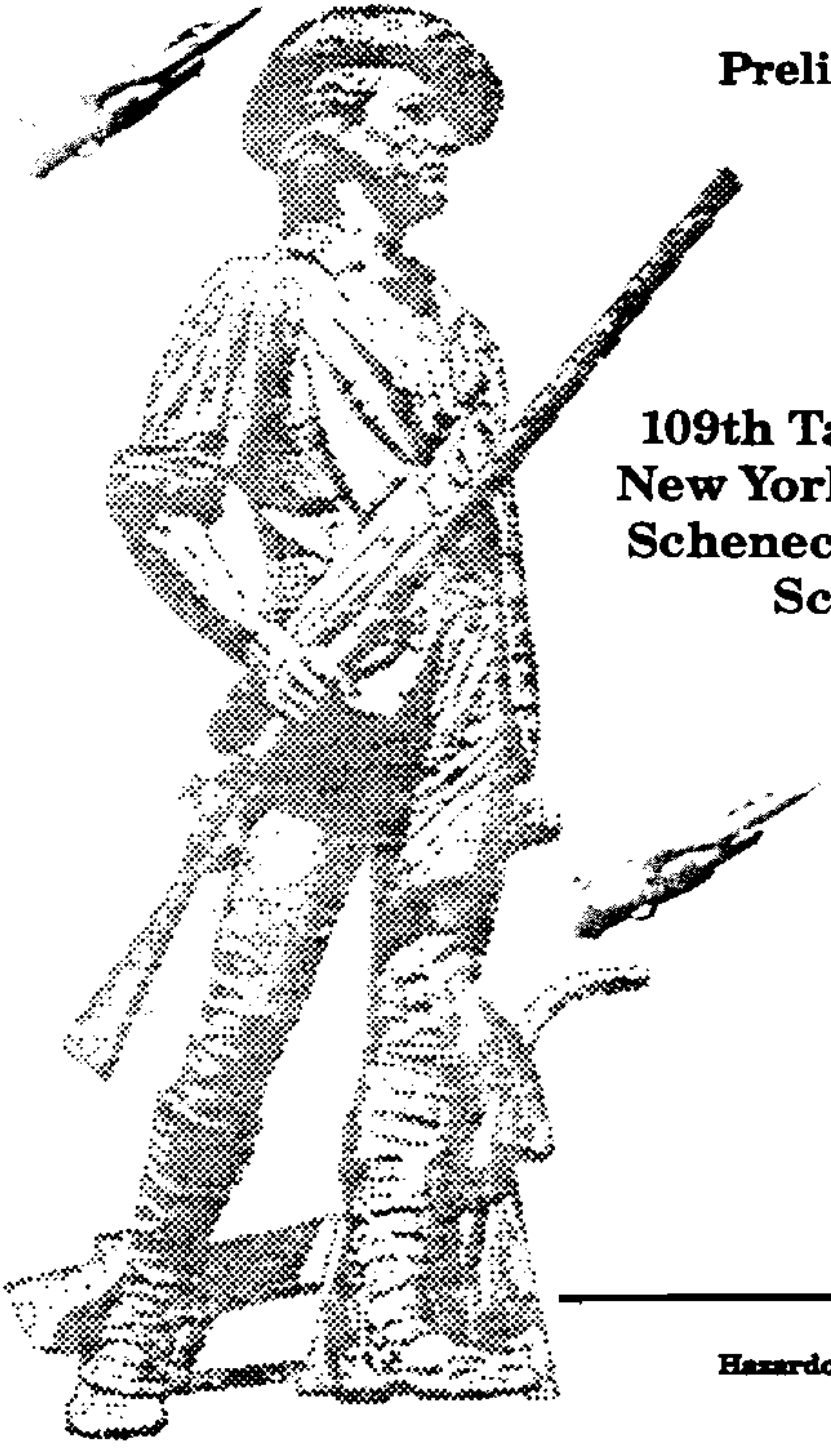
INSTALLATION RESTORATION PROGRAM



Preliminary Assessment

109th Tactical Airlift Group
New York Air National Guard
Schenectady County Airport
Scotia, New York

