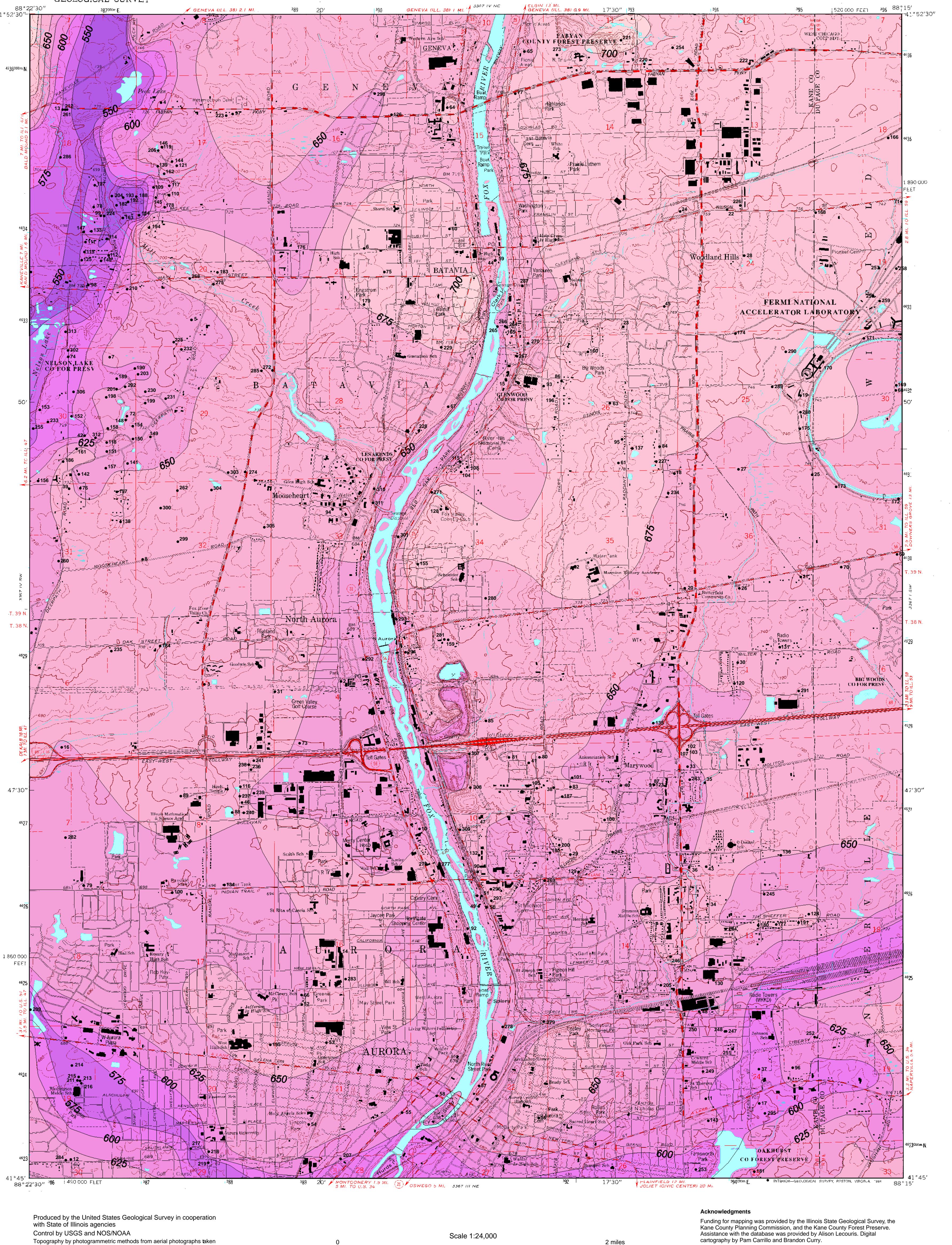


## TOPOGRAPHIC MAP OF THE BEDROCK SURFACE

Aurora North Quadrangle,  
 Kane and Du Page Counties, Illinois

B. Brandon Curry

UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 GEOLOGICAL SURVEY



Produced by the United States Geological Survey in cooperation with State of Illinois agencies  
 Contained by USGS and NOS/NOAA  
 Containing photogrammetric methods from aerial photographs taken 1963, field checked 1964. Revised from serial photographs taken 1968.  
 Field checked 1991. Map edited 1993.  
 1993. Transverse Mercator coordinate system.  
 1992. North American Datum of 1983 (NAD 83) is shown by dashed corner ticks.  
 The values of the shift between NAD 27 and NAD 83 for 7.5-minute intersections are given in USGS Bulletin 1975.

