Minerals from the Soapstone Quarry, Richmond, NH

Tom Mortimer

I suspect many collectors may view the Richmond Soapstone Quarry as a "One Trick Pony": a cordierite locality, or perhaps a two species site, cordierite and rutile. However, a diligent collector may find 18 to 20 mineral species in the vicinity of this long abandoned quarry. This photo-documentary article illustrates the Richmond quarry species that I have added to my collection over a period of thirty years.

The Richmond soapstone quarry may be accessed from Sprague Rd. off Rt. 19, about 0.6 miles west of Richmond Four Corners. Follow Sprague Rd. (dirt) south about 1.0 miles where it fords a brook beyond a stone structure home. Beavers frequently dam this brook and it has been impassable beyond this point on a number of occasions, (it was passable in Sept. 2013). Crossing this brook, proceed 0.5 miles to a fork. Go left (south), crossing a wooden bridge over Spraque Brook. Continue up hill about 0.3 miles and park. Look for opening in stone wall on left (east) side of road. The soapstone quarry is about 1000 feet into the woods to the east. There is no obvious path from the stonewall opening to the quarry. The GPS coordinates of quarry are: 42 deg 44.233 min N, 72 deg 17.553 min W. A robust four-wheel-drive vehicle is strongly recommended beyond the first brook crossing.

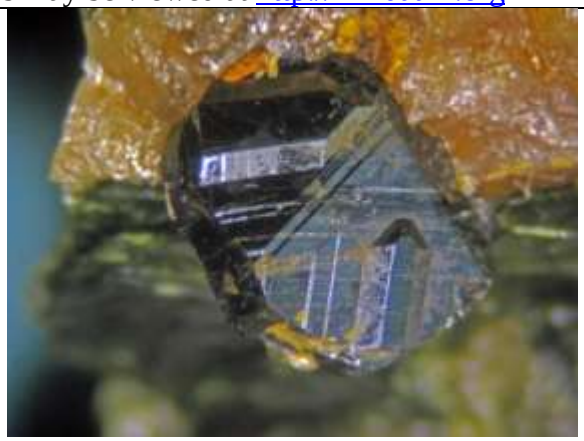
The quarry is a water-filled pit about the size of a cellar hole for a four bedroom colonial. The soapstone quarried here has been analyzed to be a magnesiohornblende amphibole. This soapstone is different from the talc-based rock quarried from other New Hampshire soapstone localities, (e.g. Francestown, Canterbury, Weare). The much sought-after cordierite crystals have been found at the contact between the amphibole rock and quartz dikes that traverse the area. The cordierite crystals are fully embedded in the quartz, which must be carefully broken away to expose a nice euhedral crystal. Stubby, prismatic, rutile crystals to 2 cm are also found in this contact environment.

Cordierite easily alters to a mica variety "pinite." Many cordierite specimens recovered from the Richmond locality are at least partially altered to pinite. The gem, pale blue, iolite variety of cordierite is uncommonly seen as embedded masses to perhaps 1 cm across.

The Richmond amphibolite-cordierite rock unit may be followed from the quarry along a ridge for about a mile south to the Massachusetts border. A small outcrop about 0.2 miles south of the quarry was investigated by Mike Undercofler and myself in 1993. It yielded several fine rutile specimens as well as a number of TN cordierite crystals and clinochlore specimens. The spot was named the "Green Balloon" locality, for the balloon found hanging from a nearby tree. (GPS: 42 deg 44.061 min N, 72 deg 17.551 min W)

Like most old, long-collected, localities, it is increasingly difficult to find good specimens here, especially on a single day trip. Good specimens certainly remain buried here. A multi-day, multi-collector, effort would reap rewards. Two specimens from a September, 2013 visit are shown below. Large image photos of several dozen Richmond specimens may be viewed at http://mindatnh.org

1.3 cm brown, terminated, cordierite crystal in quartz matrix.



6 mm rutile "button" crystal with secondary crystal growth on pyramid termination faces.

Photos of Richmond Soapstone Quarry area mineral species, alphabetical order.

