

Description of Map Units

- Alluvium (Al)**
Well to poorly sorted stratified mixtures of unconsolidated clay, silt, sand, gravel, and cobbles underlie flood plains of nearly all rivers and tributaries. The channel of the tributary is commonly on bedrock with alluvium exposed along the banks. Thickness of alluvium is highly variable as a function of bedrock, topography, and land-use practices. Thickness estimated at as much as 15 feet (4 to 5 m) along the Monocacy River.
- Weathering residuum (Or)**
Mixture of moderate reddish brown soil and pebbles, cobbles, and blocks of light gray to white, angular, locally, euhedral quartz. Thickness ranges from a thin veneer to 10 feet (3.0 m).
- Terrace deposits (Tc)**
Reddish-brown to brown, sandy and clayey mixture of rounded pebbles to cobbles of sandstone, vein quartz and quartzite. Present along elevated low relief areas above the Monocacy River. Several separate levels of terrace deposits can be observed, but are not separately mapped here. Thickness ranges from a thin veneer to more than 10 feet (3 m).
- Diabase dikes (Di)**
Very thickly bedded, medium light gray, locally sandy, thrombotic and stromatolitic, massive diabase, with characteristic orange-brown weathered surface. Dikes vary from a wedge-edge to more than 150 feet (46 m) wide. While displayed as a solid unit on the map, the area mapped as diabase dikes actually represents an interfingering with the surrounding bedrock units).
- Grove Formation (Gf)**
Thick-bedded, dark gray, bioturbated, lime mudstone, and interbedded medium-bedded, dark gray, fine-grained lime mudstone with thin wavy-bedded, with tan, dolomitic partings. Top of this member not exposed in map area, but unit becomes thickly interbedded toward the top with medium dark gray, fine-grained lime mudstone with wavy beds. Thickness is 500 feet (152 m).
- Woodsboro Member (Wg)**
Thinly bedded, dark gray, bioturbated, lime mudstone, and interbedded medium-bedded, dark gray, fine-grained lime mudstone with thin wavy-bedded, with tan, dolomitic partings. Top of this member not exposed in map area, but unit becomes thickly interbedded toward the top with medium dark gray, fine-grained lime mudstone with wavy beds. Thickness is 500 feet (152 m).
- Fountain Rock Member (Fm)**
Medium light gray to medium gray, thick-bedded and cross-bedded, arenaceous limestone and sandy, dolomitic limestone with thin interbeds (1 ft or 0.3 m) of medium light gray, sandy, thrombotic dolomite. Thickness is approximately 150 to 200 feet (46 to 61 m).
- Ceresville Member (Ce)**
Medium light gray to medium gray, thick-bedded and cross-bedded, arenaceous limestone and sandy, dolomitic limestone with thin interbeds (1 ft or 0.3 m) of medium light gray, sandy, thrombotic dolomite. Thickness is approximately 150 to 200 feet (46 to 61 m).
- Frederick Formation (Fr)**
Thick-bedded to massive, medium to light gray limestone with interbedded, tan to medium gray dolomite. Three members are recognized and mapped in the Frederick Valley as outlined by Brezinski (2004).
- Lime Kiln Member (Lk)**
Interbedded, thinly laminated to thin bedded, dark gray, fine-grained limestone, calcareous shale, and medium bedded, fine-grained limestone near the base, becoming more thickly interbedded toward the top with medium dark gray, fine-grained limestone and wavy bedding and stromatolitic algal beds. Near the top, the member becomes interbedded with cross-bedded, sandy, medium light gray limestone. Thickness is 700 feet (213 m).
- Adamstown Member (Ad)**
Thinly interbedded, medium dark gray to dark gray, argillaceous, fine-grained limestone and dusky yellow to medium dark gray, silty dolomite. Limestone beds range from 0.1 to 2.0 inches (0.3 to 5.1 cm) in thickness. Several thin (6.0 to 30 feet or 1.8 to 9.1 m), dark greenish gray to greenish black, light olive brown weathering, silty, calcareous shale intervals are present throughout the member. The top of the member is mapped at the top of the stratigraphically highest polymictic breccia or sandstone interval. Thickness is approximately 1,200 feet (366 m) on the eastern flank, but is likely many times thicker on the western flank.
- Rocky Springs Station Member (Rss)**
Interbedded, dark gray, thin bedded, lime mudstone and black, dolomitic shale, massive, medium gray, polymictic breccias, medium gray, sandy limestone, and dark gray, flaggy lime mudstone. Breccia beds are thick (>30 feet or 9 m), massive and relatively continuous along strike on the western flank of the synclinalorium. On the eastern flank of the synclinalorium only thin (<30 feet or 0.9 m) breccias are present. Top of the member is mapped at the top of the stratigraphically highest polymictic breccia or sandstone interval. Thickness is approximately 1,200 feet (366 m) on the eastern flank, but is likely many times thicker on the western flank.
