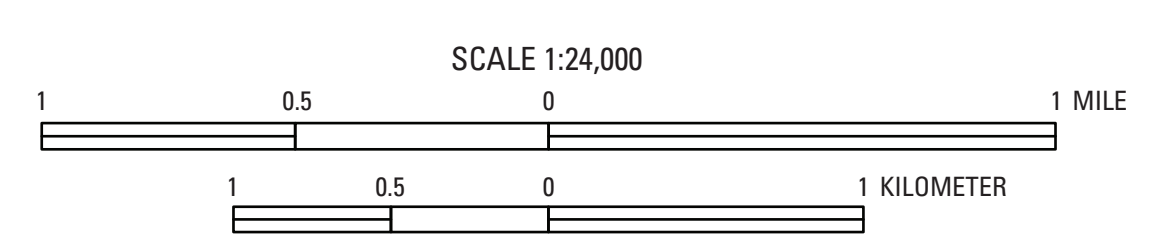
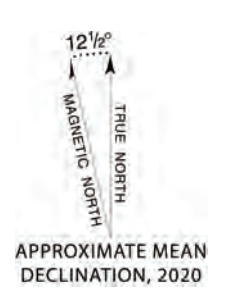


Base elevation image from 2-meter lidar  
New York State Geographic Information Systems, 2007  
North American Vertical Datum of 1988  
North American Datum of 1983

Well data from Fisher and others, 2021  
Geology compiled by P.M. Heisig, 2021



### EXPLANATION

**Postglacial deposits (Holocene)**

- lf** Landfill—Inactive sites; three localities limited to the Susquehanna River valley
- w** Open water—Areas of open water such as rivers, lakes, large ponds, and reservoirs
- al** Alluvium—Postglacial river and stream floodplain deposits consisting predominantly of stratified silt and clean to silty sand, commonly with some gravel at the base of the deposit. Thickness as much as 10 to 40 feet (ft) in the Susquehanna River valley and 1 to 10 ft in the smaller tributaries. Typically underlain by stratified glacial and lacustrine deposits in main valleys and by till in upland valleys
- alf** Alluvial fan—Fan-shaped accumulations of stratified silt, sand, and gravel, deposited by tributary streams where they enter the Susquehanna River valley. Fans are typically underlain by outwash or coarse sand and gravel derived, in part, from the drainage area of the alluvial fan  
  
Alluvial-fan deposits have relatively high permeability but are relatively thin and largely unsaturated; however, fan deposits are an important conduit for recharge to underlying permeable glacial deposits. Infiltration of water from precipitation and tributary streams that lose flow as they traverse fan deposits (Randall, 1978) are important sources of recharge to underlying stratified glacial deposits that define the valley-fill aquifer

**Glacial deposits (Pleistocene)**

- osg** Outwash sand and gravel—Proglacial river and stream floodplain deposits consisting predominantly of stratified silt and clean to silty sand, commonly with some gravel at the base of the deposit. Thickness as much as 15 to 25 ft in the Susquehanna River valley and most tributary valleys. Typically underlain by stratified glacial and lacustrine deposits in main valleys and by till or bedrock in upland valleys. Typically permeable but generally thin saturated thickness
- ic (?)** Ice-contact deposits—Stratified sand, gravel, and silt deposited by meltwater in both subaerial and subaqueous environments adjacent to glacial ice. May include isolated kames in valley areas of ice stagnation or occur as subaqueous (lacustrine) fans in the subsurface overlying bedrock in areas of active ice retreat. May be interbedded with diamict. These deposits exhibit moderate to high permeability, especially in coarse, well-sorted facies. Question mark indicates uncertainty
- t** Till—Unsorted, unstratified mixture of clay, silt, sand, gravel, and boulders deposited beneath the ice as lodgment till during a glacial advance or at the edge of the ice sheet by melting ice as ablation till during a pause, or retreat, of the ice front. Found mostly in uplands. Thickness ranges from more than 30 to 220 ft. Very low permeability, but may yield adequate amounts of water for domestic use from gravelly zones of higher permeability
- tv** Valley till—Unsorted, unstratified mixture of clay, silt, sand, gravel, and boulders, typically deposited beneath the ice as lodgment till during a glacial advance or readvance. Occurs along the confining walls of the Susquehanna River valley, and may overlie sand and gravel. Thickness ranges from 40 to 90 ft
- ts** Slumped till—Unsorted, unstratified mixture of clay, silt, sand, gravel, and boulders. Originally deposited beneath ice as lodgment till during a glacial advance/readvance or by melting ice as ablation till. Occurs on convex landforms overlying valley till at the base of concave slopes as described by King and Coates (1973). Thickness ranges from 55 to 100 ft
- tt/r** Thin till over bedrock—Thin, discontinuous veneer of till, typically 0 to 30 ft thick, over fractured bedrock

**Aquifers**

- lc** Lacustrine deposits over sand and gravel (confined)—Fine-grained lacustrine sediment associated with Glacial Lake Great Bend, which formed as a result of a temporary ice dam near Binghamton, New York (Braun, 1999). Often interbedded with till and confined sand and gravel of unknown origin and age
- tc** Till over sand and gravel (confined)—Unsorted, unstratified mixture of clay, silt, sand, gravel, and boulders (possibly undifferentiated diamict) that overlies and confines sand and gravel of unknown origin and age. In some of these areas, other unconsolidated sediments at land surface overlie the till, so are mapped
- Generalized valley aquifer boundary—Identifies the approximate boundary between stratified sediments in the Susquehanna River valley and either bedrock or till valley walls, or hills of bedrock and till within the valleys
- Unconfined aquifers—Thick deposits of sand and gravel, most likely outwash but possibly ice-contact deposits at depth. Boundaries are approximate and are determined only by nearby well records

**Cross section**

- A-A'** Trace of hydrogeologic section—Individual cross sections are included as separate illustrations (figures 6–12) in the report

**Wells (Fisher and others, 2021)**

- BM 31** Well—Completed in bedrock; mostly domestic. Label corresponds to site name assigned by the U.S. Geological Survey (BM = Broome County)
- BM 1** Well—Completed in stratified glacial deposits; mostly domestic. Label corresponds to site name assigned by the U.S. Geological Survey (BM = Broome County)
- Well—Unknown completion (whether it terminated in bedrock or stratified deposits)
- Well with reported natural gas and high dissolved solids (or mineral) content

**Other map features**

- City and town boundaries
- Binghamton East quadrangle boundary
- Roads
- Approximate ice margins
- Town or hamlet

Any use of trade, product, or firm names in this publication is for descriptive purposes only and does not imply endorsement by the U.S. Government.

If map is printed on a plotter, XY accuracy may vary due to humidity and temperature.

Not for navigational use.

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## Detailed Aquifer Mapping of the Susquehanna River Valley in South-Central Broome County, Towns of Conklin and Kirkwood, New York

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2021