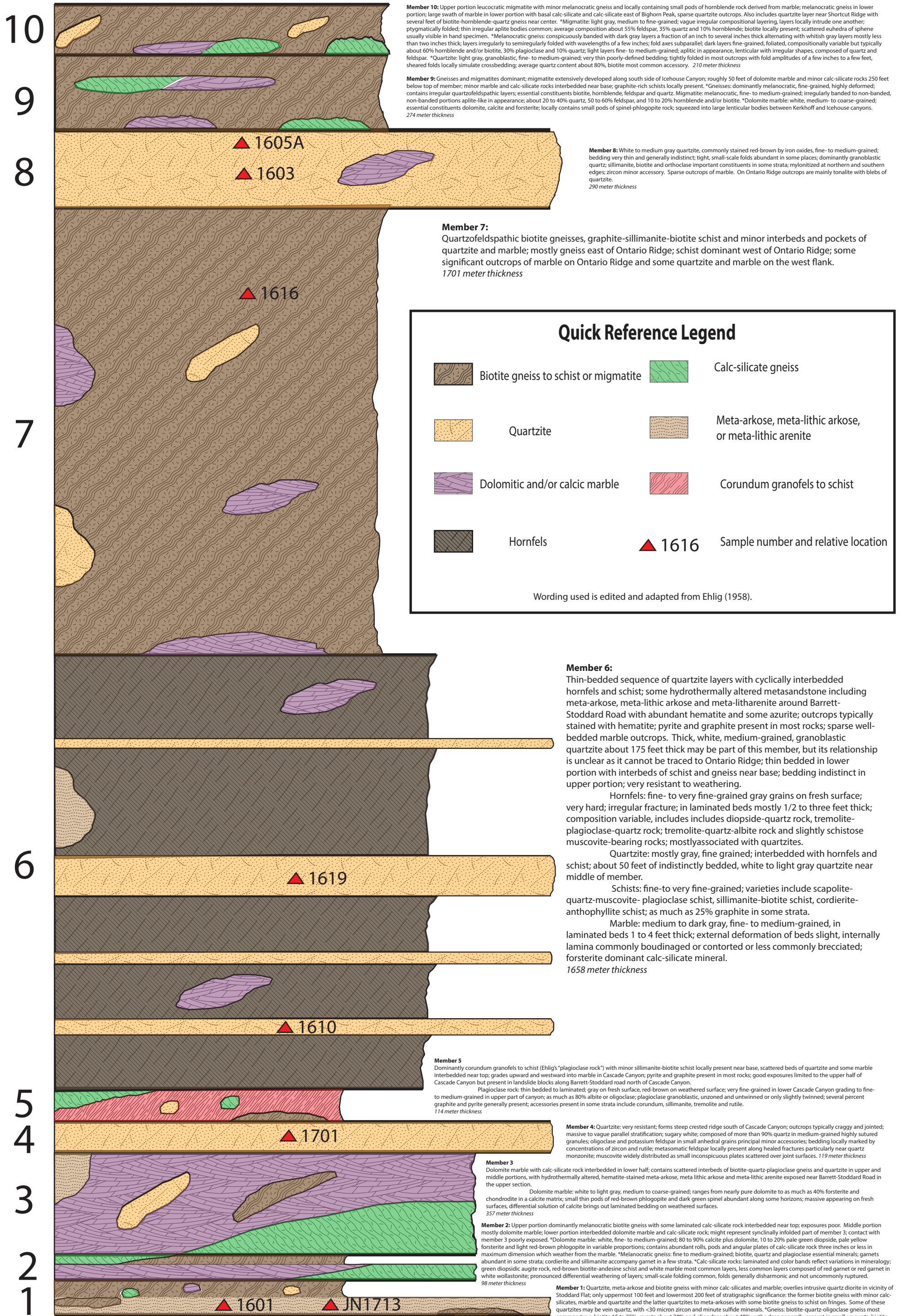


Pseudo-stratigraphic Column of Ontario Ridge Metasediments



Member 10: Upper portion leucocratic migmatite with minor melanocratic gneiss and locally containing small pods of hornblende rock derived from marble; melanocratic gneiss in lower portion; large swath of marble in lower portion with basal calc-silicate and calc-silicate east of Bighorn Peak, sparse quartzite outcrops. Also includes quartzite layer near Shortcut Ridge with several feet of biotite-hornblende-quartz gneiss near center. *Migmatite: light gray, medium to fine-grained; vague irregular compositional layering, layers locally intrude one another; psymatically folded; thin irregular aplite bodies common; average composition about 55% feldspar, 35% quartz and 10% hornblende; biotite locally present; scattered euhedra of sphene usually visible in hand specimen. *Melanocratic gneiss: conspicuously banded with dark gray layers a fraction of an inch to several inches thick alternating with whitish gray layers mostly less than two inches thick; layers irregularly to semiregularly folded with wavelengths of a few inches; fold axes subparallel; dark layers fine-grained, foliated, compositionally variable but typically about 60% hornblende and/or biotite, 30% plagioclase and 10% quartz; light layers fine- to medium-grained; aplitic in appearance, lenticular with irregular shapes, composed of quartz and feldspar. *Quartzite: light gray, granoblastic, fine- to medium-grained; very thin poorly-defined bedding; tightly folded in most outcrops with fold amplitudes of a few inches to a few feet, sheared folds locally simulate crossbedding; average quartz content about 80%, biotite most common accessory. 210 meter thickness

Member 9: Gneisses and migmatites dominant; migmatite extensively developed along south side of Icehouse Canyon; roughly 50 feet of dolomite marble and minor calc-silicate rocks 250 feet below top of member; minor marble and calc-silicate rocks interbedded near base; graphite-rich schists locally present. *Gneisses: dominantly melanocratic, fine-grained, highly deformed; contains irregular quartzofeldspathic layers; essential constituents biotite, hornblende, feldspar and quartz. Migmatite: melanocratic, fine- to medium-grained; irregularly banded to non-banded, non-banded portions aplitic-like in appearance; about 20 to 40% quartz, 50 to 60% feldspar, and 10 to 20% hornblende and/or biotite. *Dolomite marble: white, medium- to coarse-grained; essential constituents dolomite, calcite and forsterite; locally contains small pods of spinel-phlogopite rock; squeezed into large lenticular bodies between Kerkhoff and Icehouse canyons. 274 meter thickness

Member 8: White to medium gray quartzite, commonly stained red-brown by iron oxides, fine- to medium-grained; bedding very thin and generally indistinct; light, small-scale folds abundant in some places; dominantly granoblastic quartz; sillimanite, biotite and orthoclase important constituents in some strata; mylonitized at northern and southern edges; zircon minor accessory. Sparse outcrops of marble. On Ontario Ridge outcrops are mainly tonalite with blebs of quartzite. 290 meter thickness