- Monocacy Member (Mo)**
Thickly interbedded, black, platy shale and rubby, dolomitic breccias, laminated lime mudstone, and black shale. The top of the member is marked by a laterally continuous black shale (Cm) that is more than 50 feet (15 m) thick. Thickness of this member is approximately 200 feet (61 m).
- Araby Formation (Ar)**
Thickly bedded, greenish black to grayish black, very fine grained to fine-grained, burrow-mottled, silty sandstone, interbedded with medium gray to grayish black, phyllitic shales 3.0 to 10 feet (0.9 to 3.0 m) thick. Top of the formation consists of grayish black phyllitic shale 45 to 60 feet (14 to 18 m) thick. The Araby Formation is present on the eastern side of the Frederick Valley Synclinalorium. Thickness of the Araby Formation is estimated at 600 feet (183 m).
- Urbana Formation (Ur)**
Moderate olive-brown to light olive-gray, calcareous metasilstone, metagraywacke, quartzite and meta-siltstone that are poorly sorted, graded-beds, cross-beds, and sparse ripple marks. Individually mapped quartzite intervals (Cuz) are light olive-gray and light brownish gray, coarse-grained, thin- to medium-bedded, cross-bedded, pitted, vuggy, friable, lenticular, and discontinuous.
- Sams Creek Formation (Czsc)**
Dark greenish gray to medium bluish gray, aphanitic to porphyritic, massive to schistose metabasalt composed of chlorite, epidote, quartz, altered plagioclase, actinolite, hornblende, and albite; igneous texture is locally preserved and pods of epidote are common; includes some metagranite composed of greenstone pebbles and cobbles, and local pillow structures and hyaloclastite.
- Marble (Czsm)**
Interbedded, light olive-gray to olive-gray, medium- to coarse-grained, medium-bedded, locally ferruginous, micaceous, silty sandstone and very fine grained, silty sandstone to sandy siltstone. Thickness is estimated at 300 feet (100 m).
- Tuffaceous phyllite (Cztp)**
Grayish red purple and bluish gray, variegated, vesicular phyllite with light gray streaks and blebs of tuffaceous phyllite.
- Muscovite phyllite (Czmp)**
Light bluish gray, dusky yellow, and moderate orange-pink, muscovite-chlorite phyllite containing albite porphyroblasts, quartz, and hematite dust. Contains minor metasilstone. Lithologically distinct from rocks of the Jmansville Phyllite and Marburg Formation.
- Hematite phyllite (Czhp)**
Bluish purple, hematite-rich phyllite. Resembles Jmansville Phyllite.
- Quartzite interbedded with phyllite (Czqip)**
Light gray quartzite interbedded with purple phyllite and slate, variegated, conglomeratic phyllite, and bluish gray, tuffaceous phyllite.
- Quartzite (Czq)**
Light gray to grayish green, medium-grained, thin-bedded to massive quartzite and minor calcareous sandstone. Contains detrital plagioclase, orthoclase, and polymictic quartz. Bedding is defined by concentrations of heavy minerals. Interbedded with phyllite, greenstone (Czgs), and metasilstone and metagraywacke (Czgw), that are light gray, medium- and coarse-grained quartzite, locally calcareous and cross-bedded.
- Metasilstone (Czscs)**
Metasilstone, phyllite, quartzite, and metagraywacke, undifferentiated. Light brown metasilstone interbedded with quartzite and calcareous metasilstone. Bedding can be recognized except where transposed in shear zones adjacent to faults. Muscovite phyllite containing albite porphyroblasts and elongate blebs of chlorite is interpreted to be a metaarf.
- Jmansville Phyllite (Czj)**
Dusky blue, grayish blue, very dusky red-purple, greenish gray to pale olive phyllite. Phyllonitic contains abundant pods and folded stringers of white vein quartz, and minor slate. Intensely folded and sheared with finely laminated beds seen only in slate. Phyllite consists mostly of muscovite and chlorite, but also contains pargonite and chloritoid. Has a lustrous sheen because of pargonite (determined by x-ray diffraction) and dark color because of abundant hematite dust.
- Quartzite (Czq)**
Yellowish gray, fine- to medium-grained, sericitic quartzite locally interbedded between phyllite and metasilstone.
- Marble (Czm)**
Light olive-gray, sandy limestone and dusky red, calcareous quartzite occurs within phyllite locally.
- Conglomeratic metagraywacke (Czcgw)**
Light gray and green, medium- to coarse-grained metagraywacke with white quartz pebbles, variegated phyllite, and green chloritic matrix.
- Chlorite phyllite (Czcp)**
Light olive-gray and greenish gray, chlorite phyllite and metasilstone.