Hazardous Materials Technical Center

June 1989

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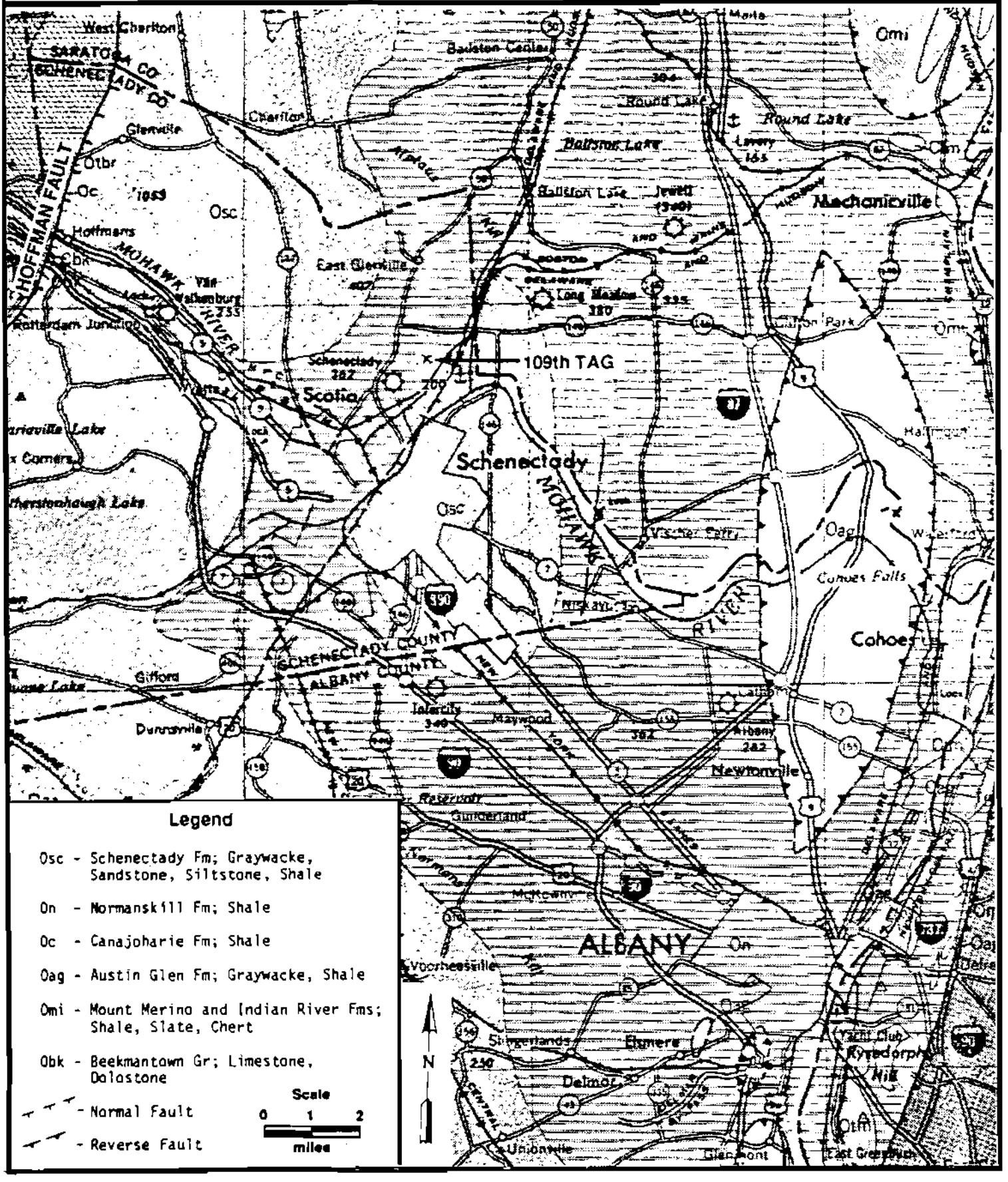
Source: Geologic Map of New York State, Hudson-Mohawk sheet, New York Education Dept., Chart Series, No.15, 1970.

Figure 3.
Geologic Map of the 109th TAG, New York Air National Guard, and Vicinity.



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Adapted from: State of New York Conservation Department (1965).