Member 7: Quartzofeldspathic biotite gneisses, graphite-sillimanite-biotite schist and minor interbeds and pockets of quartzite and marble; mostly gneiss east of Ontario Ridge; schist dominant west of Ontario Ridge; some significant outcrops of marble on Ontario Ridge and some quartzite and marble on the west flank. 1701 meter thickness

Quick Reference Legend

<p> Biotite gneiss to schist or migmatite</p> <p> Quartzite</p> <p> Dolomitic and/or calcic marble</p> <p> Hornfels</p>	<p> Calc-silicate gneiss</p> <p> Meta-arkose, meta-lithic arkose, or meta-lithic arenite</p> <p> Corundum granofels to schist</p> <p> 1616 Sample number and relative location</p>
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Wording used is edited and adapted from Ehlig (1958).

Member 6: Thin-bedded sequence of quartzite layers with cyclically interbedded hornfels and schist; some hydrothermally altered metasandstone including meta-arkose, meta-lithic arkose and meta-litharenite around Barrett-Stoddard Road with abundant hematite and some azurite; outcrops typically stained with hematite; pyrite and graphite present in most rocks; sparse well-bedded marble outcrops. Thick, white, medium-grained, granoblastic quartzite about 175 feet thick may be part of this member, but its relationship is unclear as it cannot be traced to Ontario Ridge; thin bedded in lower portion with interbeds of schist and gneiss near base; bedding indistinct in upper portion; very resistant to weathering.

Hornfels: fine- to very fine-grained gray grains on fresh surface; very hard; irregular fracture; in laminated beds mostly 1/2 to three feet thick; composition variable, includes includes diopside-quartz rock, tremolite-plagioclase-quartz rock; tremolite-quartz-albite rock and slightly schistose muscovite-bearing rocks; mostly associated with quartzites.

Quartzite: mostly gray, fine grained; interbedded with hornfels and schist; about 50 feet of indistinctly bedded, white to light gray quartzite near middle of member.

Schists: fine- to very fine-grained; varieties include scapolite-quartz-muscovite- plagioclase schist, sillimanite-biotite schist, cordierite-anthophyllite schist; as much as 25% graphite in some strata.

Marble: medium to dark gray, fine- to medium-grained, in laminated beds 1 to 4 feet thick; external deformation of beds slight, internally lamina commonly boudinaged or contorted or less commonly brecciated; forsterite dominant calc-silicate mineral. 1658 meter thickness

Member 5: Dominantly corundum granofels to schist (Ehlig's "plagioclase rock") with minor sillimanite-biotite schist locally present near base, scattered beds of quartzite and some marble interbedded near top; grades upward and westward into marble in Cascade Canyon; pyrite and graphite present in most rocks; good exposures limited to the upper half of Cascade Canyon but present in landslide blocks along Barrett-Stoddard road north of Cascade Canyon.

