SURFICIAL GEOLOGY OF PLEASANT MOUND QUADRANGLE
BOND AND FAYETTE COUNTIES, ILLINOIS

Prairie Research Institute
ILLINOIS STATE GEOLOGICAL SURVEY

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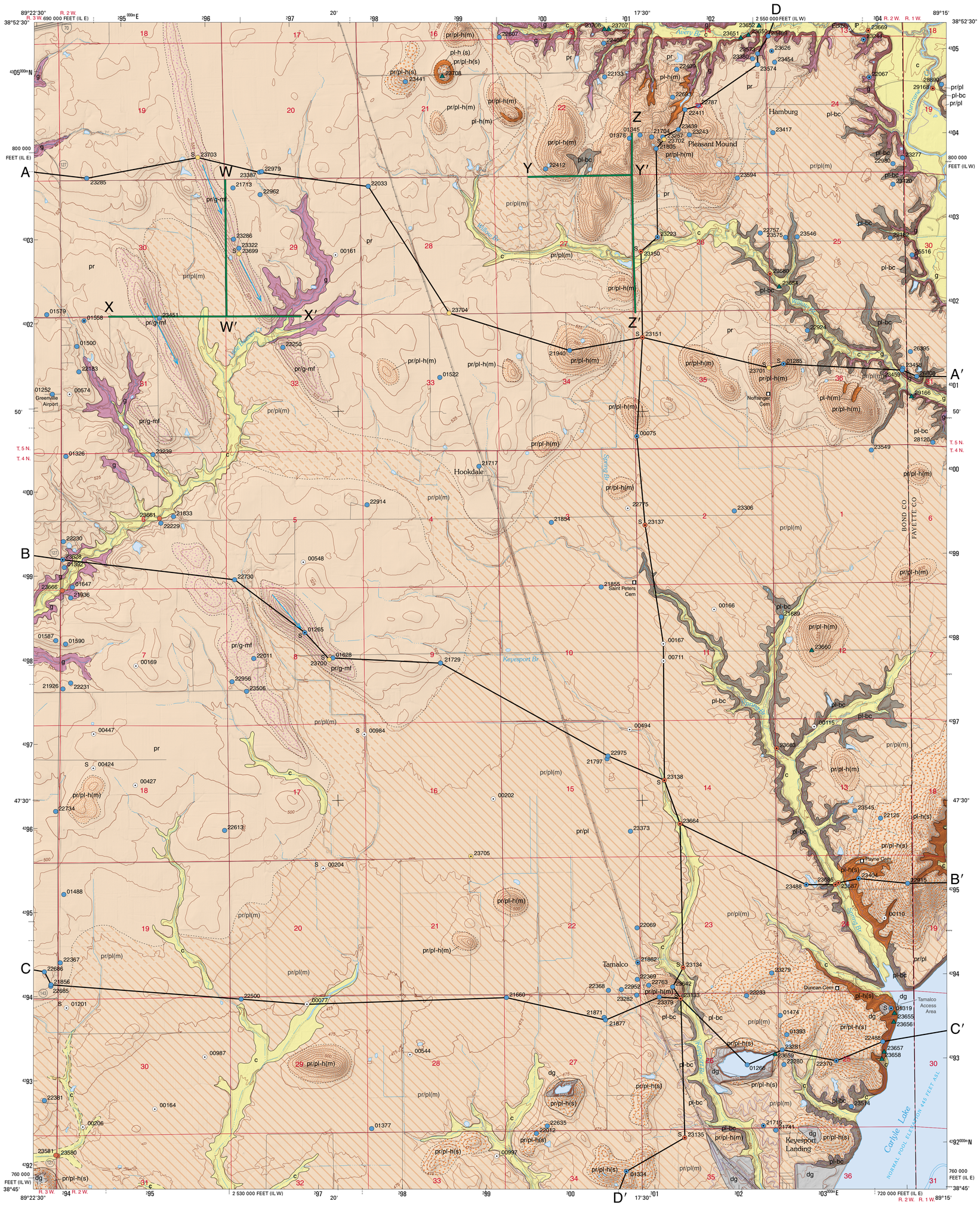
2018