Figure 4.
Surficial Materials Map of 109th TAG, and Vicinity

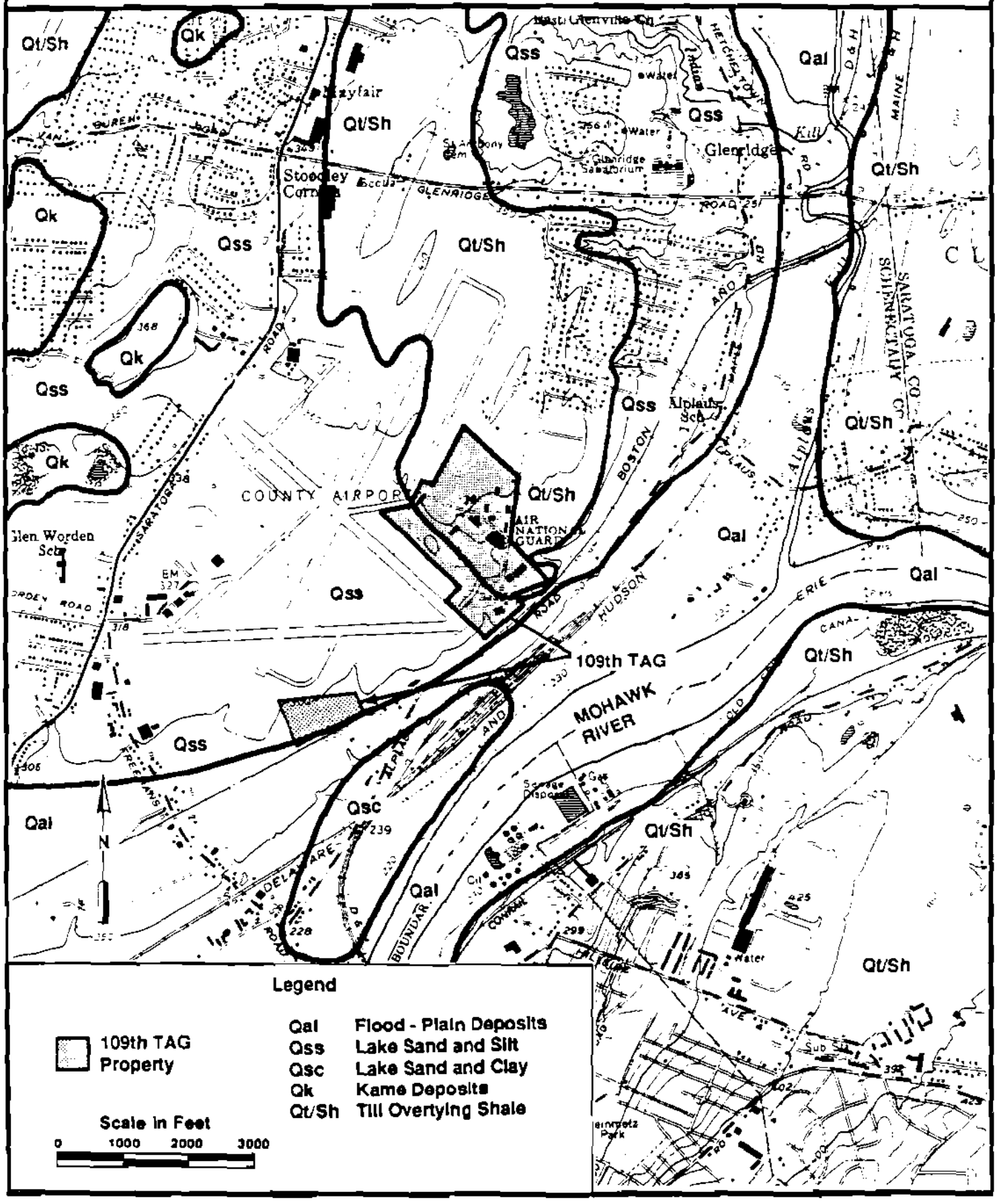

Table 1. Geologic Formations in Eastern Schenectady County and Their Water-bearing Characteristics

Class	Age		Geologic formation or unit 1/	Maximum thickness 2/ (feet)	Character of material	Water-bearing properties
Unconsolidated deposits	Quaternary	Recent	Flood plain deposits	50	Silt and sand, clayey. Contains a few thin beds of sand and gravel. Includes some organic material.	Not important as a source of groundwater because of limited thickness in most areas. Dug and shallow drilled wells generally yield sufficient water for domestic needs. In areas where deposits contain a considerable amount of sand and some fine gravel, wells may yield more than 100 gpm.
		Pleistocene	Coarse channel deposits	150	Interbedded sand, sand and gravel. Includes a few thin beds of finer-grained material.	Exceptionally permeable materials restricted principally to the Mohawk valley upstream from the Schenectady and Rotterdam well field area. Yields of more than 3,500 gpm may be drawn from properly constructed wells where infiltration from the Mohawk River is possible.
			Lacustrine sand and silt	200	Principally sand and silt. Contains beds of medium- to coarse-grained sand and a few thin, narrow and discontinuous lenses of sand and gravel. Where thick, the lower parts of the deposit contain some beds of clay.	Wells generally yield between 5 and 20 gpm, but wells that penetrate one of the few discontinuous lenses of sand or gravel may yield more than 100 gpm.
			Kame deposits	80	Principally medium-grained sand. Contains beds and lenses of coarse-grained sand and some fine gravel.	Wells generally yield between 20 and 100 gpm. Wells that penetrate one or more layers of the coarse sand and gravel may yield as much as 350 gpm.
			Laminated silt and clay	50	Alternating laminae, or thin beds, of silt and clay. Contains some beds of sand.	Generally yields less than 1 gpm. Most wells in areas of laminated silt and clay are drilled through these deposits into the underlying till or bedrock.

