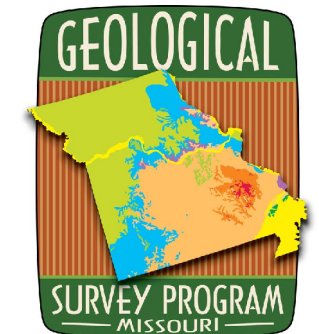
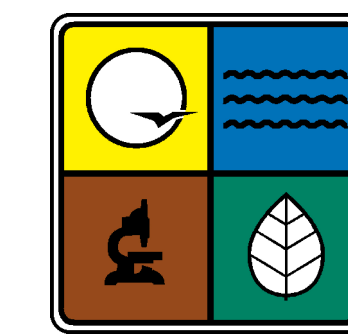


**SURFICIAL MATERIAL GEOLOGIC MAP OF THE ST. CHARLES 7.5' QUADRANGLE  
ST. CHARLES AND ST. LOUIS COUNTIES, MISSOURI**

**Geology and Digital Compilation by  
David A. Gaunt and Bradley A. Mitchell**

2011

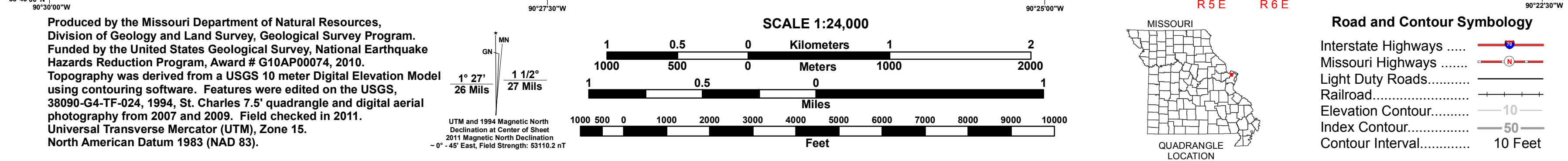
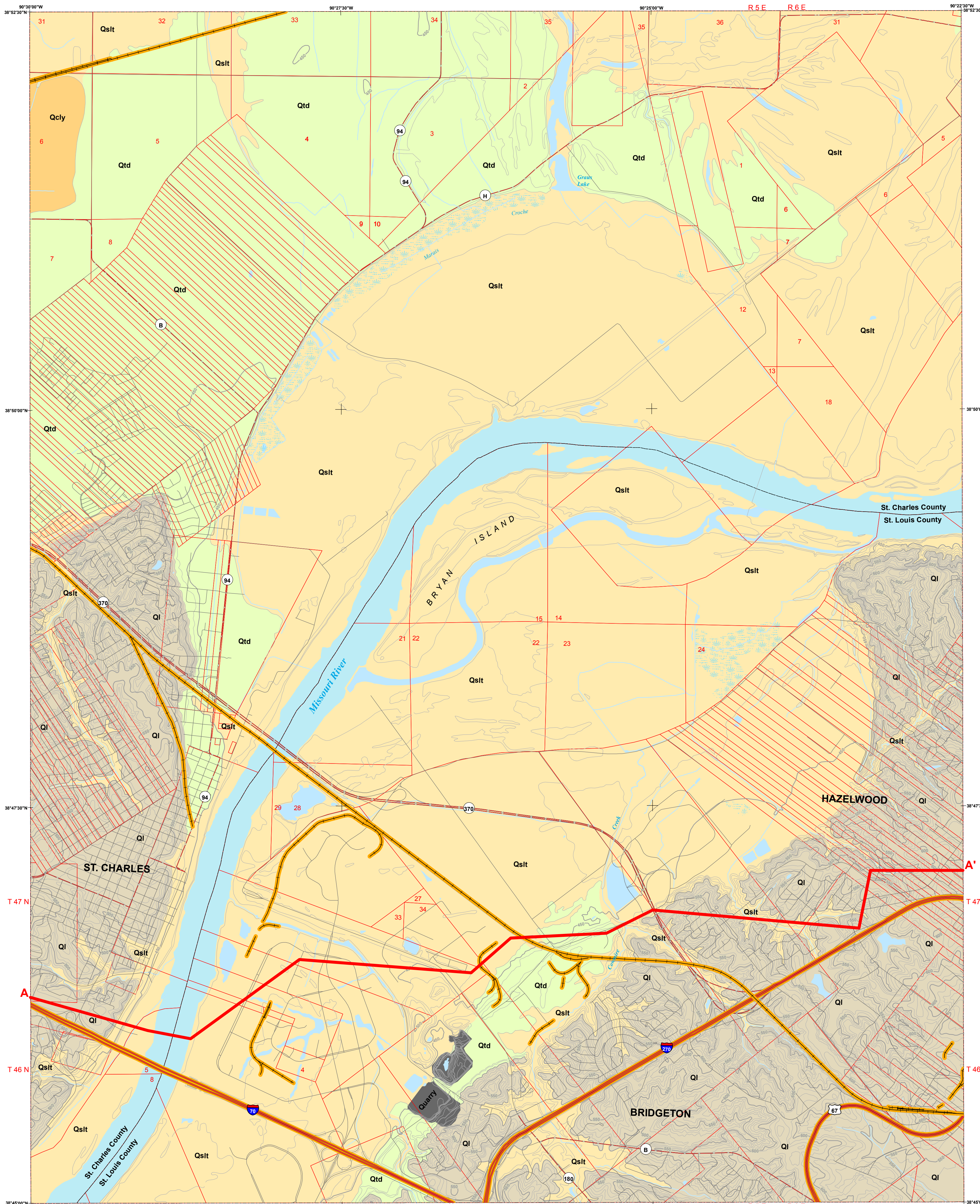
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**THIS MAP WAS PRODUCED UNDER A COOPERATIVE  
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SURVEY**