STATEMAP Pleasant Mound-SG



QUATERNARY DEPOSITS

Description	Unit	Interpretation
HUDSON EPISODE (~12,000 years before present [B.P.] to today)[1]		
Fill or removed earth; includes overburden material from sand and gravel mining, areas disturbed from mining, and compacted earth materials in road and railway embankments; up to 30 ft thick	Disturbed ground dg	**Anthropogenic fill or excavations**; includes areas of former sand and gravel pits in southern part of the quadrangle and railway embankments in the southeastern quadrangle area
Silt loam (mainly) to silty clay loam to sandy loam; may contain thin sandy or loamy zones, especially in lower part; dark brown to grayish brown to very dark gray; massive to weakly stratified; noncalcareous; soft consistency; weak and thin modern soil profile is typical (<1 ft); localized beds with organics; up to 25 ft thick	Cahokia Formation c	**Alluvium (river deposits), overbank or channel deposits**; in floodplains of Hurricane Creek, Avery Creek, Little Beaver Creek, Willow Branch, Spring Branch, Keyesport Branch, Flat Branch, and other unnamed tributaries to the former Kaskaskia River; occurs in subsurface below Carlyle Lake (former Kaskaskia River Valley); derived mainly from erosion of loess, till, and outwash sediments in adjacent uplands and slopes; includes some historical deposition
WISCONSIN EPISODE (~60,000–12,000 years B.P.)		
Silt loam to silty clay loam; brown to dark yellowish brown to yellowish brown to grayish brown; contains a weak soil structure throughout but strong structure in modern soil solum (upper few feet); soft to moderately stiff; typically 5 to 6 ft thick	Peoria and Roxana Silts (>5 ft thick) pr	**Mainly loess (windblown silt) and redeposited loess**; Peoria Silt (upper unit) contains modern soil; the Roxana Silt (lower unit) is not easily distinguishable from the Peoria Silt in the field; the Roxana Silt is gradational with older units below
SANGAMON AND LATE ILLINOIS EPISODES (~150,000–60,000 years B.P.)		
Silty clay loam to clay loam to sandy clay loam; gray to light grayish brown to light olive brown to dark yellowish brown; mottled; rare to few pebbles; noncalcareous; strong soil structure and cutans in upper few feet of the unit; manganese and iron oxide stains; medium consistency; up to 15 ft thick	Berry Clay Member, Pearl or Glasford Formations pl-bc	**Accretionary deposits**, pedogenically mixed loess, lacustrine, ice-contact, and alluvial deposits; pedogenically altered, especially upper portions; attributed to the interglacial Sangamon Geosol; includes highly weathered portions of the Pearl and Glasford Formations (Illinois Episode); may also include Teneriffe Silt (loess, lacustrine sediment); occurs below the Peoria and Roxana Silts (loess) and within the upper part of the Pearl or Glasford Formations; mapped along slopes where eroded Peoria-Roxana loess cover is <5 ft thick
ILLINOIS EPISODE (~200,000–130,000 years B.P.)		
Fine sand to loamy sand to coarse sand with gravel; gravel content is mainly <20% and <2 cm in diameter; yellowish brown to grayish brown; sand is typically fine- to medium-grained; stratified below zone of alteration; typically weathered or more clayey in upper portions; moderately to well sorted; leached to calcareous; up to 40 ft thick	Pearl Formation (Mascoutah facies) (cross sections only) pl(m) (in subsurface) high confidence / low confidence	**Outwash**, deposited during ice-margin retreat; diagonal line pattern shown on loess-covered Illinois Episode terraces and outwash plains; upper portion contains alteration in the Sangamon Geosol solum; occurs in the subsurface beneath the Berry Clay Member or Cahokia Formation
Sand to loamy sand to gravelly sand; may contain loamy, silty, or diamicton beds; brown to yellowish brown to light olive brown; upper 5 to 10 feet is weathered to clay loam or sandy loam; otherwise loose to weakly cohesive; noncalcareous to calcareous (typically below ~ 30 ft depth); up to 85 ft thick	Hagarstown Member, Pearl Formation (sandy facies) pl-h(s) (in subsurface)	**Ice-contact sediment**, in glacial hills and ridges, mainly in the southeastern part of the quadrangle; includes eskerine or ice-walled channel deposits; may include kamic deposits, debris flows and melt-out deposits; upper portion contains alteration in the Sangamon Geosol solum; intertongues with the Mascoutah facies and the Glasford Formation; may be overlain by the Berry Clay Member and up to 6 feet of Peoria-Roxana loess
