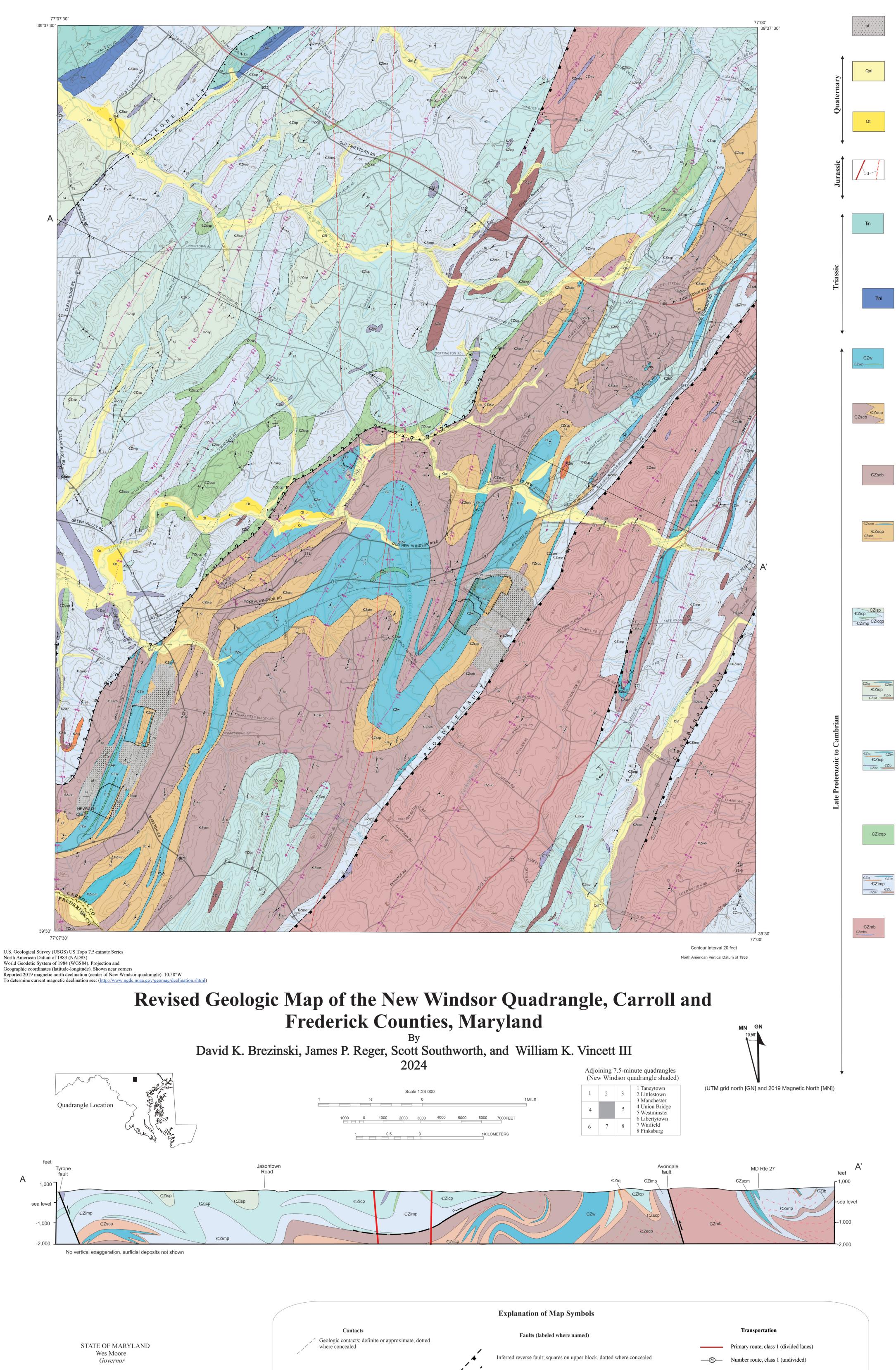
## **DESCRIPTION OF MAP UNITS**



Planar Features Light duty road or street, class 3 Inferred thrust fault; saw teeth point toward overriding block, (? where questionable) Inclined bedding/compositional banding dotted where concealed Vertical bedding/compositional banding Inferred normal fault; ball and bar on downthrown block, dotted where concealed Inclined cleavage Vertical cleavage Topography 78 78 Inclined crenulation cleavage Folds (arrows point toward dip direction) Topographic index contour Vertical crenulation cleavage (100- ft interval)  $\frac{1}{84}$  Inclined penetrative foliation Inferred axial trace of upright antiform, dotted where concealed Topographic intermediate contour (20-ft interval) Vertical foliation Inclined joint, strike and degree of dip shown Limits of quarrying operations Vertical joint, strike shown Inferred axial trace overturned antiform, dotted where concealed Abandoned mine pit **Linear Features** Inferred axial trace of upright synform, dotted where concealed Inclined lineation Intersection of bedding and cleavage Inferred axial trace of overturned synform, dotted where concealed Hydrography Cross section line (eg. lakes, ponds, rivers) Geochemical sampling location

