The oldest rocks in the quadrangle are Mesoproterozoic and are part of the New Jersey Highlands. They are deformed into a regional hinge that trends southeast-northwest. Its fold axis is to the east in the Pompton Plains quadrangle (Volkert, 2010). The axis of the broad, upright regional anticline, and the Watchung Syncline that extends through the southeast corner of the area. In the quadrangle straddles the boundary between the Highlands and Piedmont Physiographic Provinces, with the latter to the west.

Among the oldest Mesoproterozoic rocks are those of the Losee Suite, interpreted as a sequence of meta-sedimentary rocks. Variscan deformation and metamorphism have produced gneissic to migmatitic foliation. The youngest Mesoproterozoic rocks are small, irregular bodies of granite pegmatite that are undeformed and are of Middle Proterozoic age.

Zeolite facies metamorphism of the Losee Suite is suggested by the presence of illites and smectites in the metasedimentary rocks. The metasedimentary rocks are biotite-plagioclase amphibolites and gneisses, with surface exposures of metabasalt and metagraywacke. 

The pegmatitic rocks of the quadrangle are essentially undeformed, and the absence of foliation and cleavage is indicative of a post-tectonic intrusive event. Dikes are as much as 40 ft. wide and a mile or more long. The pegmatites are in places cross-cut the regional structure of the Losee Suite and are a possible source for the pegmatitic mineralization in the area. Metamorphic conditions of the Pegmatitic Suite may be similar to those of the Losee Suite.

One of the most significant rocks in the quadrangle is the New Jersey Slate Member of the Lake Hopatcong Intrusive Suite. It is a prominent feature in the area and is a potential source for slate production. Its thickness is about 1,640 ft. Levels of natural radioactivity range from 13 to 15 (mean=14)

**DESCRIPTION OF MAP UNITS**

- **Lake Hopatcong Intrusive Suite**
  - Graywacke
  - Slate
  - Siltstone
  - Sandstone
  - Shale

- **Pegmatitic Suite**
  - Granite
  - Pegmatite

- **Losee Suite**
  - Amphibolite
  - Gneiss

- **Other Rocks**
  - Metabasalt
  - Metagraywacke

**SELECTED REFERENCES**

- Olsen, P.W., 1980, Mesoproterozoic Rocks of the New Jersey Highlands: Growth, Content, and for its use as a flux during the roasting of magnetite from local mines.

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