Intermixed sand, sandy loam, clay loam, silt loam, and diamicton; some gravelly zones; yellowish brown to grayish brown; massive to faintly or well stratified; generally more weathered or clayey in upper portions; noncalcareous to calcareous; up to 60 ft thick	Hagarstown Member, Pearl Formation (mixed facies) pl-h(m) (in subsurface)	**Ice-contact and supraglacial sediment**; in glacial hills and ridges; includes debris flows and melt-out deposits; upper portion contains alteration in the Sangamon Geosol solum; intertongues with the Mascoutah facies, Pearl Formation, and Glasford Formation; may be overlain by the Berry Clay Member and up to 6 feet of Peora-Roxana loess
Pebbly loam diamicton (Vandalia facies) **to silty clay loam diamicton** (Smithboro facies, lower unit); some sand and silt lenses; light olive brown to dark grayish brown to dark gray; contains ~ 2% to 8% pebbles, mainly less than 2 inches diameter; pebbles include sandstone, shale, dolomite, limestone, chert, coal, and granite; oxidized and iron stained along fracture faces; mainly calcareous, but leached in upper portions; Smithboro facies is a finer-grained lower unit (not always present) and contains fewer pebbles and common conifer wood fragments and silt inclusions; medium consistency (Smithboro facies) to very stiff and dense (Vandalia facies); generally massive, up to 65 ft thick	Glasford Formation g drumlins or megaflutes	**Till and ice-marginal sediment**; upper few feet of diamicton may contain Sangamon Geosol solum (mainly included in the Berry Clay Member); consists mainly of subglacial till (Vandalia facies) with some supraglacial and glaciofluvial sediments; a more fine-grained Smithboro facies (till with more wood fragments) occurs in subsurface in some areas; intertongues with the Pearl Formation; shown on the surficial geology map where is has <5 ft of loess cover; overlay pattern shown in areas of interpreted glacial streamlining (drumlins, megaflutes, subglacial lineations)
Fine sand to gravelly sand; may include beds of loamy sand or silt; typically <15% gravel; light olive brown to dark grayish brown; stratified; moderately to well sorted; loose to very weakly cemented; saturated; pebbles include clastics, carbonate, coal, and igneous types; calcareous; up to 35 ft thick	Grigg tongue, Pearl Formation (cross sections only) pl-g	**Outwash** (meltwater deposits); proglacial sedimentation during Illinois Episode glacial events; may be hydraulically connected to the Mascoutah facies or other tongues of the Pearl Formation; occurs as a basal tongue of outwash below the Glasford Formation
PRE-ILLINOIS EPISODE (~700,000–420,000 years B.P.)		
Silty clay loam to silty clay, dark greenish gray to light olive brown; rare small pebbles; mottled; gleyed; common iron oxide stains with a few manganese oxide stains; cumulic soil profile; cutans; vaguely laminated and minor amount of fine sand in lower few feet; medium consistency; sticky; noncalcareous to very weakly calcareous (near base of unit); up to 15 ft thick	Lierle Clay Member, Banner Formation (cross sections only) b-l	**Accretionary deposits**, pedogenically mixed loess, lacustrine, and alluvial deposits; strongly pedogenically altered; weathering attributed to the interglacial Yarmouth Geosol; includes highly weathered portions of the Banner Formation (pre-Illinois Episode); occurs below the Glasford or Pearl Formations
Silt loam to clay loam diamicton, with beds of loamy sandy, gravelly sand or silt; dark greenish gray to light olive brown to grayish brown to dark gray; few small pebbles of local (Pennsylvanian) micaceous fine-grained sandstone, bluish gray mudstone, or weathered shale fragments are typical in diamicton; may include beds of sand and gravel up to 20 ft thick; massive (in diamicton) to stratified; noncalcareous to calcareous; loose to very stiff; up to 60 ft thick	Banner Formation, undifferentiated (cross sections only) b	**Till, ice-marginal sediment**, lacustrine deposits, outwash, and colluvium; may contain Yarmouth Geosol weathering (oxidation, leaching, and pedogenic features) in upper portions; proglacial sand and gravel may occur above, below, or interspersed with diamicton; a few feet of colluvial deposits may occur above bedrock
PENNSYLVANIAN BEDROCK		
Shale, mudstone, siltstone, limestone, and sandstone; dark greenish gray to dark gray to olive to brown, micaceous; laminated (in shale and mudstone) to bedded; limestone units may contain marine fossils; sandstone is typically fine grained and micaceous; noncalcareous to weakly calcareous (in shale) to strongly calcareous (in limestone)	Pennsylvanian bedrock IP	**Bedrock or near-surface bedrock** (within 5 ft of land surface); shallow marine, deltaic, or terrestrial; one area of bedrock outcrop (<5 ft in thickness) was noted in the northeastern part of the quadrangle; includes Bond Formation or Shelburn-Patoka Formation at depths of up to 300 feet

[1]The time periods for the Wisconsin Episode and the Hudson Episode are reported as calibrated radiocarbon years and can be directly compared to calendar years before 1950 (Stuiver et al. 2015).

