SURFICIAL GEOLOGY OF ROMEOVILLE QUADRANGLE
COOK, DUPAGE, AND WILL COUNTIES, ILLINOIS

Prairie Research Institute
ILLINOIS STATE GEOLOGICAL SURVEY

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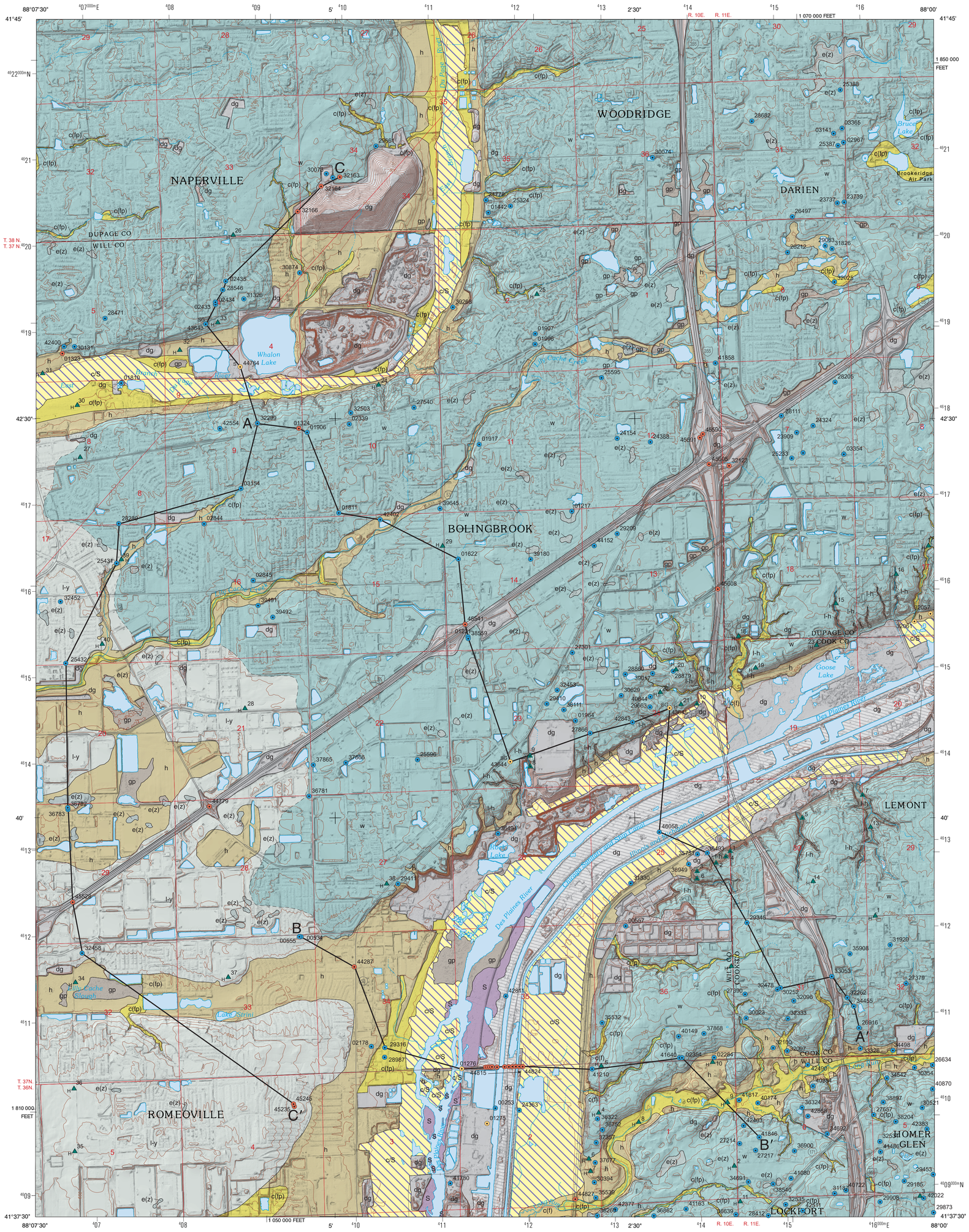
2017

