

**Description of Map Units**

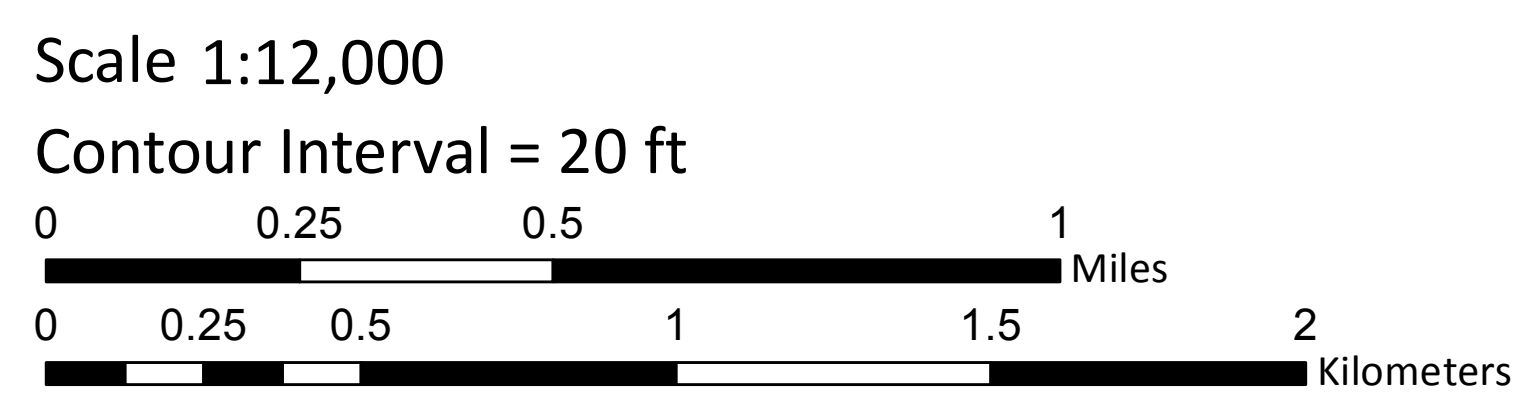
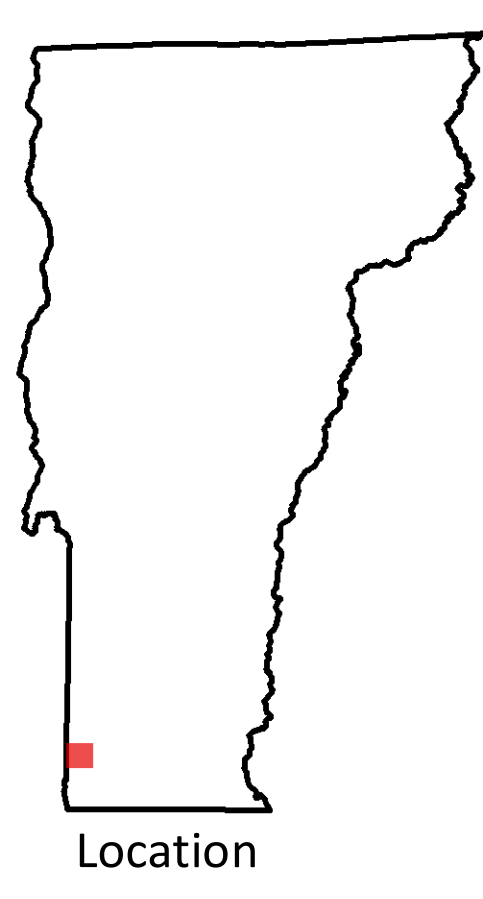
- Recent**
- ar** Artificial Fill. Variable materials used as artificial fill along rail beds, road beds, embankments and low lying areas. Large areas of fill are commonly shown on the map. Small areas of fill and areas along rail lines are not shown.
- Holocene**
- Hmp** Muck-Peat. Organic sediment. Primarily silt and clay in wetlands and swamps. Deposits are located in low lying flat lands that are prone to flooding.
  - Hal** Alluvium. Fine sand, silt and gravel, stream flood plain deposits of river channel, bar, and overbank areas. Deposits usually have intermediate to low permeability but can be a good aquifer if sufficiently thick. Surface sediment may be poorly drained overbank silt or well drained channel and bar sand and gravel.
  - Haf** Alluvial Fan. Gravel, silt and sand, often poorly sorted, includes diamicton. Moderately sloping tributary stream deposits located at the base of steep slopes and at stream junctions. Deposits usually have intermediate to low permeability but can be a fair aquifer if sufficiently thick and permeable.
- Holocene/Pleistocene**
- HPft** Fluvial Terrace. Fine sand, silt and gravel generally less than 5 meters thick overlying other material. Flat to gently sloping old flood plain deposits. Deposits have variable permeability but usually intermediate. Usually serve as a fair aquifer. Banks above streams may be prone to failure.
- Pleistocene**
- Pic** Lake Clay-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. Deposits are poorly drained and form an aquitard to an aquiclude. Deposits are also prone to landsliding and gullying.
  - Pif** Inwash Fan. Stratified fluvial sand, sand and gravel, or gravel. Deposited in topographic setting similar to alluvial fans but lower distal position was glacial ice and not solid ground. Deposits are well drained and, if thick, a good unconfined aquifer.
  - Pow** Outwash. Well sorted gravel and sand typically greater than 5 meters thick. Deposits form gently sloping to flat lands which may be pitted due to melted ice blocks. Deposits have intermediate to high permeability and are an excellent aquifer with high gravel-sand resource potential.
  - Pk** Kame. Stratified and unstratified sand, gravel and boulders with variable silt. Deposits form undifferentiated hummocky terrain. Comprised of glacial deposits from streams, slumps, and deposition by ice. Deposits have intermediate to high permeability, high gravel-sand resource potential, and are a fair to good unconfined aquifer, limited by variable thickness and aerial extent, which may be recharge to confined aquifer on valley floor.
  - Pkt** Kame Terrace. Stratified and unstratified gravel, sand, boulders and some silty sand with gravel. Ice contact melt water and sediment flow deposits that typically exceed 10 meters in thickness and form flat to nearly flat lands. Deposits have intermediate to high permeability and serve as an excellent unconfined aquifer that may be recharge to the valley floor confined aquifer. Deposits also have high gravel-sand resource potential, and slopes at edges of these areas may pose a stability problem.