Apatite in Quartz.
Pale green apatite crystals to 1.3 cm in quartz matrix. This apatite fluoresces pale yellow. Although Phillip Morrill's *New Hampshire Mines and Mineral Localities* booklet does list apatite for the Richmond Soapstone Quarry, I have not seen apatite from there previous to 2013. Not outstanding as a New Hampshire apatite specimen, but an interesting locality occurrence. I did not recognize the apatite until after I brought the specimen home, so perhaps more diligent collecting in this milky quartz rock-matrix would produce better examples.

Annite (A biotite mica) EDS verified
3.4 cm hexagonal Biotite Mica crystal cleavage. From Pegmatite near the soapstone quarry, Richmond, NH.
Field collected June, 1977.

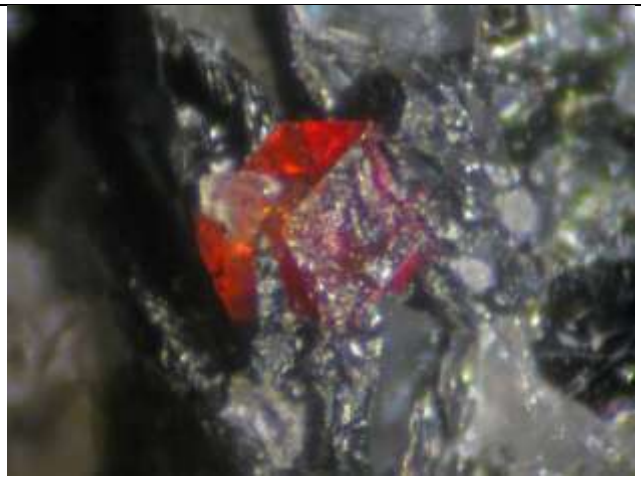
Cordierite
2.8 cm terminated, prismatic, cordierite crystal. The Richmond cordierite crystals are found on the borders of quartz dikes that cut through the amphibolite soapstone.

Cordierite
3 cm specimen with hexagonal prismatic cordierite crystals in quartz. The Cordierite from this soapstone quarry is one of New Hampshire's "world class" species

Chalcopyrite
10 cm specimen with thin crust of chalcopyrite on magnesiohornblende

Clinochlore - EDS verified
1.3 cm specimen of hexagonal clinochlore crystals. For individual clinochlore crystals, these Richmond, NH ones stand up quite well, even on a world-wide stage. Individual crystals approaching 2 cm have been found.

Dravite – EDS verified
5 cm crude complete crystal.
From Pegmatite near the soapstone quarry, Richmond, NH. Collected in 1977 with Mike Undercofler. I was never able to relocate this dike dispite several attempts. The EDS analysis shows Mg > Fe therefore this is the magnesium dominant tourmaline, dravite.



Garnet group
0.6 mm red garnet in biotite (annite?) mica.
Overall matrix is quartz. Given that this is a very magnesium rich environment, perhaps this could be the magnesium garnet, pyrope. Analysis is in process.

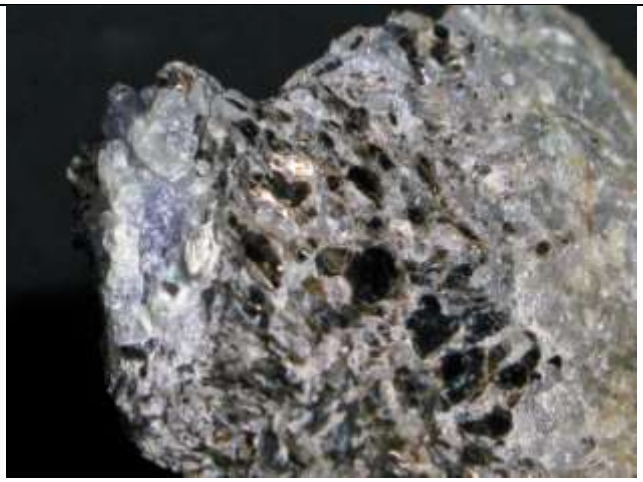
Gedrite - EDS verified
4 cm specimen of bladed dark-brown gedrite crystals in quartz. For many years, I thought this mineral was anthophyllite, also reported from the Richmond Soapstone Quarry. All specimens in my collection that I thought were anthophyllite are actually gedrite.
This specimen was collected in 2004.

Ilmenite – Visual identification
4 mm ilmenite crystal in quartz.
Rutile and clinochlore are also present on this TN sized specimen.
This specimen came from the "Green Balloon Prospect" area.