STATEMAP Romeoville-SG



QUATERNARY DEPOSITS

Description	Unit	Interpretation
HUDSON EPISODE (~14,700 years before present (B.P.) to today)[1]		
Diamicton, sand, gravel, silt, and peat; as much as 40 feet thick	Disturbed ground (dg)	**Disturbed land;** includes former gravel pits and major areas of construction
Mucky sand, silt and clay ('natural materials') mixed with post settlement refuse, including industrial and sanitary sewage; about 20 feet thick	Disturbed ground, dredge spoils (dg)	**Disturbed land;** dredge spoils from creation of canals
Peat, muck, organic silt and clay; interbedded with sand, silt, and clay in some places; up to about 10 feet thick typically	Grayslake Peat (gp)	**Organic debris accumulated in depressions;** intertongues with the Equality and Cahokia Formations
Sand, silt, and clay; massive; locally containing beds of sand; as much as 30 feet thick; but generally less than 15 feet thick in smaller upland valleys	Cahokia Formation (c)	**Alluvium in floodplains and channels of modern rivers and streams;** alluvial fan deposits in some places
Sand, silt, and clay; stratified; locally containing beds of sand; from 5 to 15 feet thick	Cahokia Formation, fan (c(f))	**Alluvium in floodplains and channels of modern rivers and streams;** alluvial fan deposits in some places
Sand, silt, and clay; stratified; locally containing beds of sand; from 5 to 25 feet thick	Cahokia Formation, floodplain (c(fp))	**Alluvium in floodplains and channels of modern rivers and streams;** includes alluvial fan deposits locally
Silt, silty sand and sand; mostly uniform; from 5 to 15 feet thick	Equality Formation (silty facies) (e(z))	**Glaciolacustrine nearshore sediments;** few deposits are slackwater; intertongues with alluvium of Cahokia Formation or Henry Formation
WISCONSIN EPISODE: Michigan Subepisode (~29,000–14,700 years B.P.)[1]		
Sand, typically with little gravel, interbedded with uncommon beds of silt or diamicton; typically less than 50 feet thick	Henry Formation (h)	**Proglacial Outwash** along East Branch DuPage River, Lily Cache, and Long Run Creeks; deposited in glacial meltwater channels and in alluvial fans
Sand and gravel with interbeds of silt and clay; gray; bedded to laminated; as much as 20 feet thick	Henry Formation, unnamed tongue (cross sections only) (h(l-y))	**Proglacial outwash** and deltaic (?) deposits; underlies deposits of the Yorkville Member; ditribution not well-known
Diamicton; silty clay, silty clay loam, and clay; gray, oxidizes to yellowish brown; includes layers of sand and gravel, silt, and silty clay; as much as 70 feet thick	Lemont Formation, Yorkville Member (l-y)	**Till, debris flow deposits, and lake sediment** associated with the Rockdale Moraine
Diamicton, loam and silt loam as much as 25 feet thick; sandy loam; yellowish brown; attaining about 60 feet maximum thickness	Lemont Formation, Haeger Member (l-h)	**Till and debris flow deposits**
Sand and gravel; yellowish brown; stratified in places; otherwise massive; includes large boulders; as much as 55 feet thick	Henry Formation, Beverly Tongue (cross sections only) (h-b)	**Proglacial outwash** deposited in broad plains; underlies deposits of the Haeger Member, deposited during ice advance
Diamicton, loam to silty clay loam; uniform; stratified in places, gray (fresh) to brown, yellowish brown, and light gray (weathered); may include patches of surficial silt, clay and sand (Equality Formation) with lenses of sand and gravel and laminations; as much as 70 feet thick	Wadsworth Formation (w)	**Till and debris flow deposits** associated with the West Chicago Moraine and the Valparaiso Morainic System
PRE-QUATERNARY DEPOSITS		
SILURIAN SYSTEM (440-410 million years B.P.)		
Dolomite; upper 30 feet may include layers of diamicton about 1 to 3 inches thick along bedding planes	Silurian Bedrock (S)	**Dolomitized carbonate bank deposits;** diamicton was likely injected by glacier
	(beneath 5 feet or less of Cahokia Formation) (c/S)	

[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.

