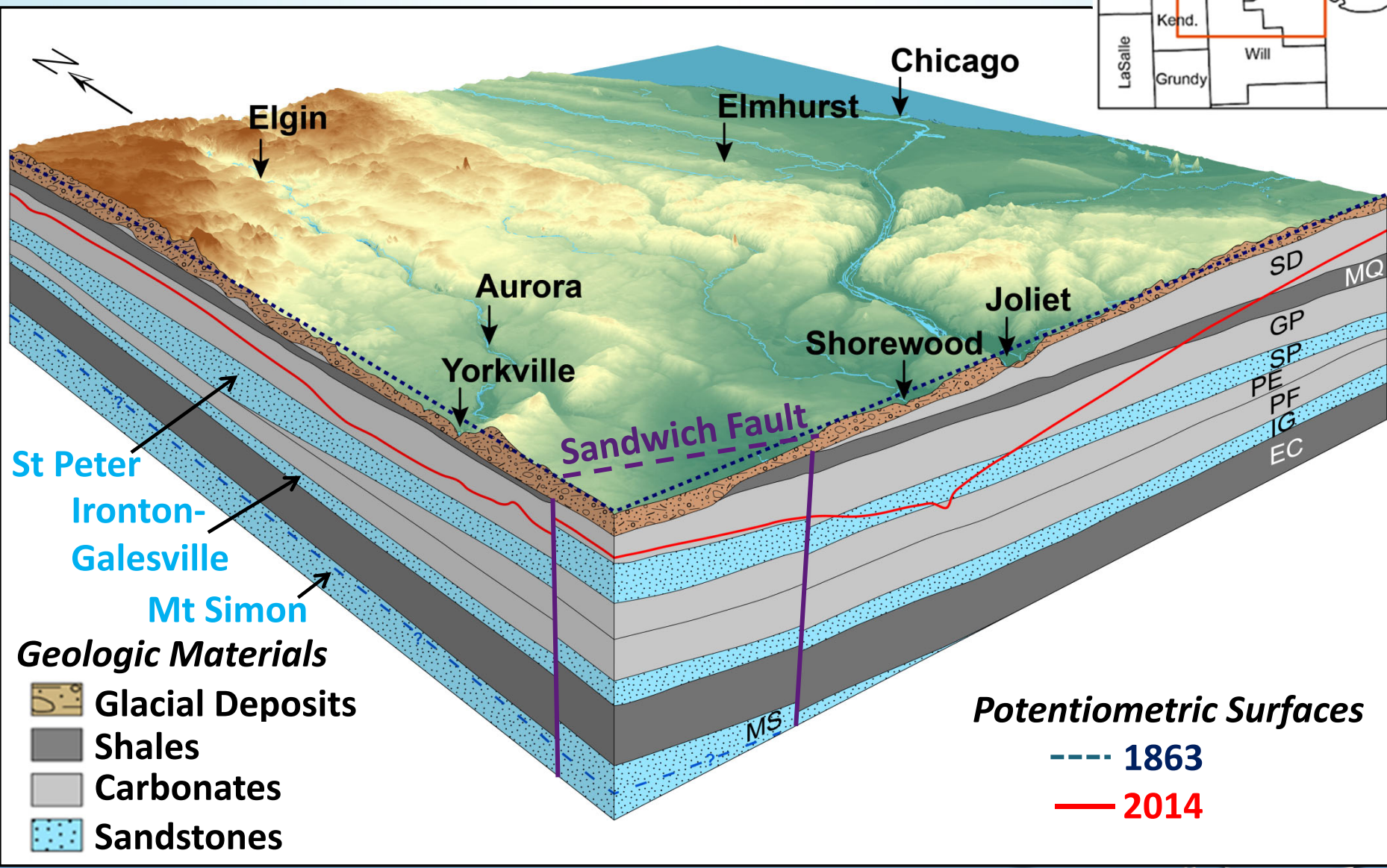
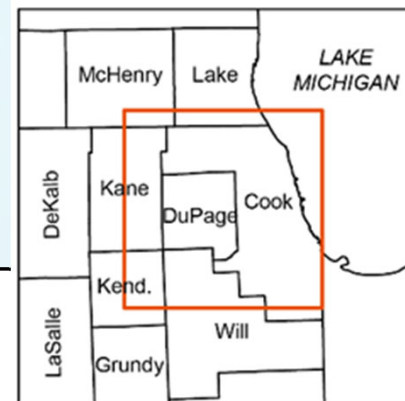