Base map compiled by Illinois State Geological Survey from digital data (2012 and 2015 US Topo) provided by the United States Geological Survey. Shaded relief and contours derived from Bond County 2015 and Fayette County 2011 LiDAR elevation data.

North American Datum of 1983 (NAD 83)
Projection: Transverse Mercator
10,000-foot ticks: Illinois Coordinate System of 1983, east and west zones
1,000-meter ticks: Universal Transverse Mercator grid system, zone 16

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SCALE 1:24,000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

BASE MAP CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1988

Geology based on field work by D. Grimley and P. Szocinski, 2017–2018.

Digital cartography by Deette M. Lund and Jennifer E. Carrell, Illinois State Geological Survey.

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This map has not undergone the formal Illinois Geologic Quadrangle map review process. Whether or when this map will be formally reviewed and published depends on the resources and priorities of the ISGS.

The Illinois State Geological Survey and the University of Illinois make no guarantee, expressed or implied, regarding the correctness of the interpretations presented in this document and accept no liability for the consequences of decisions made by others on the basis of the information presented here. The geologic interpretations are based on data that may vary with respect to the accuracy of geographic location, the type and quantity of data available at each location, and the scientific and technical qualifications of the data sources. Maps or cross sections in this document are not meant to be enlarged.

ROAD CLASSIFICATION
Interstate Route
U.S. Route
State Route
Local road

Data Type
- Outcrop
- Outcrop from field notes (ISGS Archives)
- Stratigraphic boring
- Water-well boring
- Engineering boring
- Oil and gas boring
- Abandoned sand and gravel pit
- Contact
- Inferred contact
- Buried contact
- Z—Z′ Electrical resistivity profile line (profiles shown in Fig. 1 of report)
- A—A′ Line of cross section
- S 26211 Labels indicate samples (s). Boring and outcrop labels indicate the county number. A dot indicates the boring or outcrop extends to bedrock.
- drumlin/megaflute (subglacial lineation); arrow indicates glacial flow direction

Note: The county number is a portion of the 12-digit API number on file at the ISGS Geological Records Unit. Most well and boring records are available online from the ISGS website.

ADJOINING QUADRANGLES
1 Greenville
2 Mulberry Grove
3 Hagarstown
4 Beaver Creek
5 Wildcat Lake
6 Stolletown
7 Keyesport
8 Boulder

