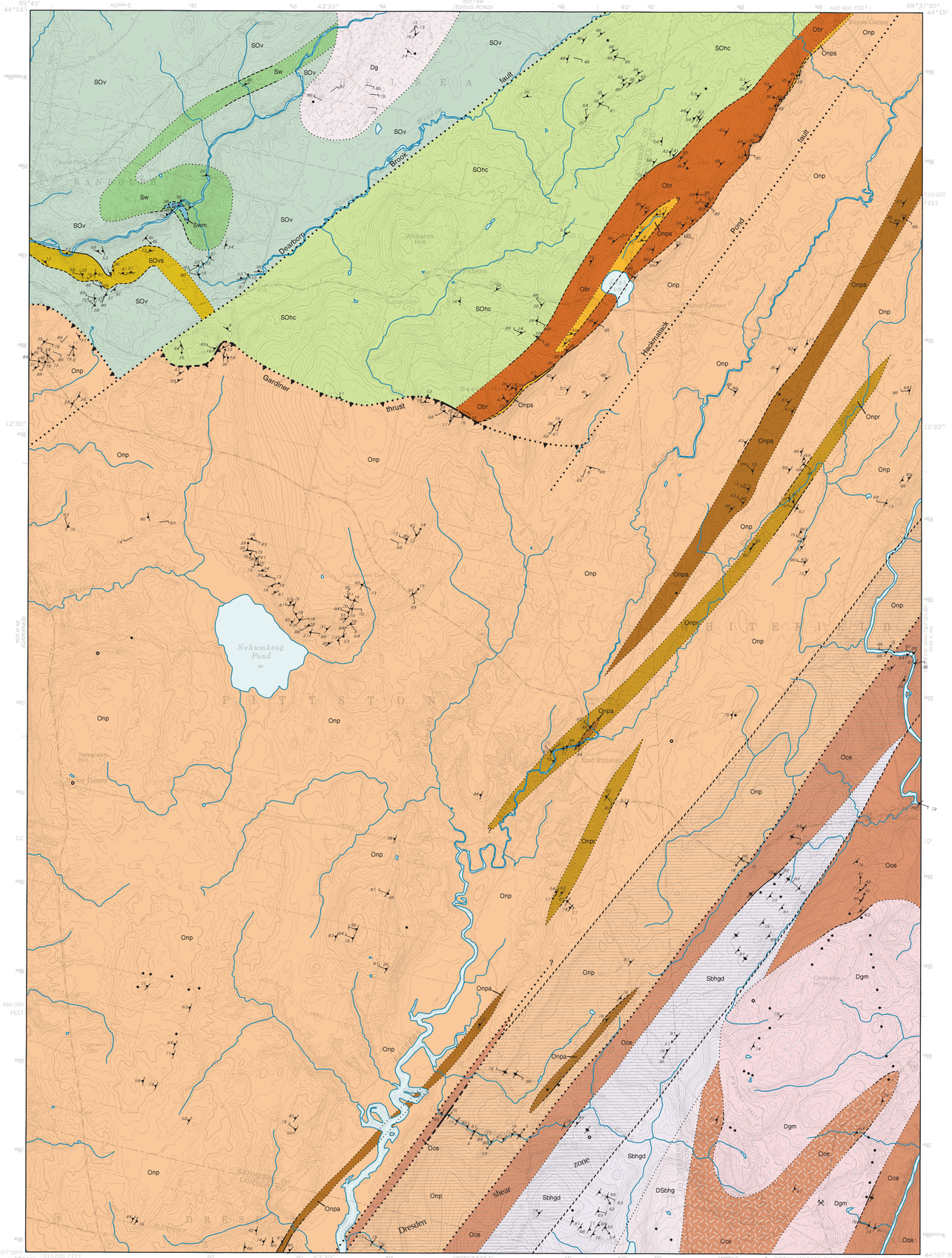

EXPLANATION OF UNITS

INTRUSIVE ROCKS

Devonian (?)

Dg — **Biotite granite.** Gray-weathering, light gray, coarse-grained, massive non-foliated biotite ± garnet ± tourmaline granite. Biotite is less than 10% and garnet is less than 1% of the rock.

Dgm — **Muscovite granite.** Light gray to white, medium-grained to pegmatitic, non-foliated to moderately foliated muscovite ± garnet ± biotite granite. This rock makes up large, mapped bodies; it also occurs as abundant small, unmapped bodies intruding the Cape Elizabeth Formation within the patterned area shown on the map as migmatite.

Blinn Hill pluton.

Devonian-Silurian(?)

