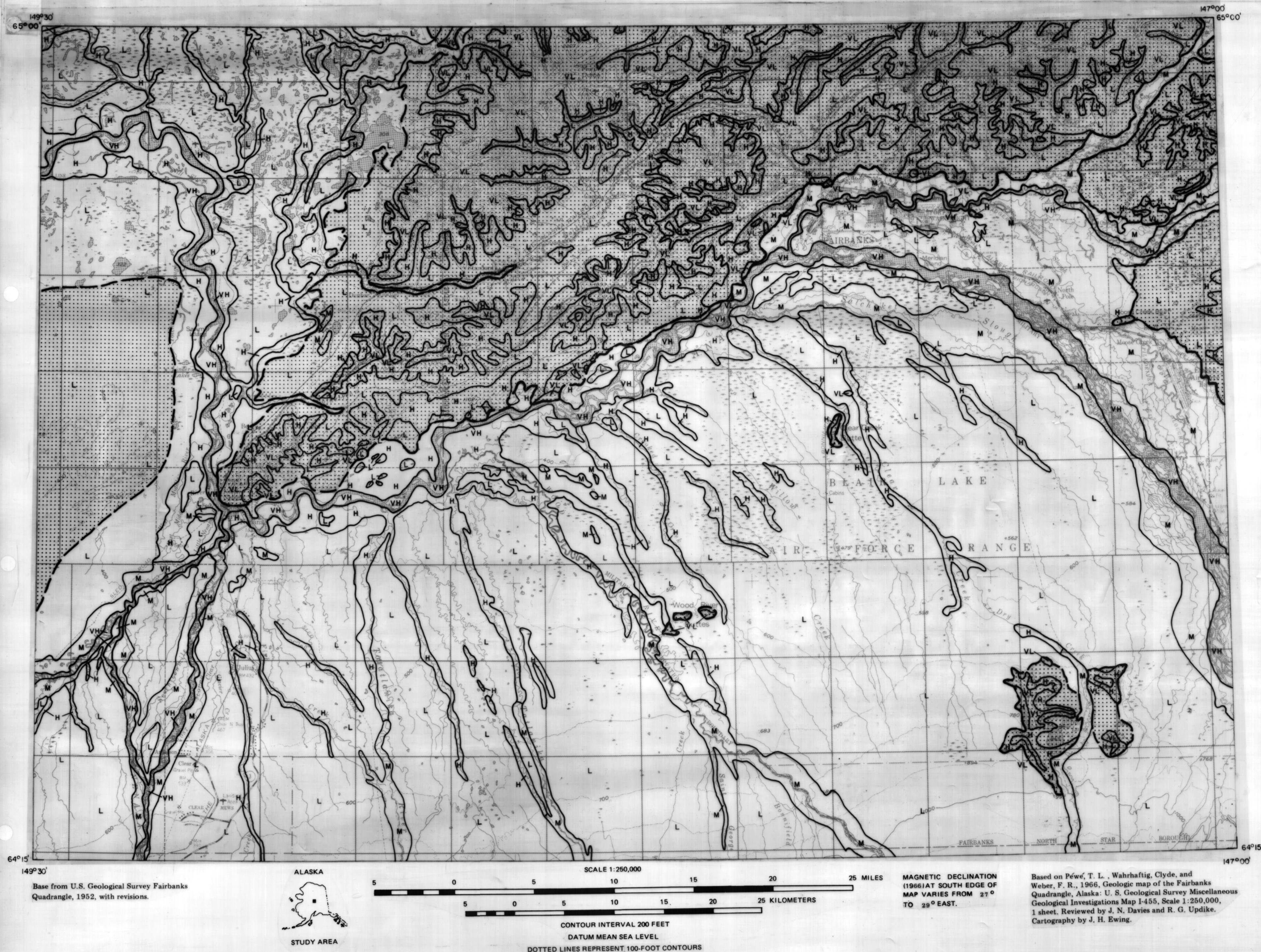




EXPLANATION

This derivative map shows the relative probability of encountering sediments that are likely to liquefy during strong earthquakes in the Fairbanks-Nenana area. Liquefaction susceptibility of sediments at any particular site is not shown; site-specific analysis is necessary to determine the presence of such sediments. Susceptibilities were assigned by applying the criteria of Youd and Perkins (1978) to geologic units as mapped by Péwé and others (1966), and by taking into account the presence or absence of continuous permafrost (see text and table 1).

Liquefaction susceptibility is independent of the water content of the deposit and the expected seismicity of the area. The map indicates the relative probability of occurrence of liquefaction somewhere in the deposit if it is water-saturated and if the area is subjected to sufficient ground shaking. Where the water table is deeper than about 10 m (33 ft), the probability of liquefaction-induced ground failure is low regardless of the assigned susceptibility. Where the water table is shallower than 10 m (33 ft) and is above the base of the deposit, the susceptibilities indicated on this map apply. Any condition that causes saturation of near-surface sediments where the water table is normally deep, such as locally deep seasonal thaw of the active frost layer in areas of poor drainage or flooding, may raise the liquefaction susceptibility to the indicated level.

DESCRIPTION OF MAP UNITS

Relative probability of encountering sediments that are likely to liquefy during strong earthquakes:

- VH** VERY HIGH—Holocene flood-plain alluvium in and near large, active river channels.
- H** HIGH—Silt and silty-sand facies of Holocene flood-plain alluvium away from large active river channels; also loess of late Pleistocene to Holocene age blanketing upland hillslopes.
- M** MEDIUM—Holocene dune sand and gravelly facies of Holocene flood-plain alluvium away from large, active river channels.
- L** LOW—Holocene glacial outwash, mine tailings, and swamp deposits; late Pleistocene to Holocene reworked dune sand, perennially frozen silt, alluvial-fan, and abandoned flood-plain deposits; Pleistocene dune sand.
- VL** VERY LOW—Bedrock.

MAP SYMBOLS

- Approximate contact between surficial geologic units with different liquefaction susceptibilities.
- Approximate boundary between areas where the water table is shallow and areas where the water table is deep.

Water-table depth

- Normally more than 10 m (33 ft) deep. Includes upland hills, where the water table is generally deep, and creek-valley bottoms and lower hillslopes, where the ground water is confined beneath permafrost that extends to depths greater than 10 m (33 ft). The layer of perched water above permafrost in valley bottom is normally too thin to permit significant earthquake-induced liquefaction.
- Normally less than 10 m (33 ft) deep.

This report is a preliminary publication of DGGS. The author is solely responsible for its content and will appreciate candid comments on the accuracy of the data as well as suggestions to improve the report.

PRELIMINARY LIQUEFACTION-SUSCEPTIBILITY MAP OF THE FAIRBANKS-NENANA AREA, ALASKA

by
R.A. COMBELICK
1984