Plagioclase rock: thin bedded to laminated; gray on fresh surface, red-brown on weathered surface; very fine-grained in lower Cascade Canyon grading to fine- to medium-grained in upper part of canyon; as much as 80% albite or oligoclase; plagioclase granoblastic, unzoned and untwinned or only slightly twinned; several percent graphite and pyrite generally present; accessories present in some strata include corundum, sillimanite, tremolite and rutile. 114 meter thickness

Member 4: Quartzite: very resistant; forms steep crested ridge south of Cascade Canyon; outcrops typically craggy and jointed; massive to vague parallel stratification; sugary white; composed of more than 90% quartz in medium-grained highly sutured granules; oligoclase and potassium feldspar in small anhedral grains principal minor accessories; bedding locally marked by concentrations of zircon and rutile; metasomatic feldspar locally present along healed fractures particularly near quartz monzonite; muscovite widely distributed as small inconspicuous plates scattered over joint surfaces. 119 meter thickness

Member 3: Dolomite marble with calc-silicate rock interbedded in lower half; contains scattered interbeds of biotite-quartz-plagioclase gneiss and quartzite in upper and middle portions, with hydrothermally altered, hematite-stained meta-arkose, meta lithic arkose and meta-lithic arenite exposed near Barrett-Stoddard Road in the upper section.

Dolomite marble: white to light gray, medium to coarse-grained; ranges from nearly pure dolomite to as much as 40% forsterite and chondrodite in a calcite matrix; small thin pods of red-brown phlogopite and dark green spinel abundant along some horizons; massive appearing on fresh surfaces, differential solution of calcite brings out laminated bedding on weathered surfaces. 357 meter thickness

Member 2: Upper portion dominantly melanocratic biotite gneiss with some laminated calc-silicate rock interbedded near top; exposures poor. Middle portion mostly dolomite marble; lower portion interbedded dolomite marble and calc-silicate rock; might represent synclinically folded part of member 3; contact with member 3 poorly exposed. *Dolomite marble: white, fine- to medium-grained; 80 to 90% calcite plus dolomite, 10 to 20% pale green diopside, pale yellow forsterite and light red-brown phlogopite in variable proportions; contains abundant rolls, pods and angular plates of calc-silicate rock three inches or less in maximum dimension which weather from the marble. *Melanocratic gneiss: fine to medium-grained; biotite, quartz and plagioclase essential minerals; garnets abundant in some strata; cordierite and sillimanite accompany garnet in a few strata. *Calc-silicate rocks: laminated and color bands reflect variations in mineralogy; green diopside augite rock, red-brown biotite-andesine schist and white marble most common layers, less common layers composed of red garnet or red garnet in white wollastonite; pronounced differential weathering of layers; small-scale folding common, folds generally disharmonic and not uncommonly ruptured. 98 meter thickness

Member 1: Quartzite, meta-arkose and biotite gneiss with minor calc-silicates and marble; overlies intrusive quartz diorite in vicinity of Stoddard Flat; only uppermost 100 feet and lowermost 200 feet of stratigraphic significance: the former biotite gneiss with minor calc-silicates, marble and quartzite and the latter quartzites to meta-arkoses with some biotite gneiss to schist on fringes. Some of these quartzites may be vein quartz, with <30 micron zircon and minute sulfide minerals. *Gneiss: biotite-quartz-oligoclase gneiss most common type; biotite 15 to 25%, quartz about 30% and oligoclase about 40%; orthoclase generally present in small amounts; biotite concentrated in schistose lamellae separating layers and lenses of medium-grained granoblastic quartz and feldspar; small scale folding common; grades into biotite-hornblende-quartz-plagioclase migmatite near quartz diorite contact; light and dark constituents only vaguely segregated and foliation very irregular in migmatites. Laminated calc-silicate rocks and a variety of plagioclase, quartz, amphibole, biotite garnet and sillimanite-bearing gneisses form uppermost 100 feet of member; individual units laterally continuous for at least 1 mile east of Stoddard Canyon Truck Trail; garnet and sillimanite associated with biotite-rich strata; garnets vary greatly in size from one strata to the next; garnets as much as 5 cm. in diameter; small pods of bedded calc-silicate rock locally isolated in quartzofeldspathic gneiss. 131 meter thickness

Total thickness of San Antonio Canyon metasediments
4952 meters = 16245 feet = 3.08 miles