

The Richford 7.5-minute Quadrangle was mapped as part of the 2021 National Cooperative Geologic Mapping Program funded STATEMAP project (award #G21AC10870). This quadrangle was one of eighteen quadrangles to mapped as part of the Tioga County Surficial Geologic mapping project currently being undertaken by the NYSGS starting in 2019 and concluding sometime in the mid to late-2020's. The purpose of this map was to identify and delineate various surficial and geologic materials with the intent that this information can guide municipalities in land use, environmental and natural resource decisions across its roughly 55 square mile area.

This quadrangle is situated within the Allegheny Plateau physiographic province is generally ramping higher elevations ridges to the south of the Town of Newfield with deep valleys between them. There is roughly 905 feet (276 meters) of elevation change between the highest peak just east of Valley View Rd at 1,880 feet above mean sea level (573 meters-amsl) to the southern end of the main valley floors at 976 feet-amsl (298 meters-amsl). The East Branch of the Oswego Creek, the West Branch of the Oswego Creek, and Wilson Creek are the major water bodies in the area along with various unnamed ponds at higher elevations.

The surficial geologic units in this quadrangle were previously mapped at 1:250,000 scale and were reported to be outwash gravels, kame, till, and alluvium (Muller and Cadwell, 1986). Limited mapping has been completed at a higher resolution than that of Muller and Cadwell, (1986).

To create the surficial geology map of the West Dunes quadrangle, preliminary field maps were imported using the ESRI ArcMap 10.8 software and consisted of all available topographic data (roads, land surface terrain and hydrography) to plot all field data on including field stops, bedrock outcrops and important site information. Surficial soil sampling employed the use of a five-and-a-half-foot hand auger to allow sampling below the variably thick organic soil horizon (below the topsoil). Another tool used is an entrenching shovel and pick. This tool was used to remove topsoil and/or eroded sediments from outcrops or exposures to expose fresh sediments for analysis. At each field stop, the coordinates (latitude and longitude in decimal degrees) were taken using a Garmin GPS 660t, descriptive notes on the sediment found, whether a sample and/or a high-resolution, scaled photo were taken, and the time at which the stop was taken were logged into a field notebook (Backhaus, 22

The final surficial geologic map, cross-section and elevation maps were produced using the ESRI ArcMap and Adobe Illustrator CS6 programs. The cross-sections were created in ArcMap using the XActo Cross-section 10 tool developed by Jennifer Carell, formerly of the Illinois Geologic Survey, and then exporting the cross-section into Adobe Illustrator to connect the stratigraphic units. The surficial geologic map was created by scanning the mylar sheet (RFD, Backhaus, Mylar_22) drafted from the geologic field map. Polygons were then produced by digitizing this map in ArcMap and colored according to surficial geologic units found within the quadrangle. The final map was drafted in Adobe Illustrator and exported as a PDF file.

This unit is generally composed of coarse/fine, large cement mounds and/or crushed rock anthropogenically transported and used for construction purposes. This material is used in artificial dams, built to retain water, and large, raised roadbeds for bridges within the quadrangle.

Unsorted and unstratified deposit of gravel, sand, silt, clay, with boulders/cobbles possible. Described as a mass-wasting deposit at the base of steep hillslopes and cliffs as part of a slump or hillslope failure. Found along stream beds where undercutting of the hillslope has occurred under diamict deposits causing rotational failures.

The unit is an admixture of unsorted sediment ranging from clay to boulders. Generally, clast supported, massive and clast rich. Interpreted as till. In this quadrangle identified moraines are comprised of clast supported till ranging from gravel rich in some cases showing hummocky topography just north of State Route 79.

Sand and gravel deposits were found in the lower lying valleys along brook or damcreek. These deposits are either fluvial in origin (Psg) or deposits that occurred beneath or adjacent to the ice sheet (Psd). The sand and gravel deposits were found atop Stratford Route 79 and represent the retreat out of the quadrangle to the northwest. Other occurrences are found in the Richford Valley and represent the retreat of the ice sheet northward. One of these deposits lies just north of the Town of Berkshire has remnant braided stream channels features on its surface. These deposits consist of most medium sand with smaller percentages of coarse/sand and medium to coarse gravel with an occasional boulder. The largest deposit of sand and gravel is in the northern and eastern portion of the quadrangle. This deposit is a glacial outwash deposit in a subglacial river system beneath the ice sheet. It is a sinuous ridge of well-sorted, coarse grained sand and gravel. The sediment found in this deposit ranges from medium sand to cobbles and boulders that are subrounded to well-rounded in shape. The higher percentage of coarser grain materials is due to its proximity to the ice-margin and higher energy flow of meltwater in these regions.

Legend:

- Streets
- Highways
- Railroads
- County Line
- Water Bodies
- Streams
- Contours
- Cross-Section Line
- NYSDEC Water Well Location
- NYSDOT Boring Location
- Eskers
- Ice Margin
- NYSGS Soil Sample Location

Statewide View

County View

Tompkins

Tioga

Dryden	Harford	Marathon
Speedsville	Richford	Lisle
Candor	Newark Valley	Maine

Shaded relief generated from 2008 Tompkins County Soil and Water Conservation District 2-meter lidar set, the 2012 Seneca Watershed 2-meter, and the 2000 NYS 10-meter lidar set by the United States Geological Survey.

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