1/ Names of the bedrock units conform with usage of the U.S. Geological Survey. It also conforms with the nomenclature used on the geologic map of New York (Fisher and others, 1962).

2/ Thickness of bedrock units in eastern Schenectady County were provided by D.W. Fisher, State Paleontologist, New York State Museum and Science Service (oral communication, 1962).

Table 1. Geologic Formations in Eastern Schenectady County and Their Water-bearing Characteristics (Continued)

Class	Age		Geologic formation or unit 1/	Maximum thickness 2/ (feet)	Character of material		Water-bearing properties
Unconsolidated deposits	Quaternary	Pleistocene	Till	170	Unsorted mixture of all grain sizes (clay to boulders) deposited by glacial ice. Usually contains thin, narrow, and discontinuous lenses of silt, sand, or sand and gravel.		Generally yields only small amounts of water. The yield of a well in till is largely determined by the number of water-bearing properties of lenses of silt, sand, or sand and gravel that are intersected by the well. The yield of wells in till is usually sufficient for limited domestic requirements except in late summer and fall when some are inadequate.
Bedrock	Ordovician		Schenectady Formation	1,500	Black and gray shale and some beds of dense siltstone and sandstone. Forms the bedrock surface in most of eastern Schenectady County.		Poor source of groundwater. Water occurs principally in openings along joints and the yield of a well largely depends upon the number of joints that are intersected by the well. Inasmuch as the rock itself is relatively impermeable, and the number and width of joints decreases with depth, deepening a well in bedrock more than 100 to 200 feet below the rock surface usually does not result in increased yield. The yield of wells in limestone or dolomite may be slightly greater than those in shale owing to enlargement of joint openings by solution of the rock. The yield of wells in bedrock is usually adequate for limited domestic requirements. Water from bedrock may contain objectionable amounts of hydrogen sulfide gas (H_2S) or dissolved mineral constituents.
			Snake Hill Formation	600-800	Dark gray silty shale, intensely folded. Forms the bedrock surface east of a north-south trending fault approximately through Lock 7.		
			Canajoharie Shale	400-500	Black shale, carbonaceous and more or less calcareous.	Form rock surface west of Hoffmans Fault	
			Undifferentiated limestone and dolomite units of the Trenton and Black River Groups	45-55	Limestone and dolomite.		
			Tribes Hill Limestone	175-200	Limestone and dolomite.		
	Cambrian		Little Falls Dolomite	400	Dolomite.		

1/ Names of the bedrock units conform with usage of the U.S. Geological Survey. It also conforms with the nomenclature used on the geologic map of New York (Fisher and others, 1962).

2/ Thickness of bedrock units in eastern Schenectady County were provided by D.W. Fisher, State Paleontologist, New York State Museum and Science Service (oral communication, 1962).

