

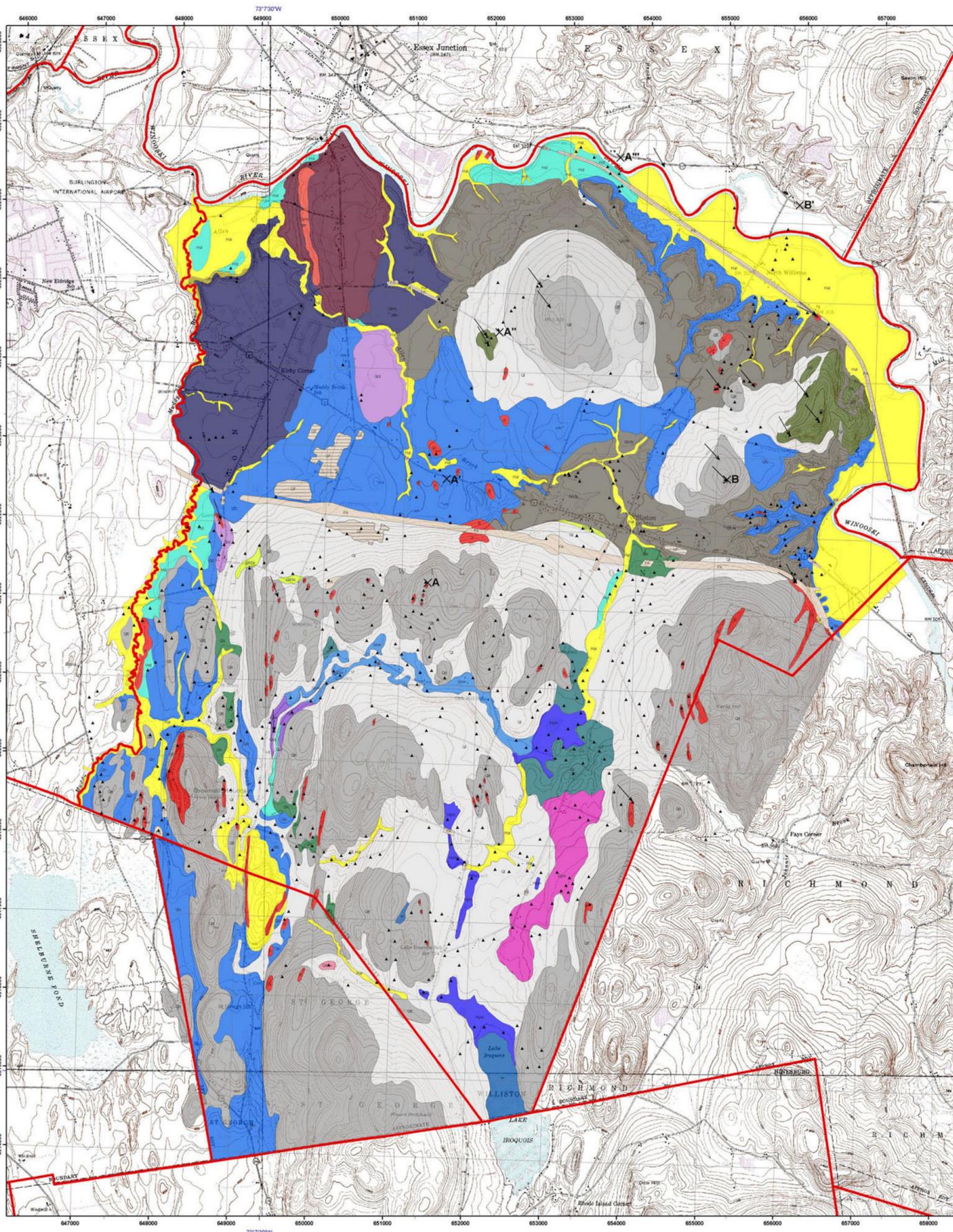
LEGEND

Description of Map Units

- FA** Artificial Fill. Artificially emplaced earth along rail beds, road beds, embankments and low lying areas. There is extensive fill along the interstate and along road approaches to the interstate.
- GF** Graded or Filled. Areas of extensive grading and/or filling, commonly associated with buildings, parking lots, or roads.
- Hpm** Holocene Peat & Muck. Organic sediment, mostly silt and clay with minor but variable sand in wetlands and swamps; low lying flat lands prone to flooding.
- Hal** Holocene Alluvium. Silt, sand, pebble gravel, cobble gravel, and boulder gravel deposited by modern streams. Deposits include stream channel and and bar deposits and finer-grained floodplain deposits. Minor wetland deposits are common. Thickness is highly variable with the deposits along the smaller streams typically less than 3 meters thick. Thicknesses in the Winooksi River floodplain are greater. Permeability usually intermediate to low. Can be good aquifer if sufficiently thick but of limited aerial extent. These areas are typically flooded yearly or every few years.
- Hst** Holocene Stream Terrace Deposits. Silt, sand, pebble gravel, cobble gravel, and boulder gravel deposited on terraces above the modern floodplains of streams. In the northwestern part of Williston these deposits lie below 350 to 320 feet. Generally less than 5 meters thick. Variable permeability but usually intermediate. Fair to good aquifer. The terrace surfaces are rarely flooded, if at all. However, these deposits are highly erodible and are quite susceptible to stream erosion and slope failure.
- Qms** Quaternary Marine Sand. Deposited in the Champlain Sea and limited to areas below about 350 to 320 feet. Although previous studies clearly indicate that much of the material is deltaic in origin, delta deposits are not distinguished in this study due to lack of adequate exposures.
- Qmb** Quaternary Marine Beach or Shoreline Deposits. Shoreline deposits of sand or pebbly sand deposited on the margin of the Champlain Sea.
- Qmc** Quaternary Marine Clay and Silt. Commonly massive, gray, clay and silt deposited in the Champlain Sea and lacking the laminations characteristic of the Lake Vermont lacustrine clays and silts described below. Poorly exposed.
- Qlbcv** Quaternary Beach and Shoreline Deposits of Coveville Stage of Glacial Lake Vermont. Well to poorly sorted sand or well to poorly sorted gravel. Formed in shallow water environments. Sands deposited in lower energy embayments, including tombolos and as sand spits; gravels deposited in higher energy open beaches and offshore bars. Minor beach landforms with wave winnowed till were observed in two isolated areas along Walker Hill Road.
- Qlbf** Quaternary Beach and Shoreline Deposits of Fort Ann Stage of Glacial Lake Vermont. For description, see Qlbcv above.
- Qls** Quaternary Lake Sand. Well sorted, laminated fine to medium sand underlying plains; prone to gully and headward erosion; moderately good aquifer if thick, poor if thin. Several areas of lake sand were noted, primarily along the lower portions of the Sucker Brook drainage basin in the southwestern part of town. The deposits are highly erodible and are prone to gully.