Data Type

- Hand auger station
- Stratigraphic boring
- Water-well boring
- Engineering boring
- Outcrop

SG 26211 — Labels indicate samples (s) or geophysical log (g). Boring labels indicate the county number. Outcrop labels indicate geologist's field number. Dot indicates boring or outcrop is to bedrock.

- Contact
- Inferred contact
- A — A′ Line of cross section

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 Web site.

Base map compiled by Illinois State Geological Survey from digital data (2015 US Topo) provided by the United States Geological Survey. Shaded relief and contours derived from LiDAR data provided by Will County (2004), Dupage County (2006), and Cook County (2008).

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

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SCALE 1:24,000
1 MILE
1 KILOMETER

BASE MAP CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1988

Geology based on field work by O. Caron, 2016–2017.

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.

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1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 Naperville
2 Wheaton
3 Hinsdale
4 Normantown
5 Sag Bridge
6 Plainfield
7 Joliet
8 Mokena

APPROXIMATE MEAN DECLINATION, 2017
3½° EAST
TRUE NORTH
MAGNETIC NORTH

ROAD CLASSIFICATION
- Interstate Route
- State Route
- Local road

Introduction

This surficial geologic map of the Romeoville 7.5' Quadrangle is part of a long-term geological mapping project (Caron, 2016; Caron and Phillips, 2015; Curry and Grimley, 2001; Curry and Bruegger, 2014) in Will, DuPage, and Cook Counties. This map continues Illinois State Geological Survey (ISGS) efforts in northeastern Illinois to map deposits at the land surface and in the subsurface down to bedrock to gain a better understanding of the complex geology left behind by repeated glaciations and associated flooding events. The Romeoville Quadrangle is located on the edge of the Rockdale Moraine and the Valparaiso Morainic System, about 35 miles from the southern shore of Lake Michigan and the southern part of the City of Chicago (Fig. 1 [map sheet 2]). The largest communities in the area include the cities of Romeoville (39,680, United States Census Bureau 2016), Naperville (141,853), Woodridge (32,971), Bolingbrook (73,366), Lockport (24,839), and the village of Homer Glen (24,220). Interstate highways I-55 and I-355 travers teh map.

Setting

The landscape was constructed during the last glaciation (Wisconsin Episode) between about 29,000 and 14,700 cal yr BP (Curry et al., 2014). Four moraines constitute the Valparaiso Morainic System: the Westmont, Wheaton, West Chicago, and Manhattan moraines (Fig. 1; Willman and Frye 1970). Shallow valleys trending northeast-southwest crosscut the moraines and were likely formed by subglacial meltwater channels that evolved near the ice margin during downwasting of the ice (Menzies 1995). The discontinuous Rockdale Moraine is the western most and oldest upland feature. Formed of diamicton of the Yorkville Member, the Rockdale Moraine has been dissected by the Des Plaines and DuPage Rivers and by perched channels (Lilly Cache Creeks) that formed and were abandoned during the last deglaciation. Bedrock comprises resistant Silurian sedimentary rocks in largely low relief and gently dipping settings.