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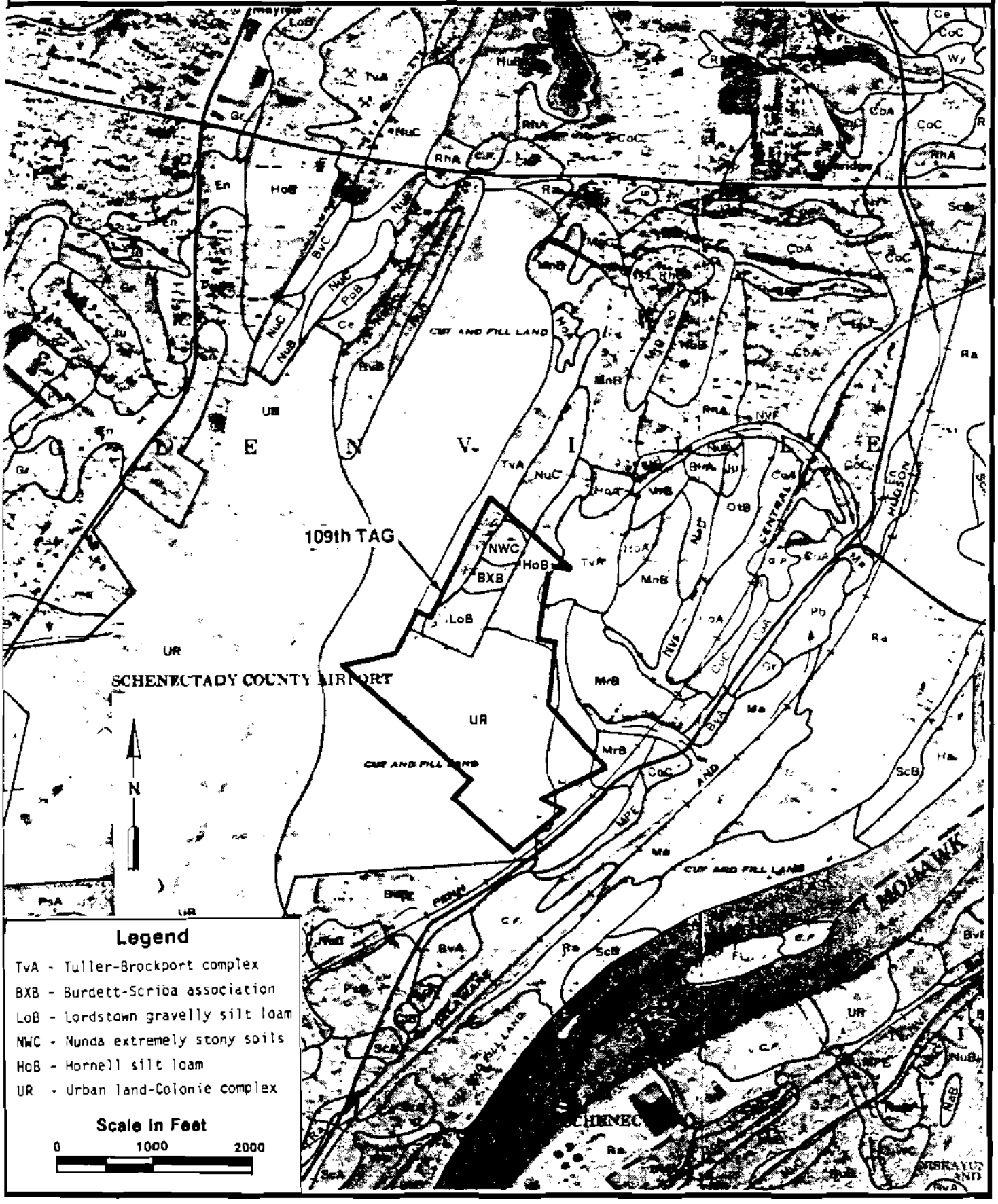
Source:
Survey of Schenectady and
Montgomery Counties (1978)

Figure 5.
Soils Map of the 109th TAG, New York
Air National Guard, and Vicinity.



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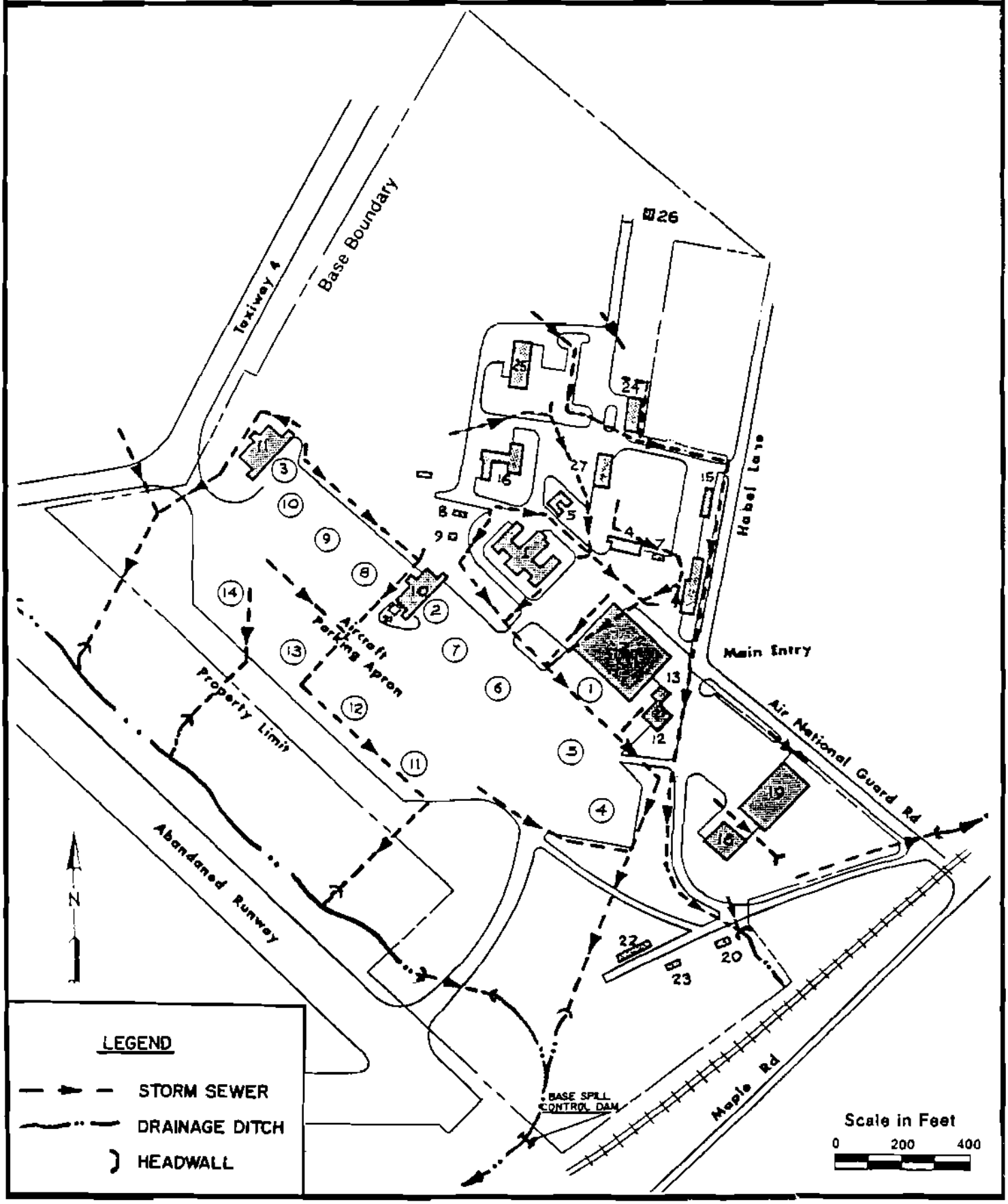
Source:
Base Master Plan (1985)

