

Wisconsin Geological and Natural History Survey
Bulletin 101
Geology of La Crosse County, Wisconsin
Plate 1

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Explanation

Organic material
Organic material (peat and muck) in varying degrees of decomposition; approximately 1 to several feet thick; dark brown to black where saturated; medium to dark brown where unsaturated due to tiling; found generally within areas of modern stream sediment in nonglacial stream valleys and on lowermost slopes of hillslope sediment; deposited during the Holocene.

Windblown sediment
Very fine- and fine-grained sand and coarse-grained silt; deposited during the Late Pleistocene. Unit **ws**: Sand, forming distinctive dunes up to 40 ft high; dune landscapes were formed on Late Pleistocene sand and gravelly sand terraces. Unit **wz**: Coarse-grained silt (loess), up to 2 ft thick in low-relief upland areas, except where local topography permits greater thickness; maximum observed thickness is about 30 ft; found south of West Salem, where loess is thick and distinctive paha topography is present.

Hillslope sediment
Silty to gravelly material, depending on nature of material moved downslope due to mass wasting processes; a few feet to several feet thick; yellow to reddish yellow; poorly sorted; found along toeslopes of bedrock ridges; deposited primarily during the Late Pleistocene, but minor deposition continues.

Ponded sediment
Clay, silty clay, and clayey silt; ranging from 3 to 9 ft thick; ranges from light olive brown to reddish brown; found on fine-grained sand of high terraces of nonglacial streams; overlain by silt (loess) in places; deposited during the Late Pleistocene.

Holocene stream sediment
Fine- to medium-grained sand; slightly gravelly in places; includes extensive areas of marshlands along the Black and Mississippi Rivers; includes small areas of peat and muck; deposited primarily during the late Holocene.

Pleistocene and Holocene nonglacial stream sediment
Very fine- to fine-grained sand; includes two distinctive terrace surfaces distinguished by their relative elevation and the presence of cutbanks; deposited mainly during Late Pleistocene and early Holocene. Unit **sf**: Alluvial fan deposits; fine- to medium-grained sand; poorly to moderately sorted; forms a conical or fan-shaped land surface at mouth of Halfway Creek; fills lowland between the high terrace near Holmen and the low terrace surface to the southwest. Unit **sb**: Unnamed low terrace surface. Unit **sa**: Unnamed high terrace surface.

Pleistocene glacial meltwater stream sediment
Gravelly sand, slightly gravelly sand, and sand; dominantly quartz and feldspar with minor amounts of igneous and metamorphic rock fragments; forms broad terrace surfaces along the Black and Mississippi Rivers that are distinguished primarily on the basis of their elevation; deposited during Late Pleistocene. Unit **sl**: Low terrace surfaces from Brice Prairie (north; elevation approximately 680 ft) to Goose Island (south; elevation approximately 635 ft); gravel content up to 9 percent. Unit **si**: Intermediate terrace surface in the city of La Crosse area, gravel content up to 15 percent; elevation ranges from 675 ft (north) to 645 ft (south). Unit **sh**: High terrace surface known as Amsterdam Prairie; gravel content up to 15 percent; elevation ranges from 725 ft (north of New Amsterdam) to 700 ft (south of Onalaska).

ANCELL GROUP
St. Peter Formation
Fine- to medium-grained quartz sandstone; unknown thickness due to limited exposure in county (single outcrop west of Middle Ridge in southeastern part of county); lower contact not visible because of poor exposure; upper contact extensively covered by vegetation and weathered rock and sediment; Middle Ordovician.

PRAIRIE DU CHIEN GROUP
Oneota and Shakopee Formations, undifferentiated
Fine- to medium-crystalline, thin- to thick-bedded, pale gray to light brownish-gray dolomite (chert rich in places), sandy dolomite, and dolomitic sandstone; from 140 to more than 250 ft thick; forms near-vertical slopes along edge of broad uplands, which are flat to gently rolling away from the edge of the ridges in the south part of the county; caps narrow ridgetops in the north part of the county; Lower Ordovician. Shakopee Formation: Willow River Member, sandy dolomite and dolomite, stromatolitic in places. New Richmond Member, dolomitic and quartz-rich sandstone. Oneota Formation: Hager City Member, dolomite, stromatolitic in places. Stockton Hill Member, dolomitic sandstone, silty and sandy dolomite, and dolomite. Included in this map unit are areas of Rountree Formation, which is not a part of the Prairie du Chien Group: red to red-brown clay, clayey silt, and coarse silt with granules to pebbles of chert and dolomite rock; from a few to several tens of feet thick.