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**PHYSIOGRAPHY**

The St. Charles quadrangle includes part of the large floodplain of the Missouri River and loess covered uplands. The floodplain is up to five miles wide in this area. The quadrangle lies within the Dissected Till Plains Section of the Central Lowland Province of the Interior Plains Physiographic Division. With the exception of a quarry located in the south of the quadrangle, the lowest recorded elevation is slightly less than 420 feet mean sea level (msl) and occurs along the edge of the Missouri River near the eastern quadrangle boundary. The highest elevation on the quadrangle occurs on the loess covered uplands and is greater than 650 feet msl in the southeast corner of the quadrangle. Total relief on the St. Charles quadrangle is approximately 230 feet.

**GEOLOGICAL OVERVIEW**

The St. Charles quadrangle is underlain by Paleozoic limestone and shale. The majority of the quadrangle is underlain by the Mississippian-age St. Louis, Salem and Warsaw Formations. The upland area in the southeast of the St. Charles quadrangle contains the Pennsylvanian-age Cherokee and Marmaton Groups which are cyclic Desmoinesian Series deposits of shale, limestone, sandstone, clay and coal. In areas where surficial materials overlie the Warsaw Formation, the landslide potential is greater. The Warsaw Formation is dominated by shale, which creates a zone of instability during high precipitation events.

**DESCRIPTION OF MAP UNITS**

- Qcly** **QUATERNARY CLAY-CAPPED ALLUVIUM** – This unit has been deposited by the Missouri River. The approximate upper 15 feet of these deposits are composed predominantly of clay with variable amounts of silt and organic material. The material residing below the clay is predominantly sand and gravel to the top of bedrock. The thickness of this unit ranges from 80 to 100 feet. The water table is approximately five to 15 feet below ground surface, resulting in an interval of saturated sand and gravel greater than 80 feet thick.
- Qsilt** **QUATERNARY SILT-CAPPED ALLUVIUM** – This unit has been deposited by the Missouri River. The approximate upper 15 feet of these deposits are composed predominantly of clay with variable amounts of silt and organic material. The material residing below the clay is predominantly sand and gravel to the top of bedrock. The thickness of this unit ranges from approximately 20 feet where the floodplain transitions to uplands to more than 120 feet where the Missouri River has incised the Paleozoic bedrock. The water table is approximately five to 15 feet below ground surface, resulting in an interval of saturated sand and gravel more than 100 feet thick. This unit is included in the cross sections as Quaternary silt-capped alluvium.
- Ql** **QUATERNARY LOESS** – This unit is a wind-blown deposit of silt and clayey silt with occasional pockets of clay, sand and gravel. The unit is composed of two separate loess layers, the Roxana below and the Peoria above (Goodfield, 1965). The total thickness of the two units may reach 140 feet. The Roxana is higher in clay content and may have a paleosol developed in the upper few feet. The contact between the two units forms a potential slide plane in areas of high topographic relief. The loess overlies Mississippian-age bedrock comprised of limestone and shale creating two unique environments. Where the loess is thin, the limestone may be karstic. Where the underlying unit is predominantly shale, water will perch, destabilizing the contact zone. Where the loess rests upon shale, the slide potential is increased.
- Qtd** **QUATERNARY TERRACE DEPOSIT** – The terrace deposits in the quadrangle are slightly different than previously mapped terrace deposits (Brill, 1991; Harrison, 1997; and Goodfield, 1965). All were deposited during fluvial events, leaving the terrace above low flow stage of the river. However, the terrace deposits in this quadrangle have a lacustrine signature of sensitive organic clays approximately 20 feet below the surface. After high stage flow returned to normal, low lying areas within the terrace were filled with organic clay material. This zone has a very low shear wave velocity and underlies many types of infrastructure.

- A — A'** Line locates the placement of the cross section with end line symbols.
- Public Land Survey System including Spanish land grants.

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