  - Pkm** Kame Moraine. Stratified and unstratified gravel and sand with silt and boulders. Ice contact melt water and sediment flow deposits that form rolling, hilly ridged lands with local flat areas. Deposits have intermediate to high permeability, high gravel-sand resource potential, and local steep slopes pose a slope stability problem.
  - Pgm** Ground Moraine. Hummocky till with sand and gravel ranging from stratified and well-sorted gravel and sand to unstratified and poorly sorted silt, sand, gravel and boulders (diamicton). Ice contact sediment flow, meltwater, and ice deposited sediments of variable texture that may form gently rolling or elongate hills. Deposits have low to high permeability and limited local slope stability problems.
  - Pm** Moraine. Unstratified and stratified silt, sand, gravel and boulders that may form a ridged or smoothly undulating landform. Ice contact, ice deposited, sediment flow, and meltwater deposited materials that form broad ridges and swales with rolling low hills. Deposits have variable permeability and local slopes may pose a stability problem.
  - Pt** Till. Ice-derived, unsorted, and unstratified hardpan silt, boulders, gravel and sand greater than 3 meters in thickness. Material was deposited beneath the glacier and may contain deformed stratified units that may be re-deposited diamictons from subaqueous or subglacial flows. Deposits form smoothed and streamlined hills and drumlins in the valley and gently undulating slopes on the lower mountain flanks, to nearly flat plains dotted with erratics. Deposits have low permeability and retard infiltration to bedrock aquifer. Slopes are often unstable in excavations and prone to significant slope failures along stream banks.
  - Ptt** Thin Till. Ice-derived, unsorted, and unstratified hardpan silt, boulders, gravel and sand less than 3 meters thick with rock outcrops or ledge frequent. Surface boulders or erratics are common. Deposits are located on moderate to steep mountain slopes and summit areas. Deposits have low permeability; however, soil formation typically improves permeability and enables recharge to bedrock aquifer. Steep slopes are unstable and slides are common.
- Pre-Pleistocene**
- sap** Saprolite. Deeply, thoroughly weathered bedrock altered under climatic conditions much different than today. Saprolite was observed along the Wallouasco River in several exposures opened up by Hurricane Irene. Slumping has covered some of these preserved weathering profiles.
  - R** Rock Outcrop. Areas of predominantly outcrop with patches of till or slump or slide debris. Outcrop areas serve to recharge bedrock units with groundwater. Slopes are generally stable except steep slopes where rock slides and rock falls may occur.