Figure 6.
Storm Drainage Map, 109th TAG, New York Air National Guard, Schenectady County Airport, Scotia, New York.



recorded on the Mohawk River at Cohoes (as of 1965) was 130,000 cubic feet per second during flooding on March 19, 1936.

The Alplaus Kill drains an area of 54.3 square miles above Glenridge. The flow characteristics and records of the Alplaus Kill indicate that 95 percent of the time a streamflow rate of 0.028 million gallons per day per square miles will exist or be exceeded.

Groundwater

Specific information on the occurrence and movement of groundwater on the Base is only poorly developed. The town of Glenville, which has four municipal water wells, supplies water to the Base and to most of the residences north and east of the Base. The Glenville wells are located approximately 5 miles west of the Base and each is between 50 and 60 feet deep. One private residence with a 76-foot deep drinking water well is located approximately 50 feet from the eastern boundary of the Base (see Figure 9, page IV-5, for well locations). Three additional residences within 600 feet of the Base's eastern boundary previously used drinking water wells, but recently have been supplied with municipal water; these three wells are now used for gardening and lawn maintenance. Figure 7 shows the potential yields in the vicinity of the Base.

All of the bedrock formations in the Schenectady area are poor sources of water, because these rocks are relatively impermeable. Water occurs principally in openings along joints and fractures in the bedrock. A weathered or fractured zone generally occurs in the upper few feet of the bedrock and this is the most common zone to contain groundwater. The frequency and size of joints and fractures decreases with depth due to the pressure of the overlying rock (Winslow and others, 1965).

In most of the area, till that does not contain lenses of sand and silt is essentially impermeable, with hydraulic conductivity in the range of 1.9×10^{-7} to 4.7×10^{-8} cm/sec. On the Base property, a clayey silt till, with some sand and shaly gravel, covers the entire area and ranges in thickness from 1

