



EXPLANATION

This map is intended to serve as an aid in reconnaissance evaluation of unconsolidated materials and can be used to identify areas of potential interest.

The units on this map indicate the first material of substantial thickness (generally greater than 3 feet (1 m) encountered beneath the soil layer. The soil layer (commonly a foot or two (about 0.5 m) thick) is not mapped. Other materials, different in composition, may underlie each map unit (see block diagram) or may occur as minor lenses within each map unit.

THIS MAP SHOULD NOT BE USED AS A SUBSTITUTE FOR ONSITE INVESTIGATION.

Most unconsolidated materials are mixtures of the three particle-size classes defined in the diagram below. This diagram also relates these three size classifications to the Wentworth classification (Wentworth, 1922) which can be compared with other classifications used in engineering and soil science.

PARTICLE-SIZE CLASSIFICATION		
Classification used in this report		
(Diameter, in inches)		
COARSE	MEDIUM	FINE
Boulders 16" to ∞	Gravel 2" to 16"	Sand 1/16" to 2"
		Silt 1/16" to 1/10"
		Clay less than 1/10"

Wentworth classification
Diameter, in millimeters

Coarse particles (stones) include granules, pebbles, cobbles, and boulders. Medium particles include very coarse, coarse, medium, and fine sand-sized particles. Fine particles include very fine sand-, silt-, and clay-sized particles. Very fine sand is included in this class because it commonly occurs with finer materials, and because very fine sand, silt, and clay behave similarly when water-soaked and under stress.

Materials mapping involves a visual estimate of particle-size distribution in a deposit by the field geologist. Percentages of particle sizes therefore may vary somewhat from place to place beyond the limits defined in the map units below.

g
GRAVEL
Particle sizes range from 100 percent coarse to 50 percent coarse and 50 percent medium. Materials may occur as layers of well- to poorly-sorted gravel, or as layers of gravel interbedded with layers of sand. May also contain minor amounts of fine particles

sg
SAND AND GRAVEL
Particle sizes range from 50 percent coarse and 50 percent medium to 25 percent coarse and 75 percent medium. Material may occur as thin layers of well-sorted sand interbedded with thin layers of well-sorted gravel; as poorly sorted layers of mixed sand and gravel; or as distinct pockets of well- to poorly-sorted sand and gravel. May contain minor amounts of fine particles

s
SAND
Particle sizes range from 25 percent coarse and 75 percent medium through 100 percent medium to 50 percent medium and 50 percent fine. Material commonly occurs as well- to poorly-sorted sand in layers of variable thickness

f
VERY FINE SAND, SILT, AND CLAY
Particle sizes range from 50 percent fine and 50 percent medium to 100 percent fine. Material commonly occurs as layers of poorly-sorted very fine sand, silt, and clay. May contain scattered coarser particles

t
TILL
Poorly sorted nonlayered mixture of coarse, medium, and fine particles in varying proportions. Some till, averaging less than 10 feet (3 m) thick, is sandy, loose, and very stony; other till, commonly more than 10 feet (3 m) thick, is less sandy, less stony, and very compact. Where these tills occur together, the loose, sandy till is always on top. The compact till forms the bulk of many smooth elongate hills (drumlins) even where the sandy till is exposed at the surface

sw
SWAMP DEPOSITS
Dark, decomposed organic material intermixed with varying amounts of sand, silt, and clay. Locally contains scattered stones

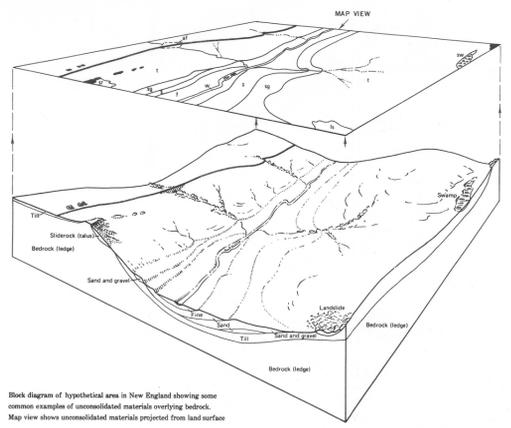
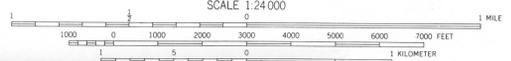
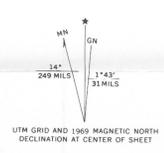
af
ARTIFICIAL FILL
Shown only for roads, highways, dams, solid-waste disposal, and other major construction. In addition, in urban centers and other areas of dense development, fill of variable thickness and extent may overlie the natural materials shown on the map

bedrock
BEDROCK (LEDGE) OUTCROP
Bedrock exposed at ground surface; may be partly covered by thin soil. Ruled pattern shows areas of small closely-spaced outcrops

w
WATER BODIES
In general, lakes and ponds greater than 5 acres, or streams wider than 200 feet (60 m)

SOURCES OF DATA
Leo, G. W., 1974, Surficial geologic map of the Ludlow quadrangle, Massachusetts: unpub. data.
Petersen, R. G., and Maevsky, Anthony, 1962, Western Massachusetts area: records and logs of selected wells and test holes, records of selected springs, and chemical analyses of water in western Massachusetts: U.S. Geol. Survey Massachusetts Basic Data Rept. 6, Ground-water Series, 31 p.
Wentworth, C. K., 1922, A scale of grade and class terms for clastic sediments: Jour. Geology, v. 30, p. 377-392.

Base from U.S. Geological Survey, 1969
10,000-foot grid based on Massachusetts coordinate system, mainland zone.
1000-meter Universal Transverse Mercator grid ticks, zone 18.



Block diagram of hypothetical area in New England showing some common examples of unconsolidated materials overlying bedrock. Map view shows unconsolidated materials projected from land surface.

MAP SHOWING UNCONSOLIDATED MATERIALS, LUDLOW QUADRANGLE, MASSACHUSETTS

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