**Description of Map Symbols**

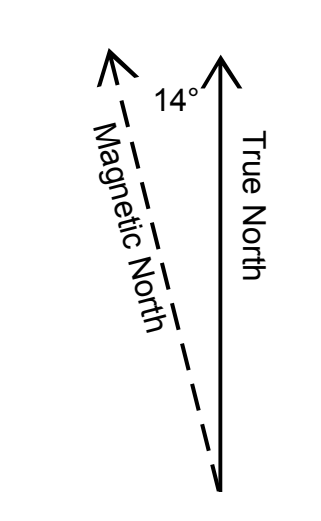
- Field Locations (Bedrock Outcrops)
- Field Locations
- Area Analyzed for Recharge Potential
- Town Boundaries
- Lakes/Ponds
- Rivers
- Cross-Sections

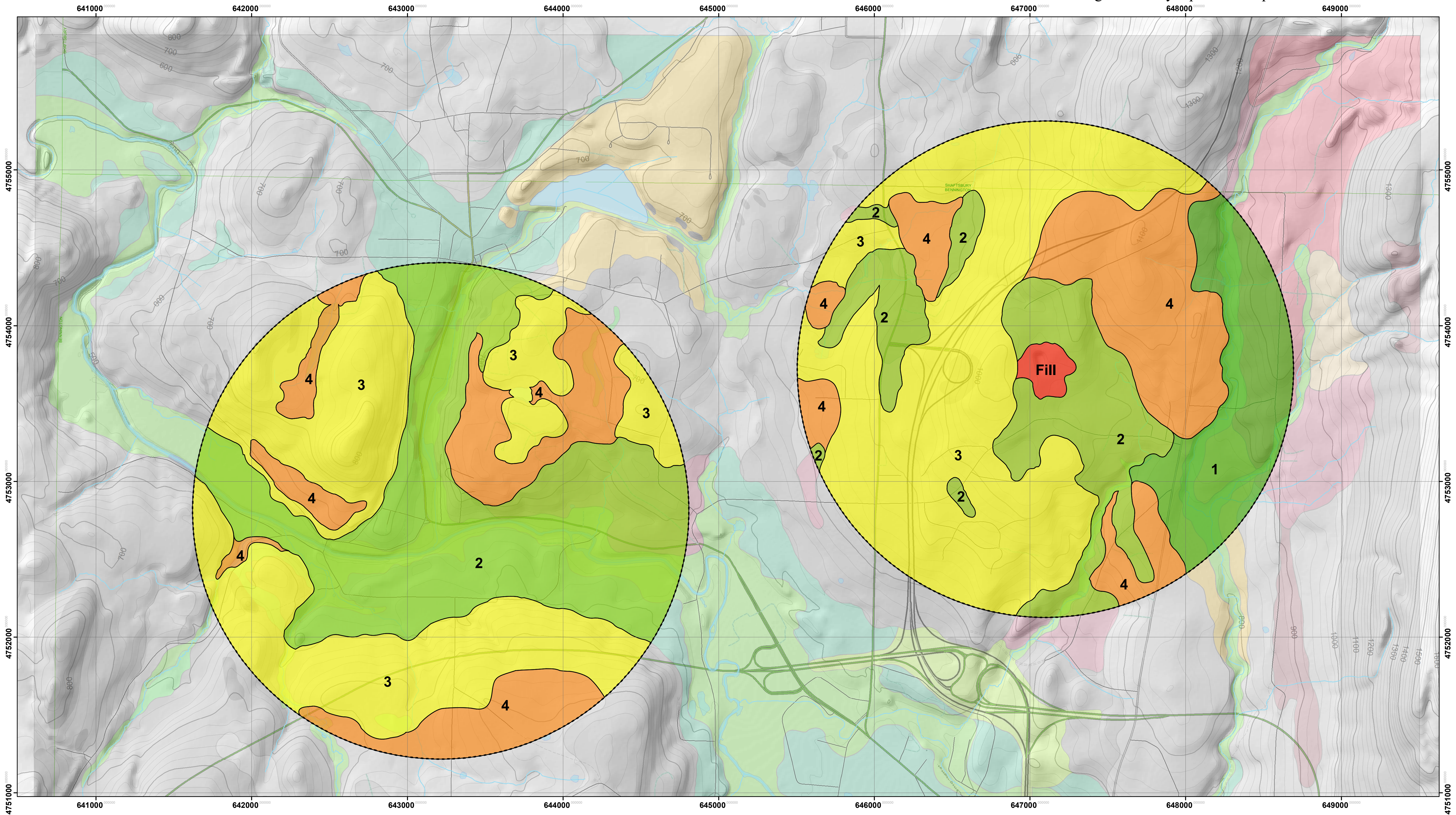
# Surficial Geologic Map of the Bennington Area, Vermont