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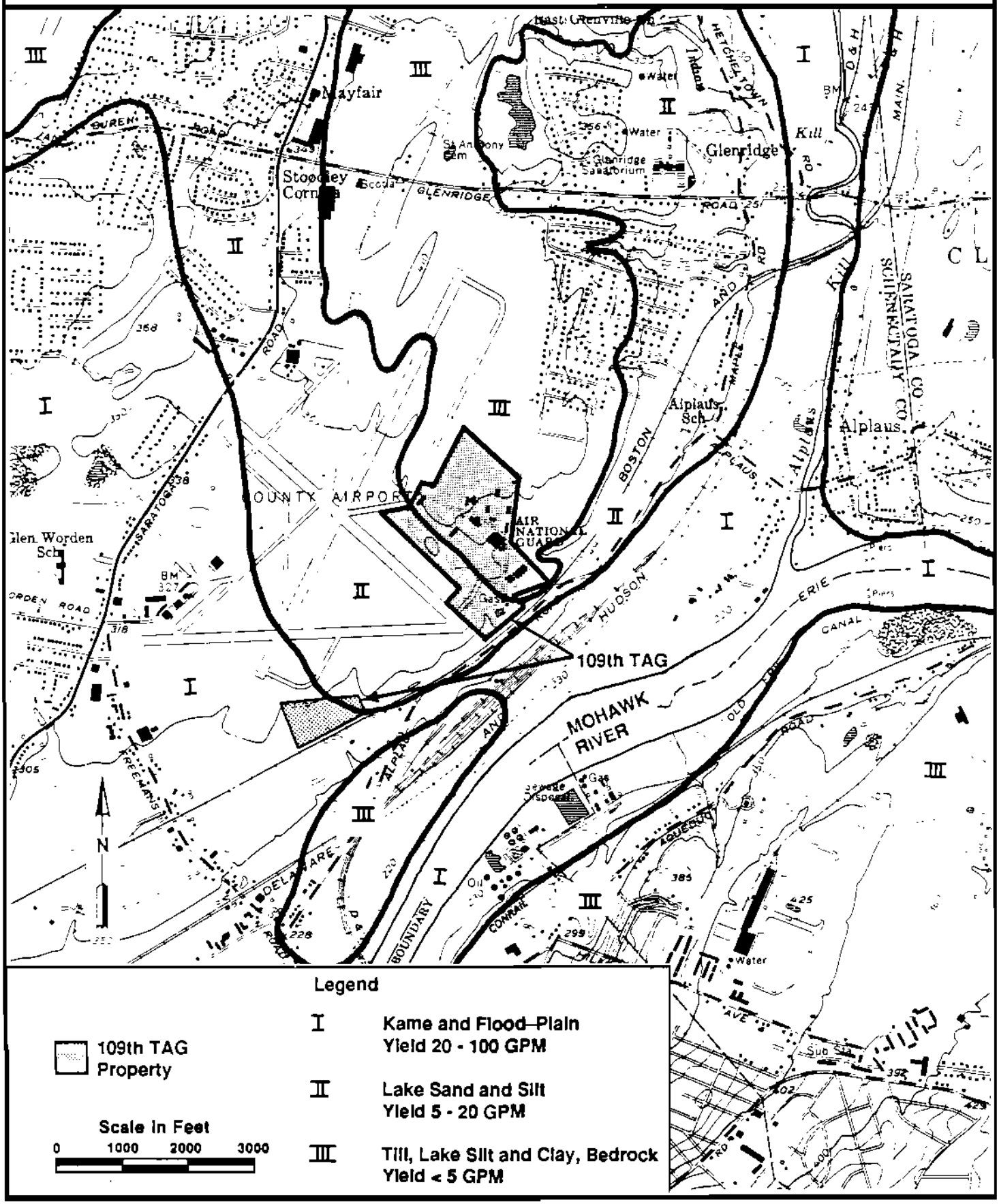
Adapted from: State of New York Conservation Department (1965).

Figure 7.
Hydrologic Map Showing Potential Well Yields from Geologic Materials; 109th TAG, and Vicinity.



to greater than 12 feet. In some localities on the Base, groundwater in this till may be encountered at less than 1 foot deep during the wet season.

The old Lake Albany sands and silts overlie either the shale bedrock or the tills in the area surrounding the Base. The sands are generally less than 45 feet thick in this area but can be over 100 feet thick. Permeability of these deposits is very high, and these deposits are excellent sources of groundwater. The sands are medium- to coarse-grained in the upper section of the deposit and grade to medium- to fine-grained in the lower section. Hydraulic conductivity in the silts and fine sand may range from 9.4×10^{-4} to 4.7×10^{-3} cm/sec. In coarser grained sands, the hydraulic conductivity may be up to 4.7×10^{-2} cm/sec.

The kame deposits northwest of the Base consist principally of medium-grained sand with beds of coarse-grained sand and gravel. The hydraulic conductivity of the kame deposits is generally greater than that of the lake sands and has been estimated in some deposits to be 6.6×10^{-2} cm/sec.

Recent flood plain alluvium occurs in both the Mohawk River and in the Alplaus Kill that border the Base on the south and east. These deposits are 20 to 30 feet thick and consist of silt and sand with some clay and organics. Wells in flood plain deposits usually yield 20 to 100 gpm and pumping of these wells can create direct infiltration of surface waters from rivers or streams. Coarser channel sediments were deposited by the Mohawk River during the Pleistocene epoch. These older channel deposits are exceptionally permeable and are in direct connection to the present Mohawk River.