APPROXIMATE MEAN DECLINATION, 2018
2° EAST
TRUE NORTH
MAGNETIC NORTH

ILLINOIS
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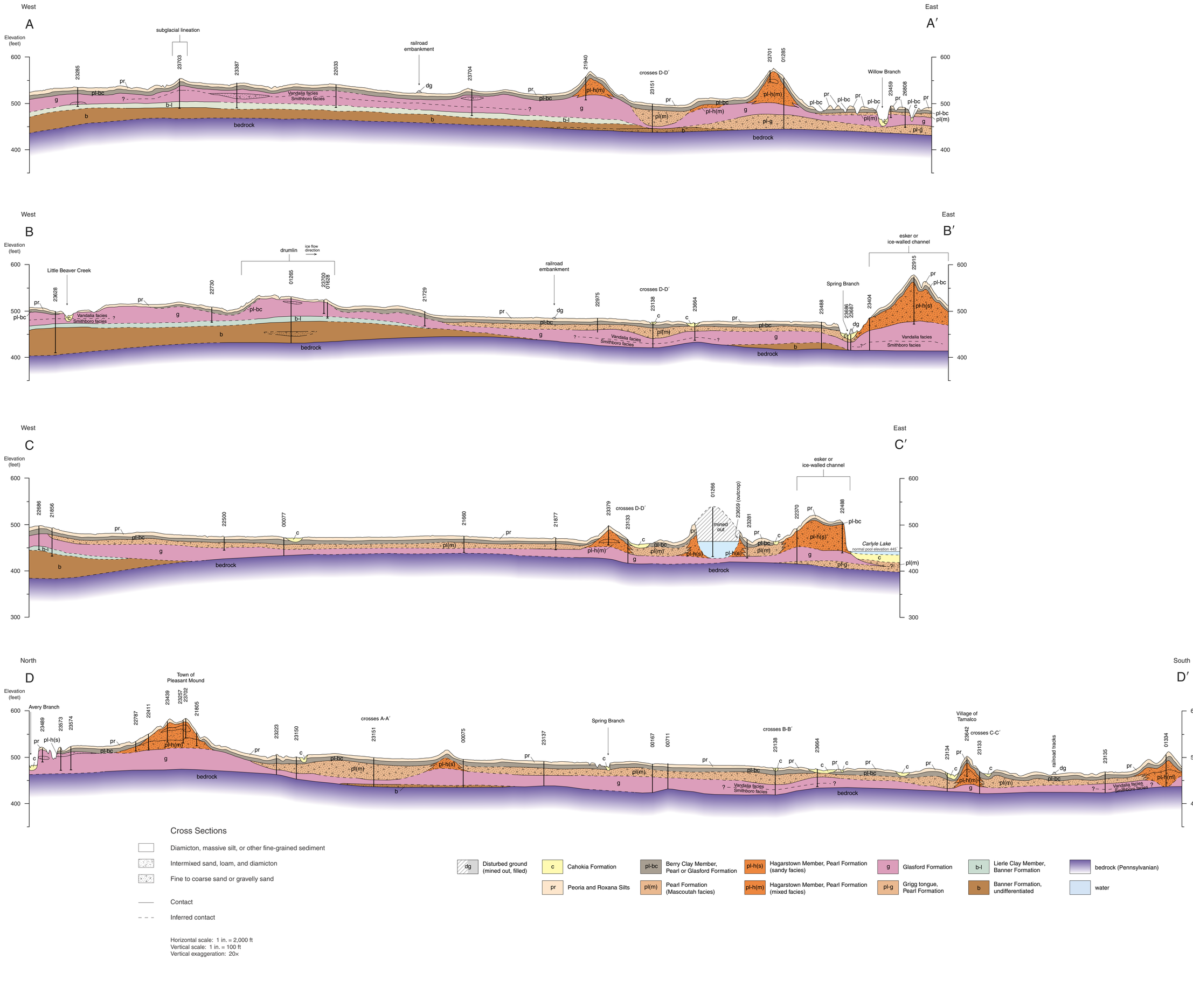

Cross Sections

- Diamicton, massive silt, or other fine-grained sediment
- Intermixed sand, loam, and diamicton
- Fine to coarse sand or gravelly sand
- Contact
- Inferred contact

Horizontal scale: 1 in. = 2,000 ft
Vertical scale: 1 in. = 100 ft
Vertical exaggeration: 20×

- dg — Disturbed ground (mined out, filled)
- c — Cahokia Formation
- pr — Peoria and Roxana Silts
- pl-bc — Berry Clay Member, Pearl or Glasford Formation
- pl(m) — Pearl Formation (Mascoutah facies)
- pl-h(s) — Hagarstown Member, Pearl Formation (sandy facies)
- pl-h(m) — Hagarstown Member, Pearl Formation (mixed facies)
- g — Glasford Formation
- pl-g — Grigg tongue, Pearl Formation
- b-l — Lierle Clay Member, Banner Formation
- b — Banner Formation, undifferentiated
- bedrock (Pennsylvanian)
- water

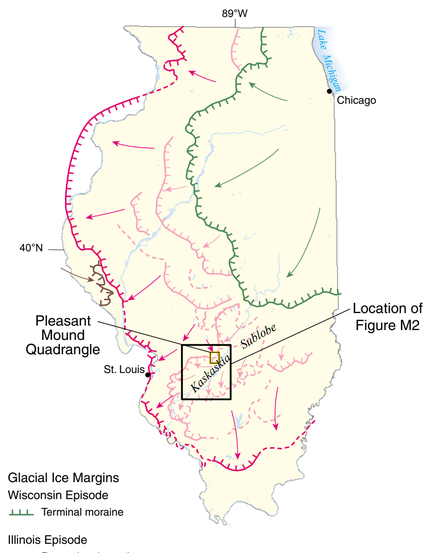

Figure M1 Glacial ice margins in Illinois during the middle to late Pleistocene. The location of Figure M2 is outlined in black. Arrows indicate approximate glacial ice flow directions.