TREMPEALEAU GROUP
Jordan Formation
Medium-grained, light brown to brownish-yellow, moderately sorted, quartz sandstone; from 100 to 160 ft thick; forms steep, near-vertical slopes; Late Cambrian (Trempealeuan). Van Oser Member, large sets of wedge-shaped cross-stratified quartz sandstone; 80 to 120 ft thick; contact with Stockton Hill Member of Oneota Formation is abrupt at change from cross-bedded Van Oser sandstone to horizontally bedded silty and sandy dolomite of the Stockton Hill. Norwalk Member, fine-grained feldspathic sandstone, extensively covered by vegetation; horizontally bedded; 20 to 30 ft thick; contact with the St. Lawrence Formation dolomitic siltstone is not exposed.

TUNNEL CITY GROUP
Lone Rock Formation
Very fine- to fine-grained, glauconitic, thin- to medium-bedded, horizontally bedded, light brown to green-brown sandstone; from 100 to 200 ft thick; forms broad, gently sloping land surface extensively covered by vegetation; lower contact with Wonewoc Formation is gradational and not well exposed; upper contact with St. Lawrence dolomitic siltstone is gradational and covered; Late Cambrian (Franconian).

ELK MOUND GROUP
Wonewoc Formation
Fine- to medium-grained, brownish-yellow to yellow, moderately sorted quartz sandstone displaying medium- to large-scale cross-stratification; from 140 to 280 ft thick; forms steep, near-vertical slopes, with less steep rolling topography at contact with unit **hu** along toeslopes of outcrops; lower contact with Eau Claire Formation not exposed in county; upper contact is a gradational change to glauconitic, fine-grained sandstone of the Lone Rock Formation; Late Cambrian (Dresbachian). Ironton Member, medium- to coarse-grained, buff to reddish-brown, poorly sorted, well cemented sandstone. Galesville Member, medium-grained, white to buff colored, well sorted, weakly cemented sandstone.

Eau Claire Formation
Very fine- to fine-grained, thin- to medium-bedded, brown to pale brown sandstone; isolated exposures are a maximum of 20 ft thick at outcrops immediately west of Neshonoc Lake, but total thickness not determined due to lack of exposure of bottom contact; contact with overlying Wonewoc Formation not exposed; Late Cambrian (Dresbachian).