The water table in the Schenectady area generally mimics the topography of the land surface and, therefore, groundwater moves in the direction of land-surface slope. Regional groundwater flow at the Base is southeast toward the Mohawk River (Winslow and others, 1965). Water table contours and groundwater flow directions are illustrated in Figure 8.

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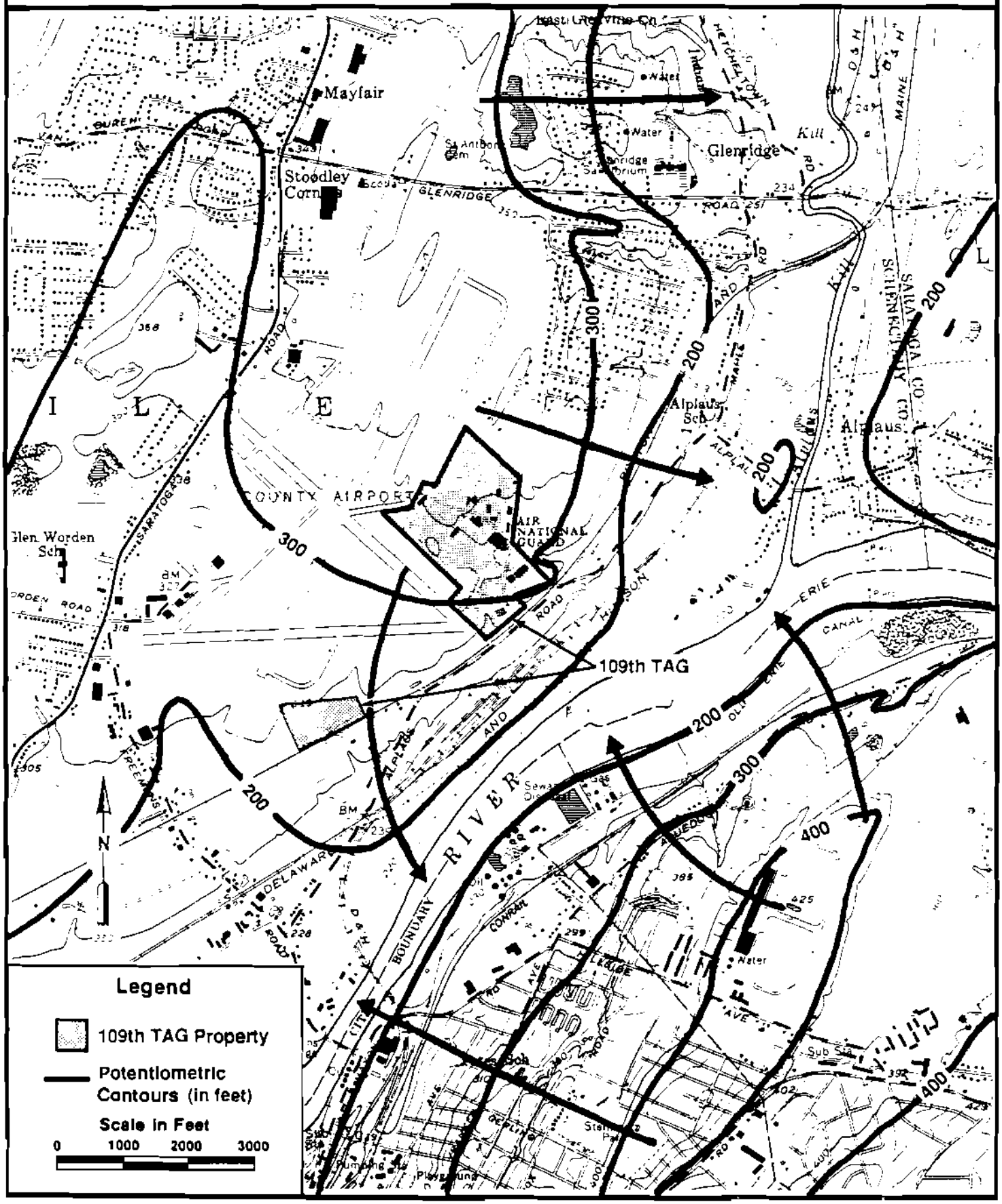
Adapted from: State of New York Conservation Department, 1965.

Figure 8.
Potentiometric Map of the 109th TAG, and Vicinity.



E. Critical Environments

According to the New York State Department of Environmental Conservation, Bureau of Wildlife, there are no endangered or threatened species of flora or fauna within a 1-mile radius of the Base. Furthermore, there are no other critical environments within a 1-mile radius of the Base.