- Qlsfa** Quaternary Lake Sand of Fort Ann Stage. Similar to Lake Sand described above. Extensive deposits near the Center of Williston, in eastern Williston north of U.S. Rt. 2, and south of the railroad tracks in northern Williston. Much of this material was deposited in deltaic environments. A sand pit south of North Williston displays trimmed foreset beds with shallow dips to the north.
- Qlc** Quaternary Lake Clay and Silt. Fine grained varved or thinly laminated deposits of silt and clay accumulated in the deeper portions of lake basins; gravel and sand lenses may be present within the sequence but especially toward the bottom; prone to landsliding and gully, poorly drained and a poor aquifer. The lake sediments may be fairly thick, blanketing the underlying bedrock on flat areas, but form a relatively thin veneer on gentle to steep slopes and low hill summits, where ledge and thin till may also be present or predominate. Steeply sloping areas of lake silt and clay that lead down to alluvium areas are particularly prone to stream bank failures and headward erosion of the slopes.
- Qlq** Quaternary Lake Deposits over Till. Thin lacustrine deposits (undifferentiated sand to clay) over till. Generally less than 2 meters of lacustrine.
- Qiw** Quaternary Inwash. Stratified fluvial sand, sand and gravel, or gravel deposited where uplands transition to lowlands and associated with other ice contact sediment or accumulated against an ice margin and having one ice contact side, typically the distal side; well drained and, if thick, a good aquifer. An area of inwash is mapped along the lower portion of Sucker Brook. The sediment exposed along the banks is a mixture of sand and gravel and the basal portion of the deposit displays deformation likely due to ice melting. As the melt water source of the sediment was up valley in the Mud Pond area, this sediment is mapped as inwash where it is inferred to have been deposited against melting ice in the Champlain Valley west of Sucker Brook. The sediment is very permeable and several meters thick. The deposits are moderately to highly erodible.
- Qow** Quaternary Outwash. Glacial melt water deposits of well sorted gravel and sand typically greater than 5 meters thick; gently sloping to flat lands which may be pitted due to melt ice blocks; intermediate to high permeability. Outwash sand and gravel is mapped along the upper portion of the Sucker Brook basin, particularly within the east-west channel that heads near Mud Pond. Melting glacial ice at Mud Pond was the inferred water and sediment source. The deposits are moderately to highly erodible.
- Qk** Quaternary Kame Deposit. Undifferentiated hummocky terrain; glacial deposits from streams, slumps and deposition by ice; stratified and unstratified sand, gravel and boulders with variable silt, rolling, hilly lands to individual hills. One significant area of kamic terrain was mapped in the Mud Pond region. The individual kames near the Mud Pond parking area are relatively steep sided and relatively tall conical hills of sand and gravel sediment deposited by melt water. Erratic boulders also occur.
- Qgm** Quaternary Ground Moraine Deposits. Hummocky till with sand and gravel; ice contact sediment flow, melt water and ice deposited sediments of variable texture ranging from stratified and well sorted gravel and sand to unstratified and poorly sorted silt, sand, gravel and boulders; thickness is variable and rock outcrops may protrude; low to high permeability; limited local slope stability problems. Gently rolling hills and elongate smoothed hills are possible. An extensive area of ground moraine occurs east of South Road.