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For further information about this map contact:  
 ILLINOIS STATE GEOLOGICAL SURVEY  
 615 East Peabody Drive  
 Champaign IL 61820-6964  
 (217)333-4747  
<http://www.isgs.uiuc.edu>



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### Introduction

The bedrock surface in the Aurora North Quadrangle is the top of the lithified Silurian and Ordovician dolostone and shaly dolostone that underlies glacial drift or modern stream sediment. Along the Fox River and near the mouths of streams tributary to the Fox River, bedrock is covered by less than 10 feet of alluvium and colluvium. In some areas, the bedrock is naturally exposed (fig. 1). Several large quarries reveal as much as 30 feet of cherty and non-cherty Silurian dolostone along the Fox River (fig. 2).

The topography of the bedrock surface of Kane County has been mapped at a scale of 1:62,500 (Vaiden and Curry 1990). Regional maps of the same surface also have been published (fig. 3).

### Geologic History of the Bedrock Surface

The bedrock surface is a significant unconformity found throughout most of Illinois. Below this surface in northeastern Illinois are rocks that are more than 400,000,000 years old, and overlying the bedrock surface are rocks that are less than 10,000 years old (Curry and Seaber 1990). Most of the rock that occurs at just below the bedrock surface was deposited in warm, tropical oceans; most of the sediment deposited above the bedrock surface was deposited by continental glaciers.

The configuration of the bedrock surface probably has been most influenced by glacial erosion. In addition, there has been late glacial and postglacial erosion by the Fox River. Evidence for glacial erosion is most evident from the polished and striated bedrock surface observed in many quarries. Evidence also comes from the glacial diamicton (tilt) that contains clay to boulder-sized fragments of the underlying bedrock.

The rock just below the bedrock surface may be fresh or weathered. When the rock is fresh, it is commonly found to be polished and striated. In most places, the rock is fractured, weathered, and oxidized (manifested by orange to orange-brown stains and coatings in the upper 3 to 20 feet). Along the east side of the Fox River in south Batavia, a few bedrock cores indicated brecciated dolomite. In some areas, the bedrock surface is covered by thin soils derived from glacial till. Soil profiles from some sites in the Aurora North Quadrangle reveal organic-rich or reduced paleosols formed in silty and clayey slope deposits that were buried by glacial sediment. These weathered Quaternary sediments generally occur directly above bedrock.

### Map Use

This map of bedrock surface topography is useful for predicting the occurrence of sand and gravel aquifers that are generally found in the deeper parts of bedrock valleys (Curry and Seaber 1990). Not only do the bedrock valleys contain aquifers of various sizes, but they also are places where groundwater in the bedrock recharges groundwater in the drift. Two buried bedrock valleys are present on the Aurora North Quadrangle. A segment of the St. Charles Bedrock Valley crosses the northwestern corner of the map, and part of the Aurora Bedrock Valley crosses the southern part of the map. As shown on the regional bedrock topography map (fig. 3), both bedrock valleys are important features in Kane County. The City of Aurora has developed several municipal water wells in the Aurora Bedrock Valley, the northern portion of which is located in the Aurora North Quadrangle. The bedrock surface elevation and API number associated with the numbered data points on the map are given in Table 1. A unique API number is assigned to every water well and structural boring log on file at the Geological Records Unit at the Illinois State Geological Survey. API is an acronym for the American Petroleum Institute.

### Mapping Methods

This map was compiled from field observations, logs of water wells, structural test borings, and stratigraphic test borings in the Geological Records Unit of the Illinois State Geological Survey (ISGS). The bedrock surface elevation was estimated by subtracting the thickness of the glacial drift and unconsolidated material from the surface elevation. Usually, the surface elevation was estimated from the 7.5-minute USGS topographic map that has a contour interval of 10 feet. Notable records include the numerous structural borings for the Fermi National Accelerator Laboratory site in Aurora (McFadden et al. 1978; P. Keeler, personal communication 2000), bedrock cores from south-central Batavia sampled by the Illinois Environmental Protection Agency, water-well tests drilled by Layne-Western, Inc. (Gilkerson et