Aruna Miller

DEPARTMENT OF NATURAL RESOURCES

Josh Kurtz Secretary

MARYLAND GEOLOGICAL SURVEY Stephen Van Ryswick

Director

Lieutenant Governor

Artificial fill/disturbed area

Areas of disturbance and spoil usuall surrounding quarrying operations. Consists of heterogeneous mixture of soil and rock debris. Also included are landfill sites, which contain trash, junk metal, and building demolition waste mixed with soil. Thickness ranges from 0 to 60 feet (20 meters).

Alluvium

Brown, grayish brown, light brown to reddish tan, poorly sorted, coarse to fine sand, silt, and clay with localized lenses of rounded cobbles. Locally, chips and angular cobbles of local bedrock are included. Thickness of this material ranges from a thin veneer on smaller tributaries up to 12 feet (4 meters) along Little Pipe Creek. In some of the smallest tributary streams, alluvium has not been shown, but it is present as a patchy veneer overlying a bedrock channel.

Reddish orange to light reddish brown, highly weathered, sandy, clayey, gravel-rich soil containing subrounded cobbles of quartz and pieces of local bedrock. Commonly covers low-relief areas elevated above, and adjacent to, the present flood plains. Most extensively developed along Big Pipe Creek and Little Pipe Creek. Thickness ranges from 0 to 10 feet (3 meters).

Jurassic dike

Massive, medium- to dark-gray, fine- to medium-grained diabase, weathering orange brown. Occurs in dikes typically weathering to isolated large, rounded, residual diabase boulders at the surface and within the soil. These dikes may be continuous and are shown as such. The age of the dikes in central Maryland and northern Virginia is early Jurassic

(Kunk et al., 1992).

**New Oxford Formation** Interbedded reddish brown to pinkish gray, very coarse-grained, pebbly, trough cross-bedded, argillaceous, arkosic sandstones, and silty, bioturbated mudstone and laminated siltstone. Some reddish gray to gray arkosic sandstones occur near the base of the formation. Sandstone intervals vary from 5 to 15 feet (1.5-5m) in thickness, while siltstones range in thickness from 1 to 6 feet (30 cm- 2 m). Shales and mudstones are intensely rooted and fractured by closely spaced mudcracks that can obscure primary bedding. The New Oxford Formation is best exposed along the bluffs of Big Pipe Creek and Little Pipe Creek, and also in channels of minor streams. Estimated thickness of the unit in the

New Windsor Quadrangle is about 1,000 feet (~300 meters).

Irishtown Member Interbedded massive, reddish brown, coarse-grained sandstone, and thick-bedded, grayish red conglomerate, interbedded with dark gray to reddish brown mudstone and siltstone, and gray shale. Clasts in the conglomerates are predominantly rounded to subrounded cobbles and pebbles of vein quartz and quartzite with maximum dimensions of 8 inches (20 cm) that are embedded in a reddish calcareous, mudstone matrix. Thickness of the member ranges from 0 to approximately 300 feet (100 meters) with an average of about 25 feet (8 meters).

White to light gray, massive to foliated, brecciated marble and tan dolomitic marble. Locally contains reddish purple, bluish gray and light gray marble. Zones of brecciation are interlayered with thin dark gray phyllite especially lower in the formation. Formation is best developed in the New Windsor, Wakefield, Jasontown, and Medford valleys. Locally contains discontinuous intervals of dark gray to dark greenish gray, tuffaceous phyllite and silvery gray phyllite

(EZwp) that are up to 75 feet thick. Thickness is estimated to range between 500 and 1500 feet (150 to 500 meters).

**Sams Creek Formation** 

Areas mapped as the Sams Creek Formation are segregated into two dominant lithologies, greenstone and phyllite. The main lithologies of the formation are a greenish gray to grayish green metabasalt and a greenish gray to light gray tuffaceous phyllite. The two subdivisions are equivalent to the greenstone (scgs) and chlorite phyllite (sccp) units of Fisher (1978) in the New Windsor Quadrangle, the Sams Creek basalt (scb) and Sams Creek phyllite (scp) of Edwards (1986), and the metabasalt (EZsc) and phyllite (EZscp) of Reger and Edwards (2006) in the Union Bridge Quadrangle.