DSbhg — **Foliated muscovite-biotite granite.** Light gray, medium-grained, moderately to strongly foliated biotite-muscovite ± garnet ± tourmaline granite.

Silurian

Sbhgd — **Biotite granodiorite.** *Outside the Dresden shear zone:* Medium gray, medium-grained to coarse-grained, foliated, porphyritic biotite ± hornblende granodiorite. Variably foliated pegmatite dikes and sills are locally abundant. *Within the Dresden shear zone:* Medium to dark gray, porphyroclastic biotite granodiorite containing a steeply dipping mylonitic foliation. Thin sections show a thoroughly recrystallized, very fine-grained matrix of quartz, biotite, and epidote, which anastomoses around strongly aligned feldspar porphyroclasts. Both mesoscopic and microscopic kinematic indicators show a dextral sense of shear.

STRATIFIED ROCKS

Vassalboro Group

Silurian

Sw — **Waterville Formation.** Medium-grained to coarse-grained muscovite-biotite-quartz ± garnet ± sillimanite schist. Garnet is commonly 2 mm, idiomorphic, and pale lavender. Quartz veinlets parallel to the foliation are common.

Swm — **Impure marble.** Tan to brownish-weathering, green to white, thin-bedded to medium-bedded, calc-silicate granofels, biotite-bearing calc-silicate granofels, and impure marble.

Silurian-Ordovician

SOhc — **Hutchins Corner Formation.** Gray, brown, or tan-weathering, thin-bedded to medium-bedded, medium-grained to fine-grained granofels, including biotite-quartz-feldspar granofels, biotite quartzite, and green and white calc-silicate granofels ± calcite.

SOv — **Vassalboro Group, undifferentiated.** Gray, brown, or tan-weathering, thin-bedded to medium-bedded, medium-grained to fine-grained granofels, including biotite-quartz-feldspar granofels, biotite quartzite, and green and white calc-silicate granofels ± calcite. Stratigraphic position uncertain. Possibly equivalent to either the Hutchins Corner Formation or the Mayflower Hill Formation.

SOvs — **Rusty-weathering feldspathic quartzite and schist.** Thoroughly rusty-weathering, friable, fine-grained, and equigranular. The feldspathic quartzite is white on a fresh surface and may contain trace amounts of biotite. In all observed outcrops, the schist is completely oxidized by weathering. It may contain some muscovite but any original biotite is oxidized. The rusty weathering stain comes presumably from iron in sulfide minerals in the fresh rock, but little to no original sulfide minerals remain.

Ordovician

Falmouth-Brunswick sequence

Obr — **Beaver Ridge Formation.** Moderately to very rusty-weathering rocks including medium-grained to coarse-grained muscovite-graphite ± pyrite schist, and friable, white quartzite with locally graphitic muscovite-rich parting surfaces. At one locality, rusty-weathering impure calc-silicate marble is present also.

Onp — **Nehumkeag Pond Formation.** *Outside the Dresden shear zone:* The predominant rock type is light gray, medium-grained to coarse-grained, non-rusty to slightly rusty-weathering, plagioclase-quartz-biotite gneiss. Subordinate rock types include amphibolite; amphibole-rich gneiss with hornblende, cummingtonite, and/or anthophyllite; and quartz-plagioclase-biotite ± garnet ± sillimanite schist and gneiss. Some exposures contain calc-silicate gneiss and rusty-weathering schist. Variably deformed muscovite-biotite ± garnet pegmatite dikes, sills, and boudins are locally abundant. *Within the Dresden shear zone:* Medium to light gray, fine-grained, thinly laminated (<0.5 cm), protomylonitic to mylonitic quartz-feldspar-biotite gneiss. Locally, subordinate amounts of highly sheared hornblende-bearing gneiss are present.

Onps — **Schist.** Medium-grained muscovite-biotite ± garnet schist. This unit is present discontinuously near the contact between the Nehumkeag Pond and Beaver Ridge Formations.

Onpr — **Rusty-weathering schist and gneiss.** Medium to light gray, medium-grained to coarse-grained, moderately to deeply rusty-weathering, sulfidic, quartz-muscovite-biotite ± sillimanite ± garnet schist and gneiss. In some places, this rock is interlayered with non-rusty-weathering rocks such as felsic gneiss or dark gray hornblende-bearing gneiss.

Onpa — **Amphibolite.** *Outside the Dresden shear zone:* Dark gray, fine-grained to medium-grained amphibolite and amphibole-rich gneiss, ± biotite ± garnet. Discontinuous thin layers less than 2 cm thick of greenish gray, fine-grained to medium-grained calc-silicate rock are locally abundant. Occasional zones of rusty-weathering and non-rusty-weathering felsic gneiss a few meters thick may be present within this unit. *Within the Dresden shear zone:* Dark gray, fine-grained, thinly laminated, mylonitic amphibole-rich gneiss, locally garnet-bearing. Subordinate amounts of mylonitic felsic gneiss may be present.