- Qtd** Quaternary Till, Deformed. Sediment displays internal deformation structures such as folds and faults and indicates re-sedimentation and/or ice push due to advancing or overriding glacial ice; sediment textures vary but are generally similar to lodgement till and may include re-sedimented fine grained lacustrine deposits of a silt-clay-sand texture; lateral and vertical variations in texture and structure may be rapid; folds and faults may display a shear sense of motion; sediment similar to lodgement till in density, permeability and slope stability characteristics. Minor areas of deformed till were mapped in the area near the Griswold quarry and in the Sucker Brook stream remediation area. Generally low permeability and poor aquifer potential.
- Qt** Quaternary Thick Till. Poorly sorted diamict with abundant angular to subangular clasts. Matrix is dominated by silt or clay; few sites have a fine-sand matrix. Clasts range in size up to large boulders. Deposits are typically unstratified, although some contain deformed stratified units that may be re-deposited diamictions from subaqueous or subglacial flows. Thickness generally greater than 3 meters. Surface boulders are common. Smoothed/streamlined hills in the valley and gently undulating slopes on the lower mountain flanks to nearly flat plains dotted with erratics. The blanket of thick lodgement till in areas along Sunset Hill Rd and portions of South and Oak Hill Rds. exceeds 100R in thickness. Generally low permeability and poor aquifer potential.
- Qtt** Quaternary Till, Thin. Similar to thick till described above, but thickness generally less than 3 meters with rock outcrops common. Surface boulders or erratics are common. Occurs on moderate to steep mountain slopes and summit areas. Till veneer areas are found on the higher terrain and on the low ridges in the lower portions of the town. Generally low permeability. Generally poor aquifer potential.
- Qtw** Quaternary Washed Till. Similar to the thin till described above, but limited to upper hill slopes above about 500 feet elevation. These slopes were exposed to wave action as water levels dropped from the Upper Fort Ann stage to the Lower Fort Ann stage. Wave action resulted in the winnowing of fines, leaving abundant till boulders on the land surface.
- R** Rock outcrop; includes areas of outcrop with patches of till or slump debris; slopes are generally stable except very steep slopes where rock slides and rock falls may occur.
- SR** Area of abundant rock outcrops interspersed among thin surficial deposits.

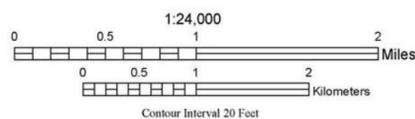
Explanation of Map Symbols

- ▲ Surficial Materials Locations
- ↑ Ice Motion Indicators
- × Cross Section Endpoints
- Town Boundaries



Base map from U.S. Geological Survey.
 Quadrangle names printed in blue.
 Coordinate System: Vermont State Plane, meters, NAD 83.
 Geographic coordinates shown at topo corners are in NAD 83.
 Grid overlay on map is Universal Transverse Mercator,
 Zone 18N, NAD 27.

Digital Cartography by George Springston and
 Marjorie Gale
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SURFICIAL GEOLOGIC MAP OF THE TOWN OF WILLISTON, VERMONT

by
George Springston and David DeSimone
 2007



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