Metabasalt

Olive green to dark greenish gray, locally medium bluish gray, banded, thick-bedded to massive metabasalt. Basalt intervals can be massive, flow-banded, epidote-rich, and alternate with layers of vesicular basalt and gray phyllite containing flattened lapilli. Some beds are sheared and schistose, contain dark purple to black phyllite, and are

**Tuffaceous chlorite phyllite** 

Light greenish gray to light gray, locally variegated, dull to lustrous, tuffaceous phyllite with interbeds and lenses of dark greenish gray, sheared, phyllitic metabasalt. Greenish gray phyllite is locally interbedded with purplish gray phyllite that is composed of sericite and muscovite, and contains small amounts of magnetite and hematite or thin limestone beds, laminae, or clasts. These greenish gray phyllites also contain layers of vesicles, flattened lapilli, filled amygdules, and brecciated reddish marble (EZscm) locally present. Unit is deformed and foliation and small-scale folds preclude estimation of primary thickness.

**Ijamsville Formation** 

The Ijamsville Formation is composed of an intergrading assemblage of phyllite lithologies ranging in color from purple, bluish gray, greenish gray, silvery, to variegated (Jonas and Stose 1938a, b, 1946). Some intervals are comprised of granular, fragmental, or vesicular phyllite. Each mapped unit is arbitrarily defined based upon the dominate phyllite type present, but actually represents intergrading array of most other phyllite units. Included subunits include beds of tan to buff, banded to tuffaceous porous, medium- to coarse-grained sandstone (EZiq), white, tan, and reddish purple, massive to brecciated dolomitic marble (EZim), green gray, banded to massive, foliated, vesicular metabasalt (EZib), and medium gray, ribbony, limestone equated to the Silver Run Limestone (EZisr).

Dark bluish gray to light gray phyllite that parts as planar chips of phyllite and resembles slate. Weathers silvery gray to tan. This unit includes a preponderance of the outcrops of the Silver Run Limestone (EZisr). Stratification in these limestone areas is 0.5- 4 inches (1- 10 cm) thick and highly contorted. Mapped phyllite and limestone areas correspond, in part, to the Silver Run Limestone (srl) of Fisher (1978), the Marburg Formation, Silver Run Limestone (mfb and mfs) of Edwards (1986), the Sams Creek, Silver Run Limestone and muscovite-phyllite slate (EZscsr and EZscps) of Reger and Edwards (2006). Thickness is undeterminable.

Chlorite phyllite

Dull to lustrous, dusky greenish gray, bluish gray, and pale green, banded to granular, tuffaceous, muscovite phyllite and silty tuffaceous phyllite. Locally, phyllite contains light gray bands and blebs representing crushed lapilli. Contains rare and localized dark gray, ribbony limestone beds (EZisr) interpreted to be equivalent to the Silver Run Limestone of Edwards (1986). Thin, traceable intervals of medium-grained to massive, banded, tuffaceous sandstone and reddish to cream-colored brecciated marble are present. This unit corresponds to the Ijamsville chlorite phyllite of Brezinski et al. (2004) and much of the Urbana Formation of Edwards (1986). Thickness is unknown, but assumed to be greater than 1000 feet.

Chlorite quartz phyllite -CZicqp

Light gray to grayish-green micaceous, quartz-chlorite-phyllite characterized by pinstripe laminations 2-4 mm thick that are subparallel to cleavage. Unit is resistant to weathering, and creates low ridges and sandy soils. Corresponds to the Ijamsville mica-chlorite-quartz phyllite (ijqp) of Fisher (1978) and the Sams Creek mica-quartz chlorite phyllite of Reger et al. (2004).

€Zimp €Zim

Silvery light gray, tan-weathering muscovite-chlorite phyllite. Contains disseminated minute limonite cubes that are pseudomorphs after pyrite. Unit corresponds to the Ijamsville muscovite phyllite (ijmp) of Fisher (1978), the Sam Creek muscovite phyllite of Reger et al. (2004), and to the Gillis Formation (gf) of Edwards (1986).

**Marburg Formation** 

Muscovite phyllite

Greenish gray, silvery gray, silty, sandy phyllite that weathers to irregular chips and pieces in overlying soil. Locally, intervals of dark grayish blue to purple phyllite are interlayered and folded with the typical greenish gray phyllite as are light gray, quartz-rich, sandy layers. Prominent sandy intervals (EZmbs) vary from greenish gray, sandy, sheared and foliated phyllite to coherent slabs of dark gray coarse-grained metagraywacke, or blocks of massive light gray to tan metaquartzite. Sandy intervals are similar to EZicqp, but lack visible fragments of lapilli, compositional banding and pinstripe foliation. Hematite is commonly present as small (0.1mm) to large (3.0 cm) cubes that are pseudomorphs after pyrite. Unit corresponds to the Wissahickon (wap) of Fisher (1978), the Marburg Formation and Prettyboy Schist of Reger et al. (2004), and the EZmbs of Southworth et al. (2008).

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