Bedding averages N.89°E. (Fig. 1). Nearly all of the beds dip northwest at 7° to 58° and average 33°. Several hundred feet in thickness, they are closely spaced, typically 2 feet or less, and common-occurring Mesoproterozoic rocks on the hanging wall. It merges with the Flemington fault at the southeast. The South Branch Raritan River constitutes the dominant drainage in the map southeast. The South Branch Raritan River is a significant waterway in the area.

The geologic interpretations presented here supersede those shown on the bedrock geologic maps of New Jersey. The bedrock geologic maps are used as a reference for understanding the geological setting and spatial distribution of different rock types in the region.

Accurate measurements of the strike and dip of joints and foliation are crucial for understanding the deformational fabric of rocks. These measurements provide insights into the tectonic processes that shaped the region. For instance, joints formed near faults are more closely spaced, typically 2 feet or less, and common-occurring Mesoproterozoic rocks on the hanging wall. Joints and foliation in Proterozoic rocks show consistent trends with a strike of N.76°E. and a dip of 33°. Mylonitic foliation in Proterozoic rocks exhibits a strike of N.82°E. and a dip of 34°. Cleavage in Paleozoic rocks strikes N.78°E. and dips 56°.

The printed text also highlights the presence of a syncline in the map area, indicating a region of upward (uplift) and downward (subduction) folds in the geology. The syncline is a structural feature where the beds are folded into a U-shaped bend, with one limb rising (southeast) and the other falling (northwest). The syncline is bounded by fault lines, with the Tewksbury fault extending through the central and northeastern part of the area. This fault strikes northeast and separates Mesoproterozoic rocks on both the footwall and hanging wall.

On the east limbs of the fold, dip gently (~30°) to moderately (~55°). Small, parasitic folds present in the region further complicate the geological structure. Structural data such as fault movement direction, bearing and plunge of mineral lineation, and strike and dip of structures are integral for understanding the deformational structures and spatial distribution of different rock types.

The printed text also mentions the occurrence of hematite in the Cambrian Leithsville Formation north of Califon. Hematite was mined from the Cambrian Leithsville Formation in this area. The Cambrian Leithsville Formation is a sedimentary rock sequence that preserves a record of the Late Cambrian Paleozoic deposits. The formation is composed of grey to dark-gray sandstone, siltstone, and mudstone, with argillaceous siltstone and shale interbeds. Erosive base and beds fine upward through red sandstone and mudstone. Sandstone and siltstone are typically gray, while mudstone is dark gray. A erosive base and beds fine upward through red sandstone and mudstone. Sandstone and siltstone are typically gray, while mudstone is dark gray.

The Paleozoic Leithsville Formation in the northern part of the map area consists of a grayish-orange to light- to dark-gray, grayish-red, light-greenish-gray- or paleo-weathering, pale pinkish-white to light greenish-gray, medium-grained, compositionally layered and quartzofeldspathic and feldspathic sandstone. Paleosol zones occur throughout but are more abundant in lower sequence. Lower contact is erosive and shows a transition from sandstone to mudstone. The top is typically clayey and fine sandstone. The formation is characterized by sandstone, siltstone, and mudstone interbeds, with occasional conglomerate and sandstone beds. The formation is more than 300 feet thick and is significant for its preservation of Late Cambrian to Early Ordovician sedimentary deposits.

The Preakness Basalt is a volcanic unit that intrudes the Mesoproterozoic crystalline rocks. The Preakness Basalt is typically medium-light- to very light-gray, medium- to coarse-grained, moderately foliated, and consists of a compositionally layered sillimanite, graphite, magnetite, and pyrrhotite. Graphite and pyrrhotite are present in rusty to brownish colors. The Preakness Basalt is significant for its preservation of volcanic and intrusive rocks in the region.