Vermont Geological Survey Open File Report VG2017-1: Plate 1



David J. DeSimone, PhD  
2017





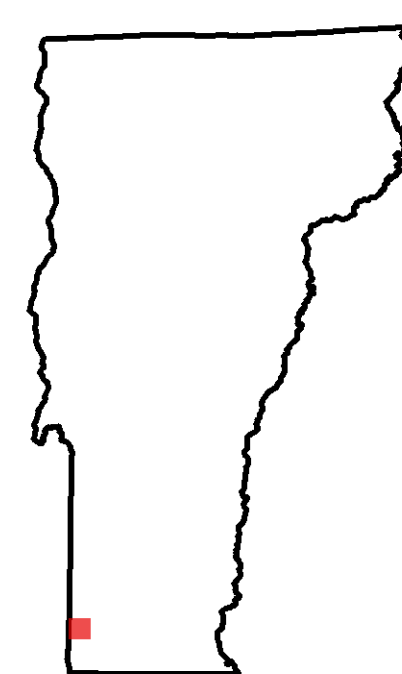
**Recharge Potential**

- Highest
- 1** Areas of highly permeable overburden that are believed to be comparatively thick and persistent based upon well logs and the character of the deposits. The extensive kame moraine and outwash with adjacent kamic areas have the highest potential to recharge the bedrock aquifer. A kame moraine consists of predominantly fluvial sediment that may have lenses and interbeds of low permeability till that are typically not laterally extensive. Outwash is a highly permeable fluvial deposit of gravel and sand with little or no impermeable sediment. Adjacent kamic deposits may have both permeable and impermeable interbedded sediments.
  - 2** Areas of intermediately permeable materials including kamic sediment, outwash, moraine, eroded till, fluvial terraces and alluvium. The kamic areas are likely the most permeable sediment of this category and consist largely of gravel and sand. The area of outwash included in this group has an unknown thickness and may overlie bedrock or till. The small morainal feature is not well expressed and may be more kame moraine in sediment texture. Eroded till punctuated by several bedrock exposures suggests comparatively easy recharge to the bedrock aquifer. Fluvial terraces and alluvium consist of gravel, sand and silt in variable proportions with highly variable surface layer permeability.
  - 3** Areas of thin till overlying bedrock. The upper meter or so of the till is typically weathered to a more permeable texture than the underlying till. Weathered till should allow water infiltration to bedrock more easily than unweathered till. The process of soil formation oxidizes and alters the upper meter or so of the sediment and thinner areas of till may be weathered throughout the sediment profile. In addition, this group includes small rock outcrops within areas of till.
  - 4** Areas of thick impermeable till. Thick till has a thicker profile of unweathered till beneath the soil zone than weathered till. Unweathered till has an extremely low permeability and low recharge potential. A small area of exposed glacial lake clay-silt is also assigned to this category as clay-silt has a very low permeability.
- Lowest