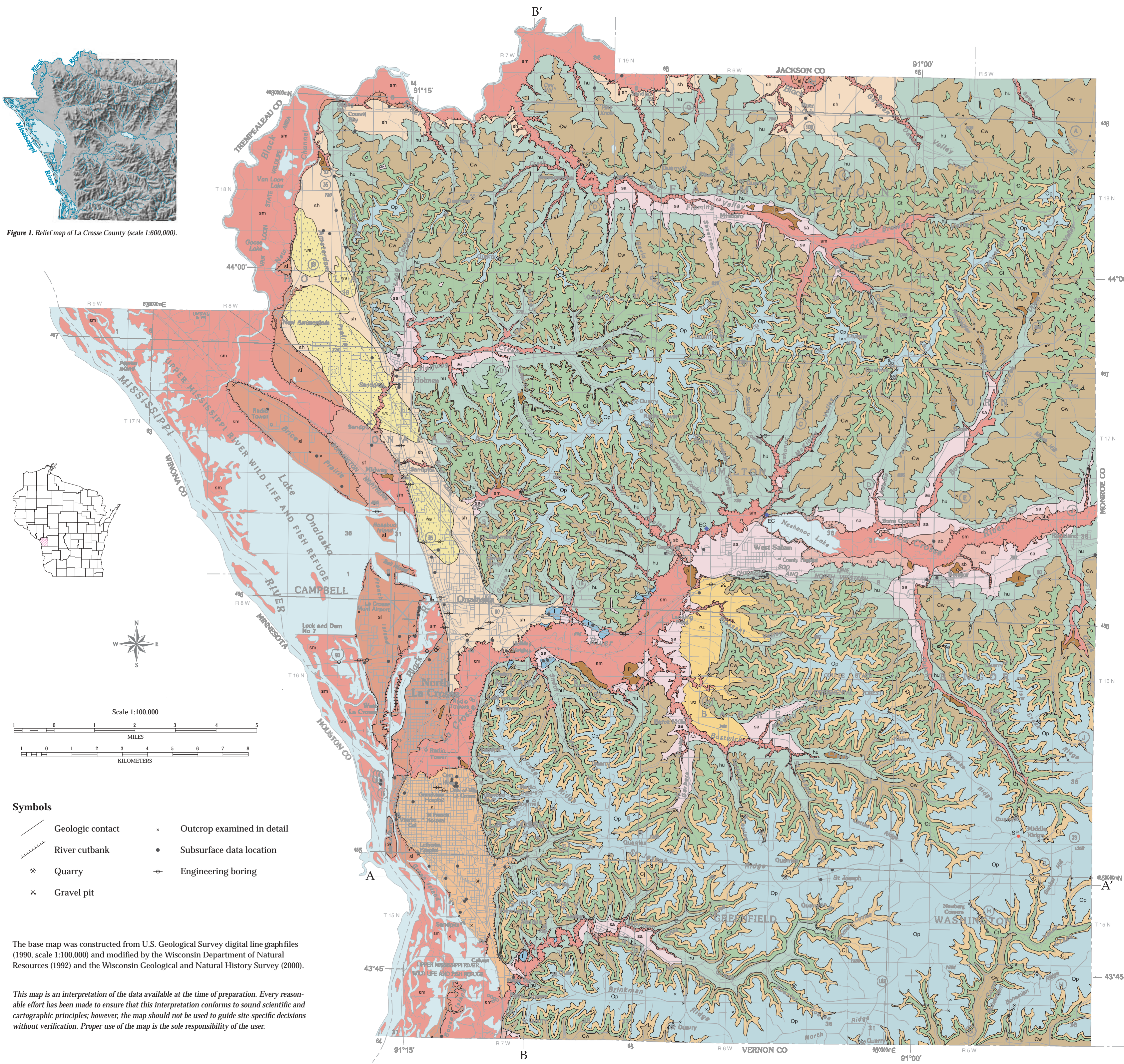


Figure 1. Relief map of La Crosse County (scale 1:600,000).

Symbols

- Geologic contact
- River cutbank
- Quarry
- Gravel pit
- Outcrop examined in detail
- Subsurface data location
- Engineering boring

The base map was constructed from U.S. Geological Survey digital line graph files (1990, scale 1:100,000) and modified by the Wisconsin Department of Natural Resources (1992) and the Wisconsin Geological and Natural History Survey (2000).