--------- *relationship uncertain* ---------

Casco Bay Group

Oce — **Cape Elizabeth Formation.** *Outside the Dresden shear zone:* Light gray to medium gray, medium-grained, quartz-plagioclase-muscovite-biotite ± garnet ± sillimanite schist interlayered with light gray, fine-grained, quartz-plagioclase micaceous granofels. Layering is commonly between 2 and 12 cm thick. Variably deformed, muscovite-biotite ± garnet pegmatite dikes, sills, and boudins are locally abundant. In the migmatitic region south and east of the Blinn Hill pluton, shown on the map by an overprint pattern, intrusive rocks generally comprise more than half of the outcrops. *Within the Dresden shear zone:* Medium to dark gray, fine-grained protomylonite to mylonite characterized by porphyroclasts of feldspar and muscovite set in a dark gray, fine-grained to aphanitic matrix. The muscovite is typically smeared out on moderately rusty-weathering, steeply dipping, mylonitic foliation surfaces. These rocks are interpreted to be more highly sheared equivalents of Cape Elizabeth Formation rocks outside the shear zone.

EXPLANATION OF PATTERNS

Strongly deformed rocks of the Dresden shear zone. See unit descriptions for lithologic descriptions of rocks in the shear zone.

Migmatitic rocks. In the region south and east of the Blinn Hill pluton, rocks of the Cape Elizabeth Formation are intruded by variable amounts of non-foliated to weakly foliated, muscovite ± biotite ± garnet granite and pegmatite. Generally, intrusive igneous rocks comprise greater than 50% of the outcrops in this region. The igneous rocks of the migmatite are thought to be related to the neighboring plutons of muscovite granite.

Bedrock Geology of the East Pittston Quadrangle, Maine

Bedrock geologic mapping by
Timothy W. Grover and David P. West, Jr.

Digital cartography by
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Open-File No. 14-30
2014
This map supersedes Open-File Map 92-56.

TRUE NORTH

SCALE 1 : 24,000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

SOURCES OF INFORMATION

Field mapping in the northern half of the quadrangle by T. Grover, 2009. Field mapping in the southern half of the quadrangle by D. West, 2010 and 2014.

Topographic base from U.S. Geological Survey East Pittston quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols. Magnetic declination 17° west of North.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

EXPLANATION OF SYMBOLS

Note: Structural symbols are drawn parallel to strike or trend of measured structural feature. Barb or tick indicates direction of dip, if known. Annotation gives dip or plunge angle. For most planar features, symbol is centered at observation point; for joints, observation point is at end of strike line opposite dip tick. For linear features, tail of symbol is at observation point. Multiple measurements at a site are represented by combined symbols.

- Outcrop of mapped unit.
- Abundant or large float blocks presumed to represent underlying bedrock.
- Outcrop of pegmatite.
- 20 — Metamorphic foliation (inclined, vertical).
- 20 — Mineral lineation on foliation surface (plunging).
- 20 — Fold axis (plunging).
- 20 — Prominent joint or joint set (inclined, vertical).
- Inactive quarry.

EXPLANATION OF LINES

- Intrusive or stratigraphic contact, possibly modified by shear deformation (well located, approximately located, poorly located).
- Shear zone boundary. A gradational boundary between highly deformed and mylonitic rocks of the Dresden shear zone, and the adjacent rocks with regional foliation. See unit descriptions for lithologic differences across this boundary.
- Inferred high-angle fault (well located, approximately located, poorly located).
- Thrust fault. Interpreted from truncation of map units, difference in foliation orientation, and low dip of foliation. Teeth on inferred upper plate (well located, approximately located, poorly located).

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GEOLOGIC TIME SCALE

Geologic Age		Absolute Age*
Cenozoic Era		0-66
Mesozoic Era	Cretaceous Period	66-145
	Jurassic Period	145-201
	Triassic Period	201-252
Paleozoic Era	Permian Period	252-299
	Carboniferous Period	299-359
	Devonian Period	359-419
	Silurian Period	419-444
	Ordovician Period	4443-485
	Cambrian Period	485-541
Precambrian time		Older than 541

* In millions of years before present. (Walker, J.D., Geissman, J.W., Bowring, S.A., and Babcock, L.E., compilers, 2012, Geologic Time Scale v. 4.0: Geological Society of America, doi: 10.1130/2012.CTS004R3C.)