Mapping Methods

The surficial geology map is based primarily on interpretation of aerial imagery, LiDAR elevation data, boring records archived at the ISGS, new outcrop and hand auger descriptions, and the Will County soils map (Hanson, 2004). The soil survey map details soil parent materials in the upper five feet, which in Will County are glacial and post-glacial deposits. Geologic contacts were verified at 10 outcrops and 40 sites by examining exposures along roads, creeks and ditches, and by sampling with a hand auger. The subsurface data include detailed studies of 8 stratigraphic test holes including 5 stratigraphic test holes drilled by the ISGS, 175 water well logs, and 20 bridge and foundation ("engineering") borings from the Will County Highway Department. Positions of some map boundaries and descriptions of some units were modified based on geotechnical log and test hole descriptions, from the field sites, and from other archival data. Locations of the water-well logs and geotechnical borings were confirmed by plat books of land ownership, aerial photography, tax records, and site visits. The records for all data sources are on file at the ISGS Geological Records Unit. We acquired a total of 65 feet of core at 2 locations using hydraulic push methods, and a total of 280 feet of core at three locations using continuous wireline coring. The three wireline cores reached bedrock and were logged with natural gamma-ray. Particle-size distributions (Table 1) were determined by laser diffraction on 50 samples from test holes and 10 samples from outcrop and hand auger holes. Finally, clay mineralogy was determined by XRD on 25 samples and elemental determinings by Energy Dispersive XRF was performed on 35 samples from test holes. Ages of two samples were obtained by optically stimulated luminescence (OSL) methods. Sample testing was completed in Prairie Research Institute laboratories.

Table 1 Summary of particle size of selected map units

Units	Sand (%)	Silt (%)	Clay (%)
Grayslake Peat, gp	10-15	45-55	33-45
Cahokia Formation, c	25-40	35-45	20-27
Equality Formation, (z)	9-12	60-66	30-35
Henry Formation, h	60-70	32-34	8-15
Henry Formation, Beverly Tongue, h-b	60-70	25-35	5-13
Wadsworth Formation, w	15-20	45-51	26-30
Lemont Formation, Haeger Member, l-h	29-40	40-55	12-18
Lemont Formation, Yorkville Member, l-y	5-13	42-49	44-51
Henry underlying Yorkville Member, h(l-y)	60-62	20-25	10-15
Silurian bedrock	ND	ND	ND

Geology and Surficial Deposits

The glacial stratigraphy of the Romeoville 7.5' Quadrangle is dominated by sorted deposits of the Mason Group and glacigenic diamicton of the Wedron Formation (Hansel and Johnson 1996; Fig. 2). These units attain thicknesses of more than 150 feet (45.7 m) on the Valparaiso Morainic System (Fig. 4). Older units of the Wedron Group (Tiskilwa Formation and Batestown Member, Lemont Formation) are absent.

Bedrock Surface

Silurian-age rocks at the bedrock surface are composed of light gray, fine-grained dolomite and limestone. Relief is gentle bedrock highlands mainly in the southern portion of the quadrangle ascend gently from about 600–625 feet mean sea level (MSL) to 650 MSL feet in the northwestern edge of the study area (Fig. 3). The most significant features of the bedrock topography of the Romeoville Quadrangle are the Des Plaines (575-600 feet MSL) and the DuPage River (600- 625 feet MSL) Valleys (Fig. 4).

Glacial Sediments

The lowermost unit is an unnamed tongue of sand and gravel below the Yorkville Member, h(l-y). This outwash consists of interbedded brown to gray fine gravel to sandy gravel, and it is typically less than 20 feet thick. The Yorkville Member (Lemont Formation; l-y) is a gray, fine textured diamicton that contains lenses of gravel, sand, silt, and clay. It is typically 40 feet but up to 70 feet thick. The Yorkville Member is identified at the surface in the southwestern part of the quadrangle (west of the Des Plaines River). The Haeger Member (Lemont Formation) diamicton is yellowish brown, coarse-grained, and friable, and with a high dolomite content. This unit is greater than 60 feet thick in some places. The extent and the thickness of this diamicton is often difficult to identify in the region because of limited exposure, but the Haeger Member was clearly identified in the Romeoville, Joliet, and Mokena Quadrangles. This diamicton was clearly differentiable north of the Hickory Creek valley, but has a patchier distribution south of the valley. It is also associated with the underlying Beverly Tongue of the Henry Formation. The Beverly Tongue (h-b) is regionally the thickest and most continuous subunit of the Henry Formation (50 feet thick). The fill along Spring Creek contains a large proportion of sand and gravel of the Beverly Tongue. At places, the lower part of the fill contains finer-grained material than the upper part. The sand and gravel is overlain at some locations by the diamictons of the Haeger Member of the Lemont Formation and by the Wadsworth Formation, the latter of which contains a high percentage of silt and clay. On the quadrangle, the uppermost diamicton unit has a heterogeneous lithology that is locally consistent with the Wadsworth Formation (w). The Wadsworth Formation is an extensive surficial clay-rich stratigraphic unit in northeastern Illinois and certainly comprises the surficial unit. It is interpreted commonly as interstratified clayey till and lacustrine sediment (Hansel and Johnson, 1996). In the Romeoville Quadrangle, this unit is greater than 70 feet thick.