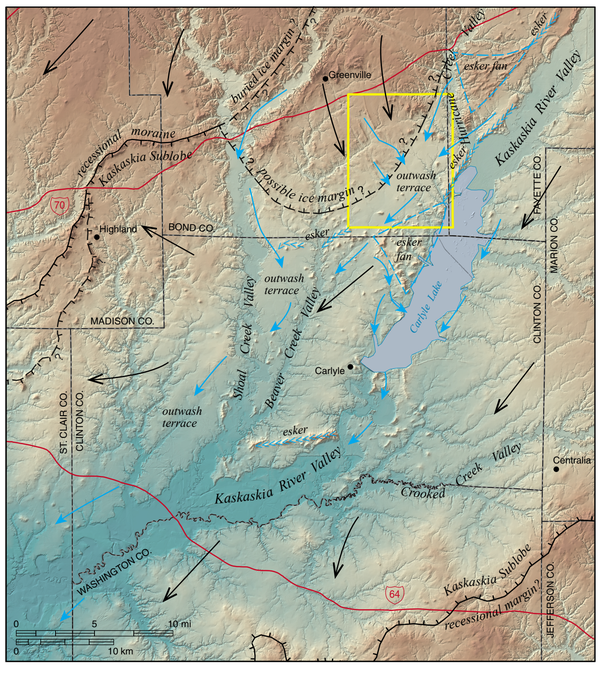

Figure M2 Location of the Pleasant Mound Quadrangle, outlined in yellow, within the Kaskaskia Basin showing interpreted recessional moraines and deglacial features of the Kaskaskia Sublobe. Blue arrows indicate the path of meltwater flow during deglaciation and ablation of the Kaskaskia Sublobe in the study area. Black arrows show interpreted glacial flow directions.

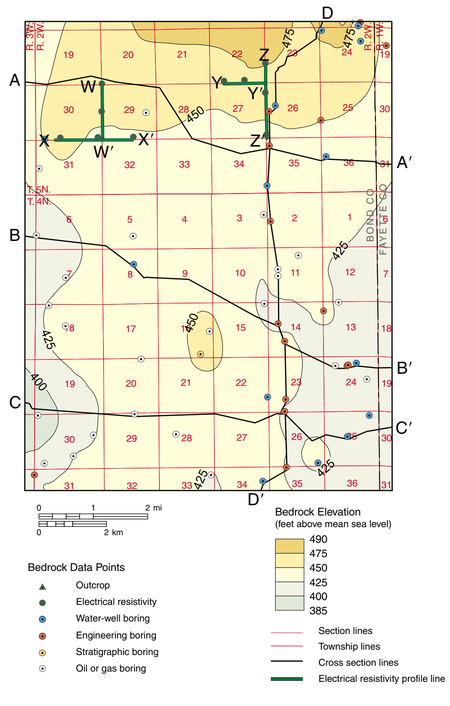

Figure M3 Bedrock topography of the Pleasant Mound Quadrangle. Localities of all data that reliably indicate the bedrock surface are shown (many of these data are not shown on the surficial map). Map scale is 1:100,000.

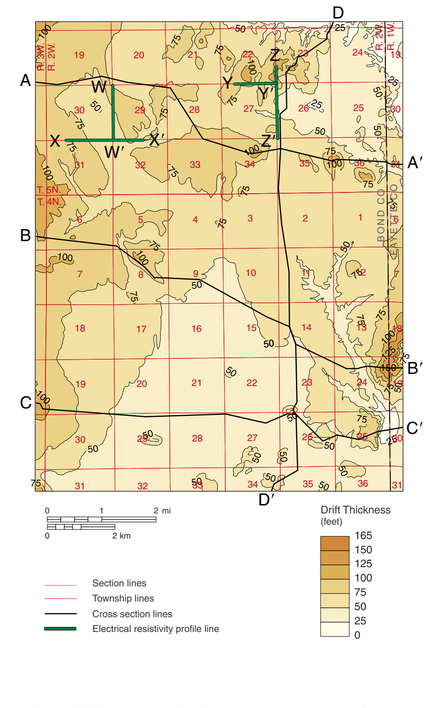

Figure M4 Drift thickness of the Pleasant Mound Quadrangle. Drift includes all the unconsolidated sediments above bedrock (e.g., alluvium, loess, till, outwash). Data point locations are the same as in Figure M3. Map scale is 1:100,000.