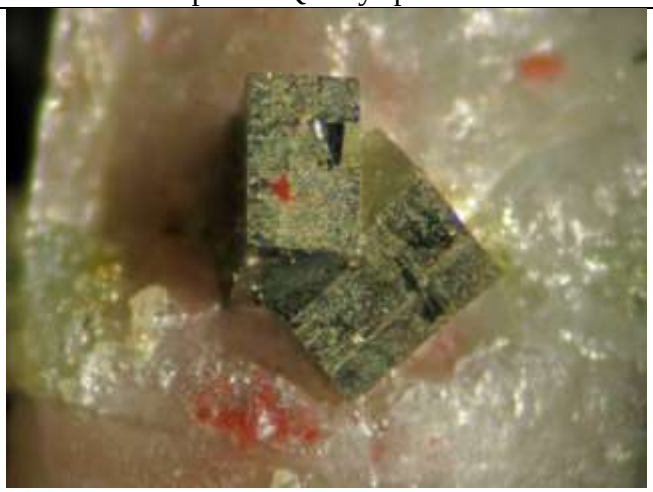
Kyanite - EDS verified
7 x 5 cm specimen of milky kyanite blades in quartz. From vicinity of Soapstone Quarry, Richmond, NH

Magnesiohornblende - EDS verified
4 cm specimen of solid massive magnesiohornblende.
This mineral is the "soapstone" at the Richmond Soapstone Quarry. Micro red rutile needles are present in this specimen.

Magnetite in quartz
Magnetite identification by strong magnetic attraction. Magnetite has not appeared on previous Richmond Soapstone Quarry species lists.



Phlogopite - EDS verified
1.8 cm field of view. Dark-brown phlogopite mica with blue gem iolite on left.

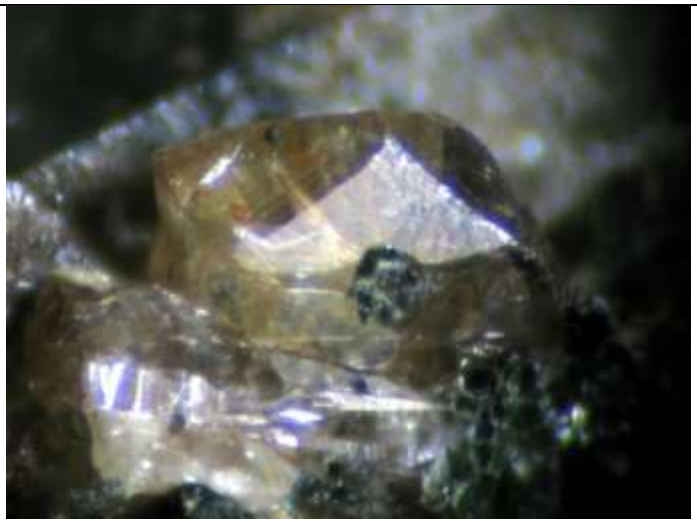


Pyrite
Pair of inter-grown 1 mm pyrite crystals on calcite.

Rutile
2 cm specimen with 1 cm stubby prismatic rutile crystal.
This specimen was collected from a quartz cordierite knob known to local collectors as the "Green Balloon Prospect", (a few hundred yards south of the soapstone quarry), named for the balloon found hanging in a nearby tree.

Rutile
4 mm pyramid termination rutile crystal in feldspar matrix. This specimen also came from the "Green Balloon Prospect".

Talc
4 cm specimen with pale green talc interspersed within blades of magnesiohornblende.
During a 2013 visit to the Richmond soapstone locality I desired to collect some additional samples of the magnesiohornblende that is the majority component of the quarried soapstone. Microscope examination of these samples revealed that this rock also contains a minor talc component as a soft pale green to gray-white mineral interspersed with the darker blades of magnesiohornblende.
A 1987 article in the Journal of Petrology by Schumacher and Robenson, "Mineral Chemistry and Metasomatic Growth of Aluminous Enclaves in Gedrite-Cordierite-Gneiss from Southwestern New Hampshire, USA" confirms the presence of talc at this Richmond locality.



Titanite
0.8 mm pale yellow titanite crystal