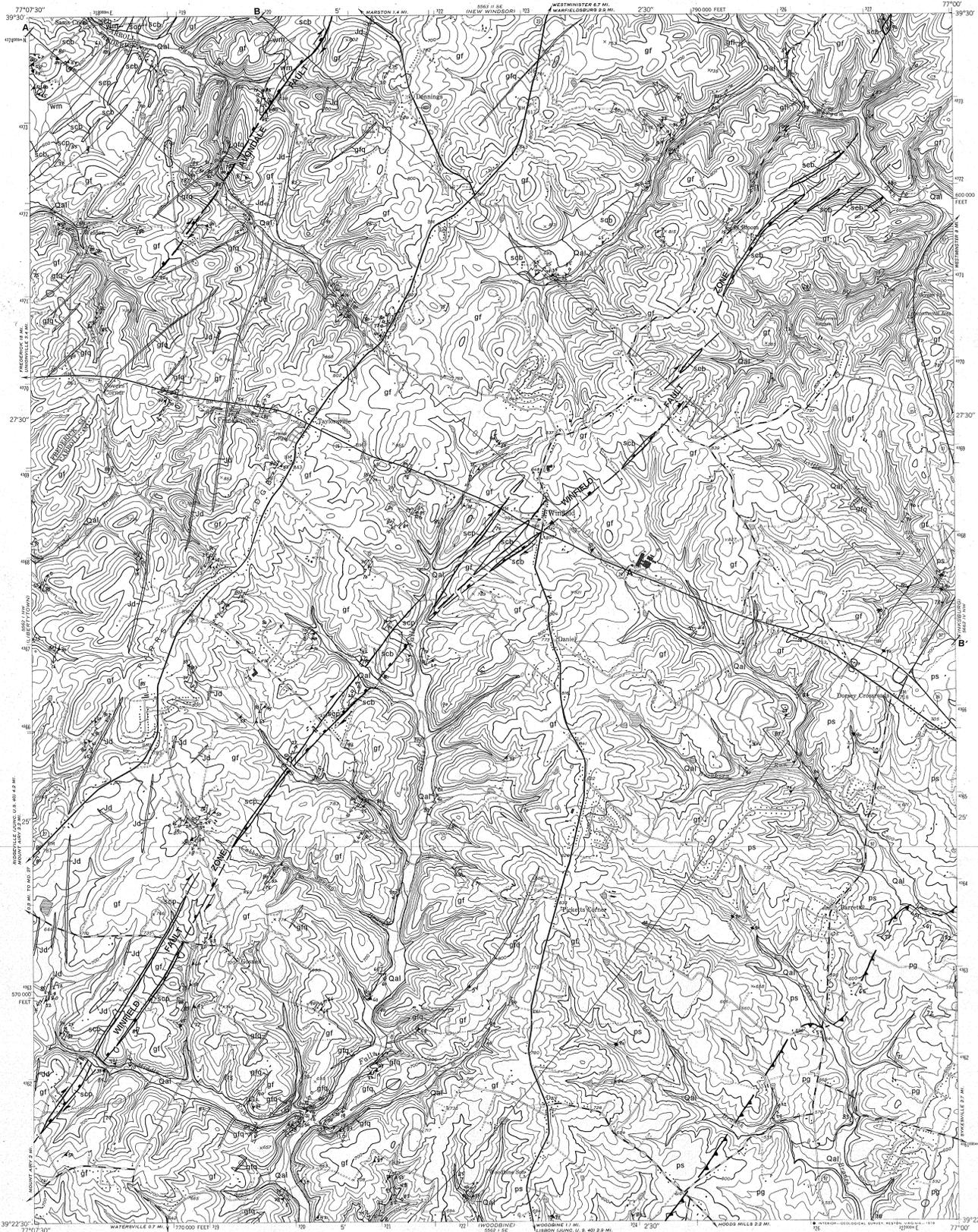
## GEOLOGIC SYMBOLS

- Geologic contact generally inferred or approximate
- Strike and dip of foliation
- Strike and dip of crenulation cleavage or slip cleavage
- Strike and dip of joints
- Plunge of minor fold axes
- Dextral rotation
- Sinistral rotation
- Overthrust fault teeth on upper plate
- Strike-slip fault arrows indicate relative motion bars on upthrown side

## GEOLOGIC CROSS SECTIONS

Horizontal scale same as map scale; no vertical exaggeration. Alluvial deposits not shown.

- Strike-slip movement toward viewer
- Strike-slip movement away from viewer



Base on U.S. Geological Survey 7.5-Minute Series (Topographic) Winfield Quadrangle, 1950 (photorevised, 1979). Field mapping done 1987, 1974-75, 1991, 1984. Additional data from field notes of W. P. Crowley.

SCALE 1:74,000  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODESIC VERTICAL DATUM OF 1929

Copies of map available from Maryland Geological Survey 2300 St. Paul Street Baltimore, MD 21218-5210