Postglacial Sediment

Deposits of silt and clay, peat, sandy gravel, and sand overlie the glacial units, filling the valleys throughout the mapped area as well as many low spots scattered across the uplands. Alluvium comprised of fine-grained floodplain and coarser-grained active channel deposits is undifferentiated within the Cahokia Formation (c). Bridge boring data indicate that the floodplain unit ranges from 15 to 30 feet thick. The Grayslake Peat (gp) consists of peat, muck, organic silt and clay, and interbedded sand, and is less than 10 feet thick. The Grayslake Peat was deposited in depressions and at the toes of slopes. The glacial and post-glacial silt and clay lacustrine sediments are assigned to the Equality Formation. The glaciolacustrine nearshore sediments e(z) are composed primarily of silt, silty sand, and sand. The deposits are relatively thin (less than 15 feet thick) and are typically discontinuous in Will County. This unit was deposited in ice-dammed lakes during late-glacial ice stagnation and retreat.

Important Findings

- Three glacial diamicton units were identified: The Yorkville and Haeger Members of the Lemont Formation, and the Wadsworth Formation. The uppermost diamicton unit is the Wadsworth Formation which forms the West Chicago Moraine and the Valparaiso Morainic System.
- Two significant sections were discovered. Both sections are located near the mouth of a short, unnamed tributary to the Des Plaines River 1.5 mi (2.4 km) northwest of the type section of the Lemont Formation (Hansel and Johnson 1996a). The stream had eroded the east side of the front of the West Chicago Moraine. This segment of the Des Plaines River valley is the downstream end of the Chicago Outlet, which served as an overflow channel or spillway for high-level lakes in the Lake Michigan basin. The sediment sequence here is similar to that of the Lemont section. The Lemont drift was originally named by Bretz (1939) and subsequently described in considerable detail by Bretz (1955), Horberg and Potter (1955), and Bogner (1973).
- The sequence includes 10 ft (3.1 m) of proglacial sand and gravel (the Beverly Tongue) overlain by 12 ft (3.7 m) of sandy diamicton (Haeger Member, Lemont Formation) and capped by 8 ft (2.4 m) of silty diamicton (Wadsworth Formation). Of interest for geologic mapping in this region is the southernmost extent of the Beverly Tongue and the Haeger Member. Cores of the Beverly and Haeger units mantled by silty and clayey diamicton of the Wadsworth Formation support the conclusion by Johnson and Hansel (1989), that the West Chicago Moraine (south of Algonquin) was a palimpsest feature.
- Two ages obtained by optically stimulated luminescence indicate the age of the Beverly Tongue between about 18,500 ± 2,000 yr BP and 19,300 ± 2,500 yr BP. Both ages are consistent with the Woodstock Phase in a chronological framework based on radiocarbon ages from ice-walled lake plains.
- The Lily Cache channel and the DuPage River valley were formed when the glacier began to retreat from its maximum position at the Rockdale Moraine. Later, the Lily Cache abandoned in favor of the modern course of the Des Plaines River, with its valley bottom elevation of about 530 feet (161.5 m).

