














**SURFICIAL GEOLOGY OF THE SANDY HOOK QUADRANGLE
MONMOUTH COUNTY, NEW JERSEY**





By
Scott D. Stanford
2000

DESCRIPTION OF MAP UNITS

Age of unit indicated in parentheses. For units spanning more than one period, principal age is listed first. Order of map units in list does not necessarily indicate chronologic sequence.

-  **ARTIFICIAL FILL**—Sand, silt, clay, gravel; brown, gray, yellowish brown; may include demolition debris (concrete, brick, asphalt, glass) and trash. As much as 20 feet thick. In road and railroad embankments and made land. Many small areas of fill in urban areas are not shown.
-  **Qal** **ALLUVIUM (Holocene and late Pleistocene)**—Sand, silt, clay, peat; yellowish brown, dark brown, gray, and pebble gravel. Abundant organic matter. Sand is chiefly quartz, with some glauconite and mica. Gravel is quartz and quartzite with minor ironstone. As much as 15 feet thick. Deposited in floodplains, channels, and ground-water seepage areas.
-  **Qs** **SWAMP AND MARSH DEPOSITS (Holocene and late Pleistocene)**—Freshwater peat and organic silt, sand, and clay; dark brown to black. As much as 10 feet thick.
-  **Qcal** **COLLUVIUM AND ALLUVIUM (Holocene and late Pleistocene)**—Interbedded alluvium and colluvium in headwater valleys. As much as 15 feet thick.
-  **Qbs** **BEACH AND NEARSHORE MARINE SAND (Holocene)**—Sand, very pale brown to light gray; and pebble gravel. As much as 150 feet thick but generally less than 20 feet thick. Silt and clay, dark gray to black, as much as 10 feet thick, overlie the sand and gravel in Sandy Hook Bay. Deposited during Holocene sea-level rise. Underlain in places by estuarine deposits.
-  **Qmm** **ESTUARINE DEPOSITS (Holocene)**—Salt-marsh peat, organic silt and clay; dark brown to black; sand and minor pebble gravel; very pale brown, white, gray. As much as 100 feet thick. Deposited during Holocene sea-level rise. Commonly underlain by lower terrace deposits.
-  **Qtl** **LOWER TERRACE DEPOSITS (late Pleistocene)**—Sand and minor silt; yellow, yellowish brown, reddish yellow, and pebble gravel. Sand is chiefly quartz with some glauconite and mica. Gravel is quartz and quartzite with minor ironstone. As much as 50 feet thick. Form stream terraces with surfaces 5 to 20 feet above the modern floodplain.
-  **Qcl** **LOWER COLLUVIUM (late Pleistocene)**—Sand, silt, minor clay; yellow, yellowish brown, reddish yellow, light gray; some quartz and ironstone pebbles. As much as 20 feet thick, generally less than 10 feet thick. Forms aprons graded to lower terraces or the modern floodplain.
-  **Qcm2** **CAPE MAY FORMATION, UNIT 2 (late Pleistocene)**—Sand, minor silt and clay; very pale brown, yellow, white, olive yellow; and pebble gravel. Sand is chiefly quartz with minor glauconite and mica; gravel is quartz and quartzite. As much as 50 feet thick. Forms a shore-facing terrace with surface elevation between 15 and 40 feet. Deposited in beach and estuarine settings during the Sangamon sea-level highstand between 120,000 and 130,000 years ago.
-  **Qtu** **UPPER TERRACE DEPOSITS (middle Pleistocene)**—Sand, minor silt, yellow, reddish yellow; and pebble gravel. Sand is chiefly quartz; glauconite and mica are generally less abundant than in the lower terrace deposits and alluvium. Gravel is quartz, quartzite, and minor ironstone. As much as 20 feet thick. Form terraces with surfaces 20 to 50 feet above the modern floodplain.
-  **Qcu** **UPPER COLLUVIUM (middle Pleistocene)**—Sand, silt, minor clay; pale brown, yellow, reddish yellow; some quartz, quartzite and ironstone pebbles. As much as 20 feet thick. Forms aprons graded to upper terraces.
-  **TOg** **UPLAND GRAVEL, LOWER PHASE (late Pliocene-middle Pleistocene)**—Sand, minor silt; yellow to reddish yellow; and pebble gravel. Sand is chiefly quartz with minor glauconite and mica; gravel is quartz and quartzite. As much as 10 feet thick. Caps lower uplands and interfluvies.
-  **Qwcp** **WEATHERED COASTAL PLAIN FORMATIONS**—Exposed sand and clay of Coastal Plain bedrock formations. May be overlain by thin, patchy alluvium and colluvium. Quartz and ironstone pebbles left from erosion of surficial deposits may be present on the surface and in the upper several feet of the formation.

DESCRIPTION OF MAP SYMBOLS

-  **Contact**—Contacts of alluvium, beach deposits, and estuarine deposits are well-defined by landforms and are drawn from 1:12,000-scale aerial stereophotos. Contacts of other units are approximately located based on both landforms and field observation points.
-  **Material observed in hand-auger hole, exposure, or excavation.**
-  **Well or boring**—Upper number is identifier, lower number is thickness of surficial material. Identifiers of the form 'xxxx' are N. J. Department of Environmental Protection well permit numbers (all carry the prefix '29-'). Identifiers of the form 'xx-xxx' are N. J. Atlas Sheet grid locations of entries in the N. J. Geological Survey permanent note collection. Identifiers of the form 'Bxx' are engineering test borings on file at the N. J. Geological Survey. Identifiers of the form 'Gxx' are from Gaswirth, S. B., 1999, The late Pleistocene to Holocene glacial history of Raritan Bay, New Jersey. M. S. thesis, Rutgers University, New Brunswick, N. J., 157 p. Identifiers of the form '25-xxx' are from Gronberg, J.M., Birkelo, B.A., and Pucco, A.A., 1989, Selected borehole geophysical logs and drillers' logs, northern Coastal Plain of New Jersey. U. S. Geological Survey Open File Report 97-243, 133 p. Identifiers denoted by 'M' are from Minard, J.P., 1969, Geology of the Sandy Hook quadrangle in Monmouth County, New Jersey. U. S. Geological Survey Bulletin 1276, 43 p.
-  **Slump block**—Block of Coastal Plain formations detached from outcrop and moved downslope as a result of slope failure. Of Holocene age. From Minard, J.P., 1974, Slump blocks of the Atlantic Highlands of New Jersey. U. S. Geological Survey Professional Paper 898, 24 p.

Base map from U. S. Geological Survey, 1954. Photorevised 1981.

Geology mapped 1995.