# Aquifer Recharge Potential as a Function of Surficial Materials in the Bennington Area, Vermont

Vermont Geological Survey Open File Report VG2017-1: Plate 2

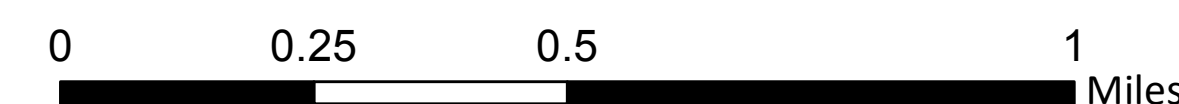
David J. DeSimone, PhD  
2017



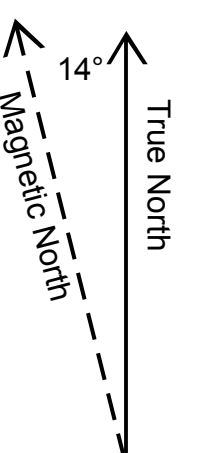
Location

Scale 1:12,000

Contour Interval = 20 ft

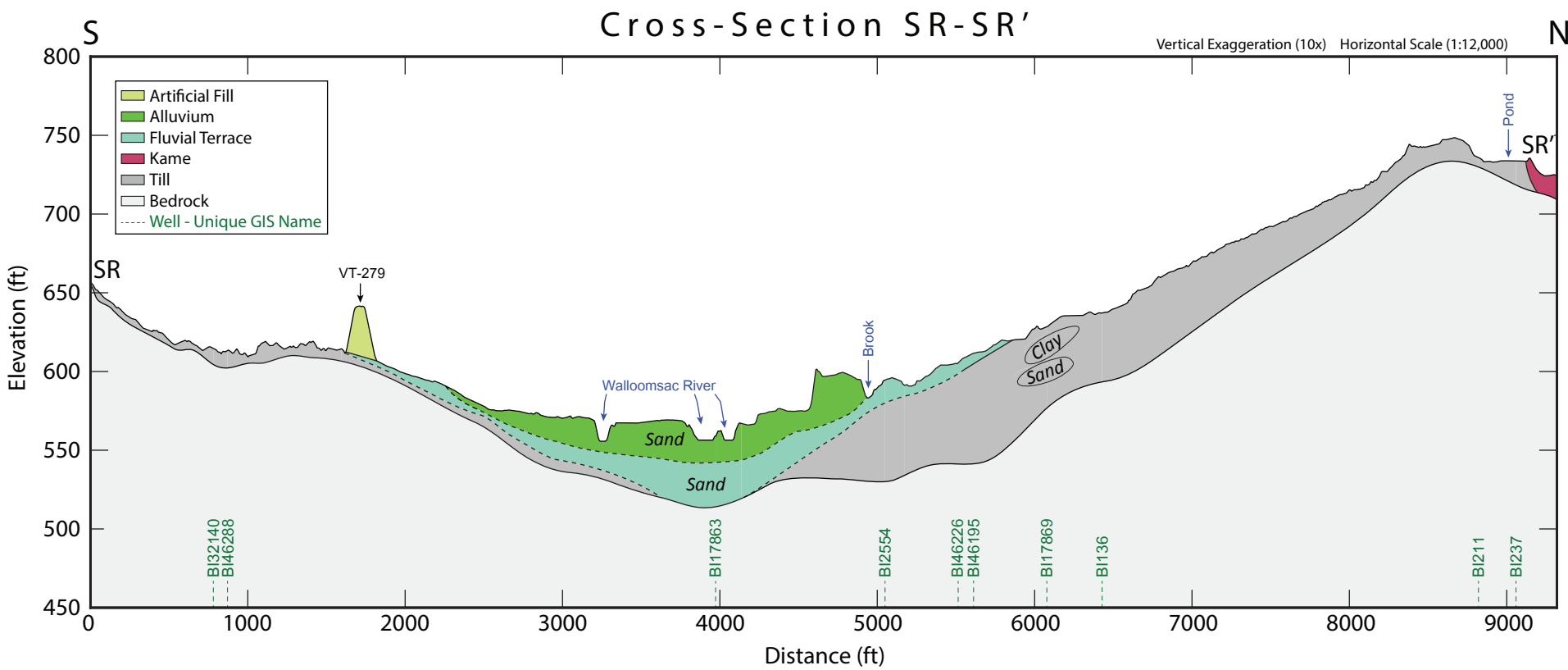
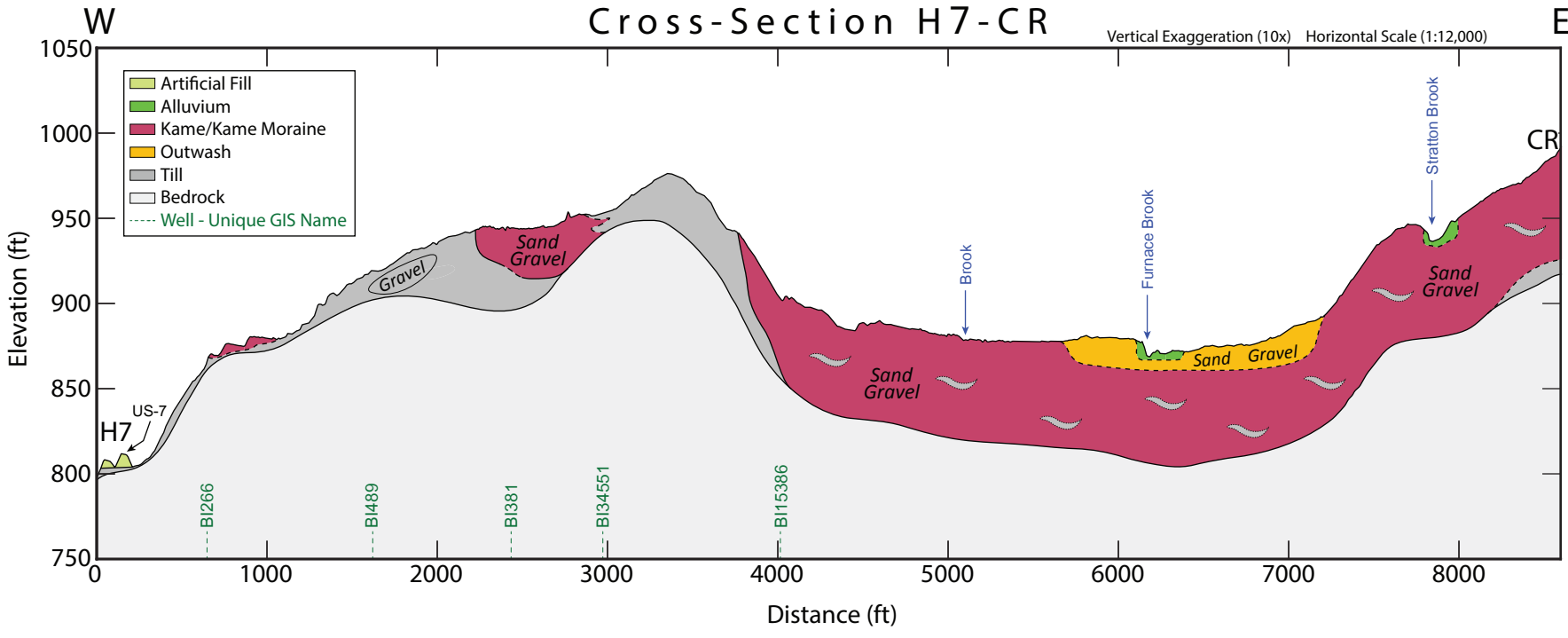
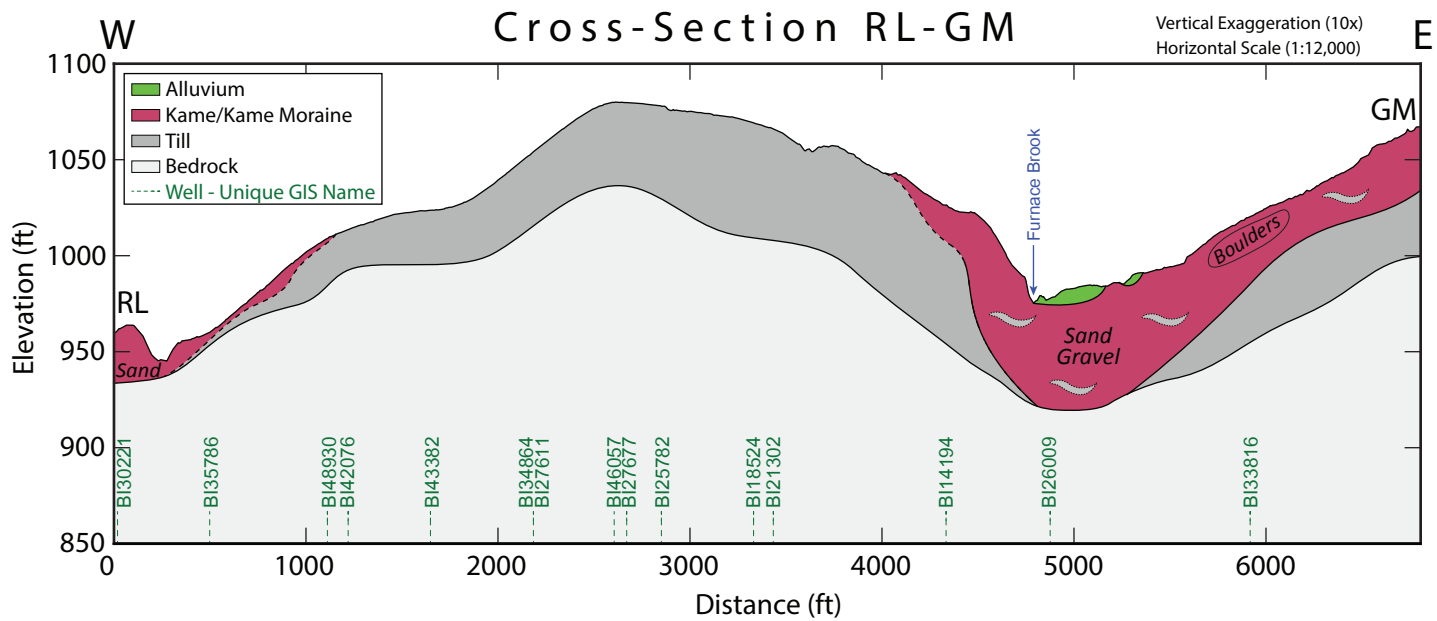


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Digital Cartography by Colin Dowey



# Surficial Geology of the Bennington Area, Vermont: Cross Sections

Authors: David J. DeSimone, PhD and Colin Dowe



Land surface elevation derived from VT Lidar Hydro-flattened DEM (2 meter) - 2012 - Bennington from the Vermont Center for Geographic Information. Bedrock surface elevation derived from Lidar Data, Outcrop Locations, and Well Completion Reports.