al. 1987, Curry and Seaber 1990), bedrock borings by the Western Sand & Gravel Company (B. Pierce, personal communication 2000), and various stratigraphic tests done by the ISGS, including a recent study of Nelson Lake, partially located in the northwestern part of the Aurora North Quadrangle (Sections 19 and 20, T. 39 N., R. 8 E.). Trends in the elevation of the bedrock surface were also estimated by seismic refraction methods. The location of the seismic lines are scattered throughout the study area (McFadden et al. 1989; Curry and Seaber 1990; Heigold 1990; Larson et al. 1991, 1992; Fitzpatrick et al. 1992). The bedrock surface elevation was estimated to be 10 to 15 feet thick, the presence of near-surface bedrock in some places was based on the soil survey maps of Goddard (1979). The edge of the map was matched with data from a map of the bedrock surface topography of Kane County and western Du Page County (Vaiden and Curry 1990) and other data on file at the ISGS. The three-dimensional model of the bedrock surface was created using the Vertical Mapper Version 2.0 (1998) computer program (fig. 4).

### Data Quality and Distribution

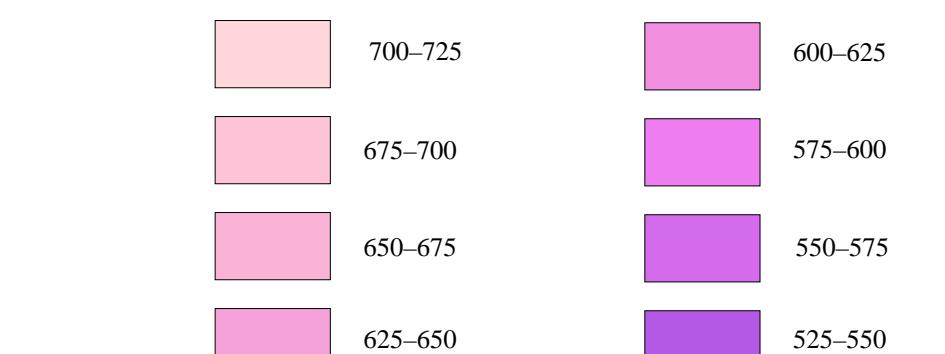
Locations of the wells and test holes used on the map were verified in the field by ISGS geologists. The quality of much of the data is excellent. Of the 400 data points used to make this map, 65 are high-quality data described by engineers and geologists (including 43 logs from Fermatil, 8 are outcrops (located by ISGS geologists), 25 are logs from Layne-Western, Inc. (for the purpose of siting municipal water wells), and 301 are logs from private water wells. The reliability of data derived from water-well logs is verified, in part, by similar bedrock surface elevations in subdivisions where often data density is high.

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### Contour Interval 25 Feet

### Elevation Datum Mean Sea Level Datum



Well Location with Bedrock Surface Elevation

Table 1 List of numbered wells on Aurora North bedrock topography map, bedrock surface elevation, and API numbers on file at the Geological Records Unit at the Illinois State Geological Survey. The user may contact the ISGS to obtain records for these wells; the user will be charged for mailing and xeroxing.

Map	API Number	Bedrock Surface Elevation	Map	API Number	Bedrock Surface Elevation	Map	API Number	Bedrock Surface Elevation
211	120892320000	555	281	120892320000	661	291	120892320000	559
212	120892320000	555	282	120892320000	643	292	120892320000	559
213	120892320000	664	283	120892320000	664	293	120892320000	664
214	120892320000	664	284	120892320000	664	294	120892320000	664
215	120892320000	664	285	120892320000	662	295	120892320000	662
216	120892320000	664	286	120892320000	662	296	120892320000	662
217	120892320000	664	287	120892320000	664	297	120892320000	664
218	120892320000	664	288	120892320000	660	298	120892320000	660
219	120892320000	664	289	120892320000	660	299	120892320000	660
220	120892320000	664	300	120892320000	660	300	120892320000	660
221	120892320000	664	301	120892320000	660	301	120892320000	660
222	120892320000	664	302	120892320000	660	302	120892320000	660
223	120892320000	664	303	120892320000	660	303	120892320000	660
224	120892320000	664	304	120892320000	660	304	120892320000	660
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226	120892320000	664	306	120892320000	660	306	120892320000	660
227	120892320000	664	307	120892320000	660	307	120892320000	660
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327	120892320000	660	328	120892320000	660	328	120892320000	660
329	120892320000	660	330	120892320000	660	330	120892320000	660
331	120892320000	660						