References

- Brezinski, D.K., 2004. Stratigraphy of Frederick Valley and its relationship to karst development. Maryland Geological Survey Report of Investigations 75, 101 p.
- Reinhardt, J., 1974. Stratigraphy, Sedimentology and Cambro-Ordovician Paleogeography of the Frederick Valley, Maryland. Maryland Geological Survey Report of Investigations 23, 73 p.
- Southworth, S., Brezinski, D.K., Drake, A.A., Jr., Omdorff, R.C., Froelich, A.J., Reddy, J., and Daniels, D., 2003. Digital Geologic Map of the Frederick 30 by 60 Minute Quadrangle, Maryland, Virginia, and West Virginia. U.S. Geological Survey Open File Report 02-437, 1:100,000-scale, <http://pubs.usgs.gov/of/2002/of02-437/>.

Supplemental Information

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Explanation of Map Symbols
Geologic Symbols

- Contacts**
 - Geologic contact; approximately located dotted where concealed
 - Thrust fault
 - Overturned Thrust Fault
 - Fault; concealed
- Folds**
 - Minor anticline
 - Minor folds
 - Minor folds
 - Lineation at intersection of bedding and cleavage
- Miscellaneous Features**
 - Historic copper mine
 - Historic slate mine
- Planar Features**
 - Inclined bedding
 - Vertical bedding
 - Overturned bedding
 - Overturned bedding
 - Overturned bedding
 - Inclined cleavage
 - Vertical cleavage
 - Inclined joint
 - Inclined foliation in metamorphic rock
 - Inclined circulation cleavage
 - Vertical or near vertical foliation in metamorphic rock, strike shown