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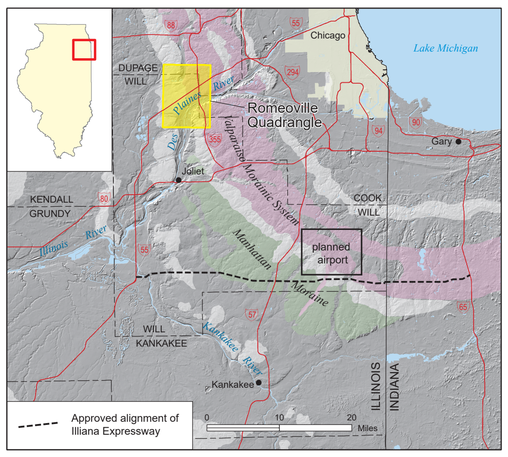

Figure 1 Location map for the Romeoville Quadrangle in northeastern Illinois. The area includes portions of the Valparaiso Morainic System and the Manhattan Moraine. Moraines modified from Willman and Frye (1970). Dashed lines show approved alignment of the Illiana Expressway corridor, and the black box shows the area of the proposed South Suburban Airport.

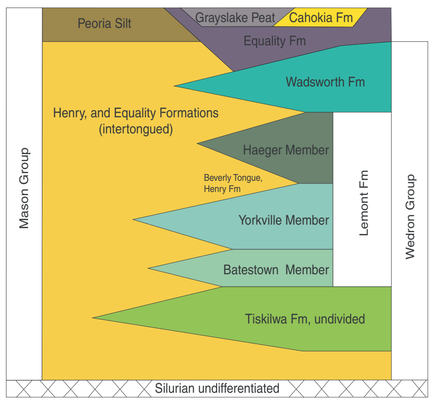

Figure 2 Schematic vertical and intertonguing relationships among the lithostratigraphic units of Will County and environs (Caron and Curry, 2016). The Batestown Member and the Tiskilwa Formation were not identified in the Romeoville 7.5' Quadrangle.

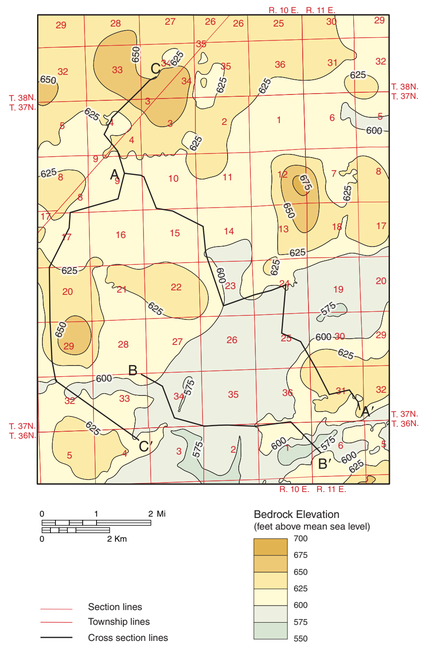

Figure 3 The generalized topography of the Bedrock surface of the Romeoville Quadrangle. Map scale is 1:100,000.

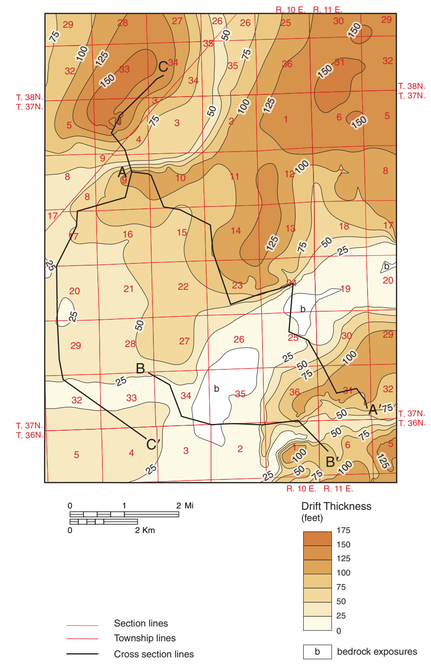

Figure 4 Drift thickness of the Romeoville Quadrangle. Drift includes all the unconsolidated sediments above bedrock (e.g., till, alluvium, outwash). Map is 1:100,000.