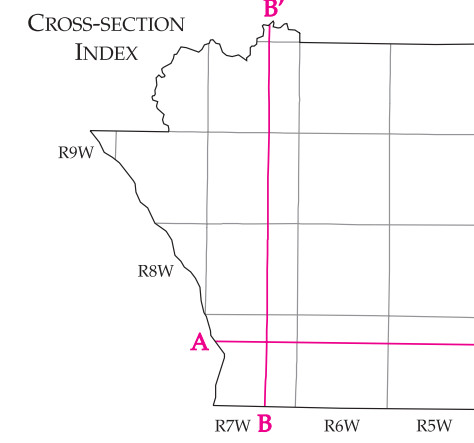
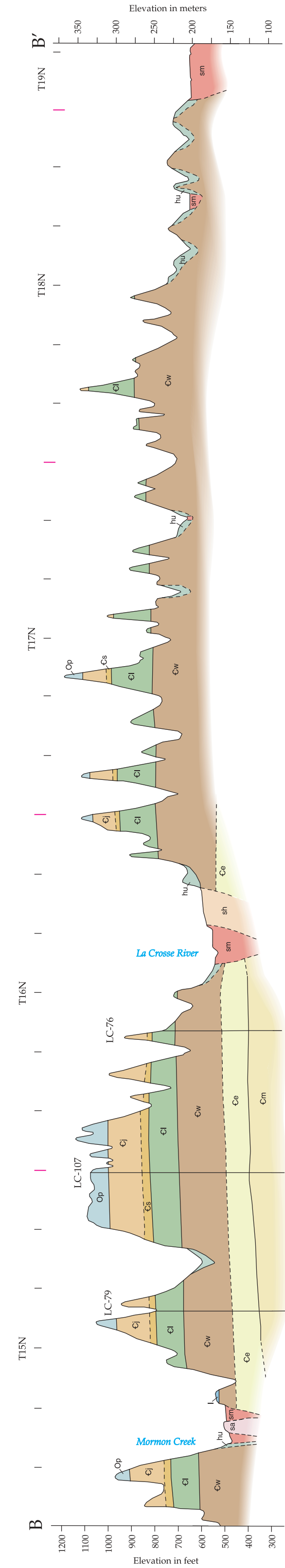
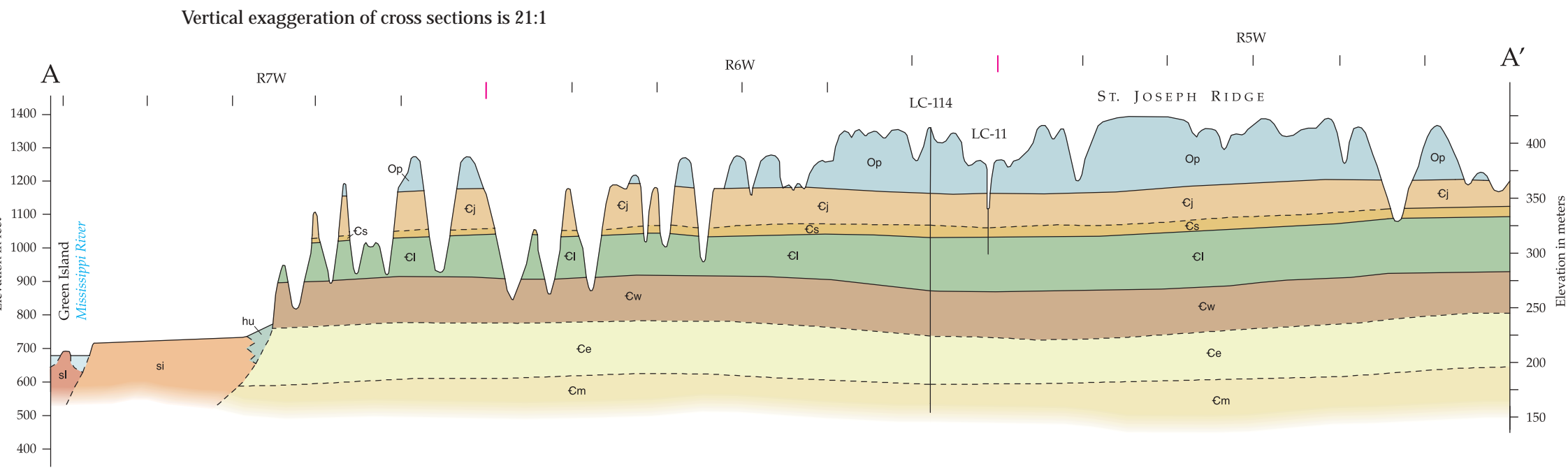
This map is an interpretation of the data available at the time of preparation. Every reasonable effort has been made to ensure that this interpretation conforms to sound scientific and cartographic principles; however, the map should not be used to guide site-specific decisions without verification. Proper use of the map is the sole responsibility of the user.

Cross-section explanation

- Hillslope sediment
- Ponded sediment
- Holocene stream sediment
- Pleistocene and Holocene nonglacial stream sediment (high terrace)
- Pleistocene glacial meltwater stream sediment (low terrace)
- Pleistocene glacial meltwater stream sediment (intermediate terrace)
- Pleistocene glacial meltwater stream sediment (high terrace)
- Contact, dashed where inferred
- Well

PRAIRIE DU CHIEN GROUP
Op Oneota and Shakopee Formations, undifferentiated

- TREMPEALEAU GROUP**
Cj Jordan Formation
Cs St. Lawrence Formation
Cl Lone Rock Formation
- ELK MOUND GROUP**
Cw Wonewoc Formation
Ce Eau Claire Formation
Cm Mount Simon Formation



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PLATE 1. GEOLOGIC MAP AND CROSS SECTIONS OF LA CROSSE COUNTY, WISCONSIN.