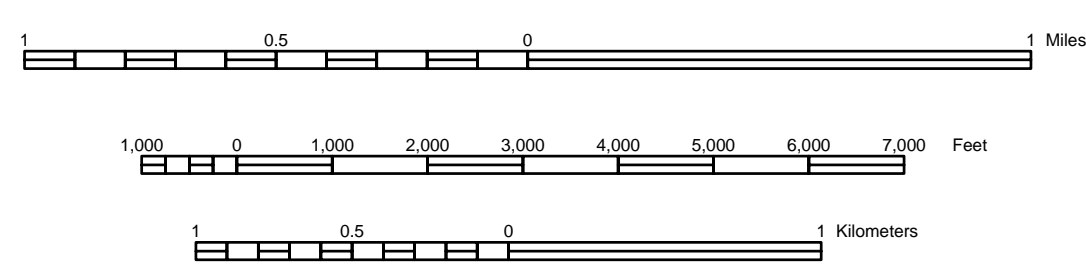
Base Map Symbols

- Transportation**
 - Primary route, class 1 (divided, lanes separated)
 - Primary route, class 1 (undivided)
 - Secondary route, class 2 (undivided)
 - Light duty road or street, class 3
 - Unimproved road or street, class 4
 - Railroad, railroad siding or spur
- Hydrography**
 - Stream
 - Water body (eg. lakes, ponds, rivers)
- Culture**
 - Incorporated city, village, town or borough
 - Small park boundary
 - Landing Strip, Airport, or Perimeter of Airport
 - Cemetery
 - Church
 - Airport
 - School

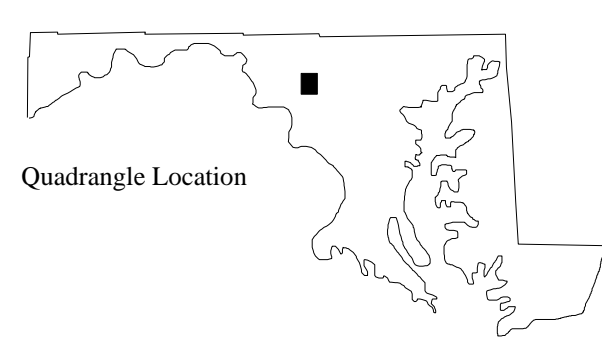
Geologic Map of the Walkersville Quadrangle, Frederick County, Maryland

By
David K. Brezinski, Scott Southworth,
and Jonathan Edwards, Jr.
2004

Scale 1:24,000



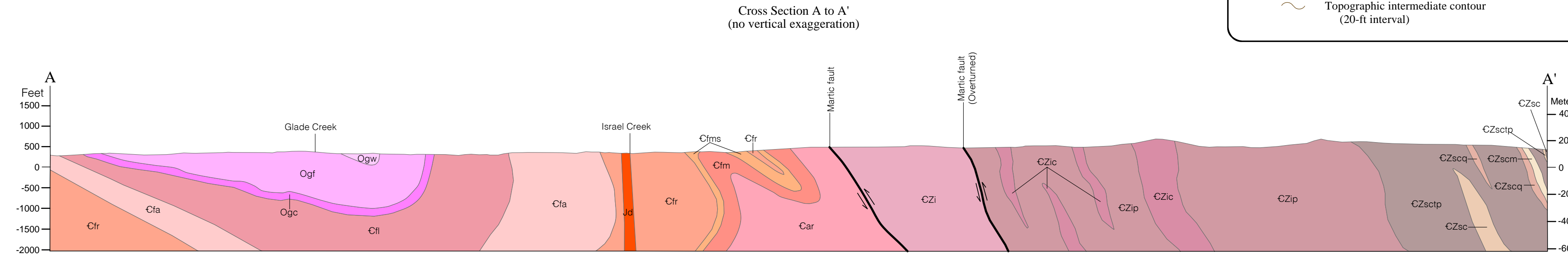
Contour Interval 20 Feet
National Geodetic Vertical Datum of 1929
(To convert elevations to the North American Vertical Datum of 1988, subtract 1 foot)
(To convert from feet to meters, multiply by 0.3048)



Adjoining 7.5' Quadrangle Names
Walkersville Quadrangle, shaded

1	2	3
4	5	6
7	8	

1. Calvert Furnace
2. Woodsboro
3. Union Bridge
4. Frederick
5. Libertytown
6. Backegastown
7. Urbana
8. Damascus



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