The Silurian Dolomite Aquifer in Northeastern Illinois

George Roadcap - Illinois State Water Survey



Regional Bedrock Geology



Regional Extent of the Silurian Dolomite

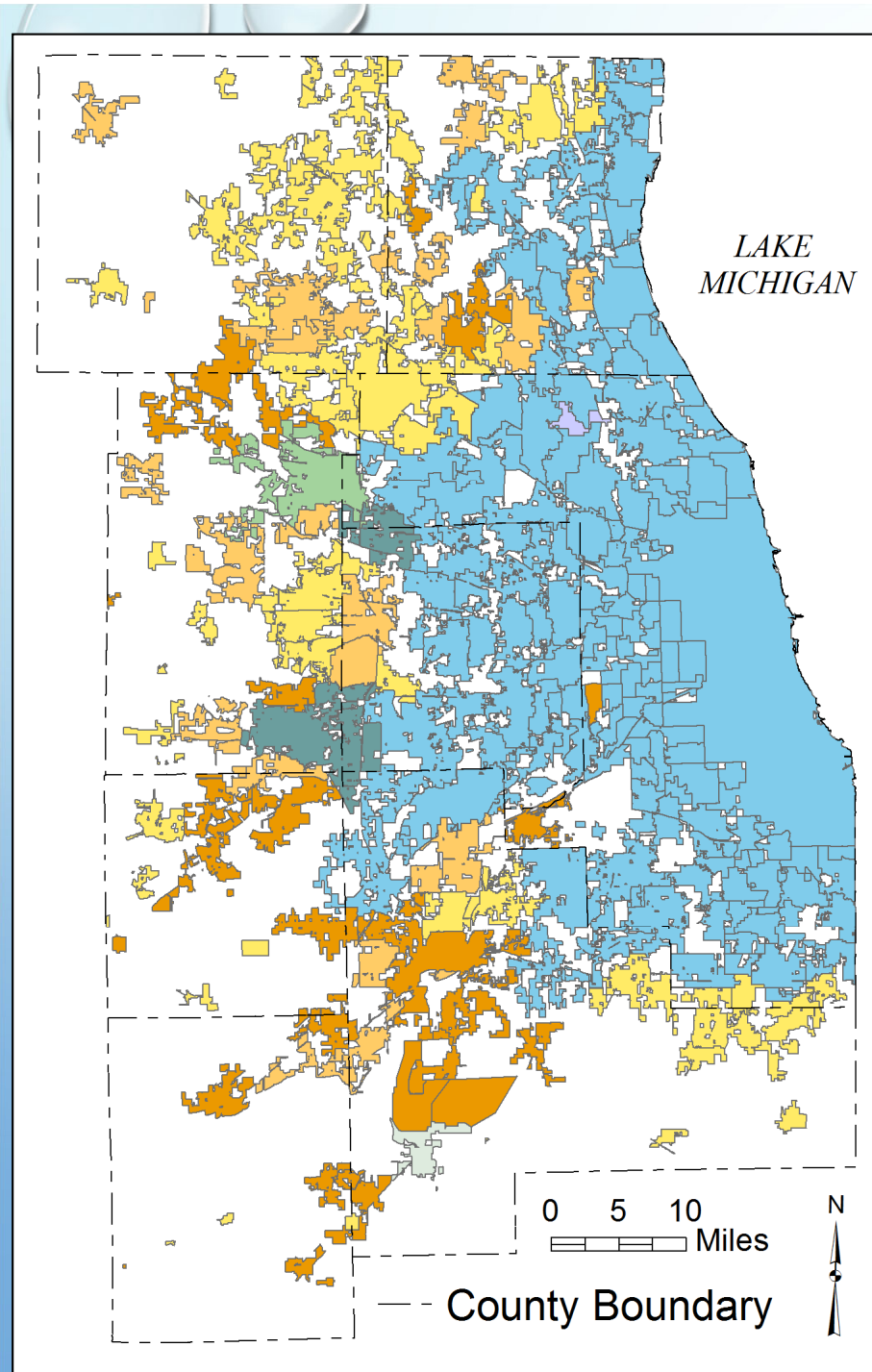


The Silurian Dolomite System

SERIES	FORMATION	MEMBER	COLUMN	THICK.* (ft)	GENERAL CHARACTER
NIAGARAN	Racine			300	Dolomite, pure, gray, vuggy, in reefs; and argillaceous, silty, brownish gray and greenish gray, cherty dolomite with beds of relatively pure dolomite, between the reefs
		Sugar Run			
	Joliet 40'-80'	Romeo		18-34	Dolomite, pure, light gray to white, mottled gray and pink; in faint thin stylonitic beds
		Markgraf		12-28	Dolomite, silty at base to slightly argillaceous at top, very light gray, cherty, medium-bedded
		Brandon Bridge		11-25	Dolomite, argillaceous to shaly, gray, red, green; contains a few pure beds; siliceous foraminifera abundant
ALEXANDRIAN	Kankakee 20'-50'	Plaines		1.5-3	Dolomite, pure, white, massive; contains Microcardinalia and Pentamerus; pitted smooth surface on top
		Troutman		11-29	Dolomite, pure, pinkish gray to greenish gray; in thin wavy beds with green clay partings; corals common
		Offerman		2.5-11	Dolomite, as above, but slightly argillaceous
		Drummond		1-11	Dolomite, as above, but massive, vuggy, glauconitic, locally sandy; contains Platymerella at base
	Elwood			0-30	Dolomite, slightly argillaceous, brownish gray; contains many layers of white chert
	Wilhelmi 0-100'	Birds		0-20	Dolomite, argillaceous, gray, slightly cherty
		Schweizer		0-80	Dolomite, very argillaceous, gray, and dolomitic shale

*Where overlain by next younger unit.

Source of Community Water Supplies



Groundwater (GW)

- Sandstone
- Sandstone (Partial)
- Shallow Bedrock/Glacial

Surface Water

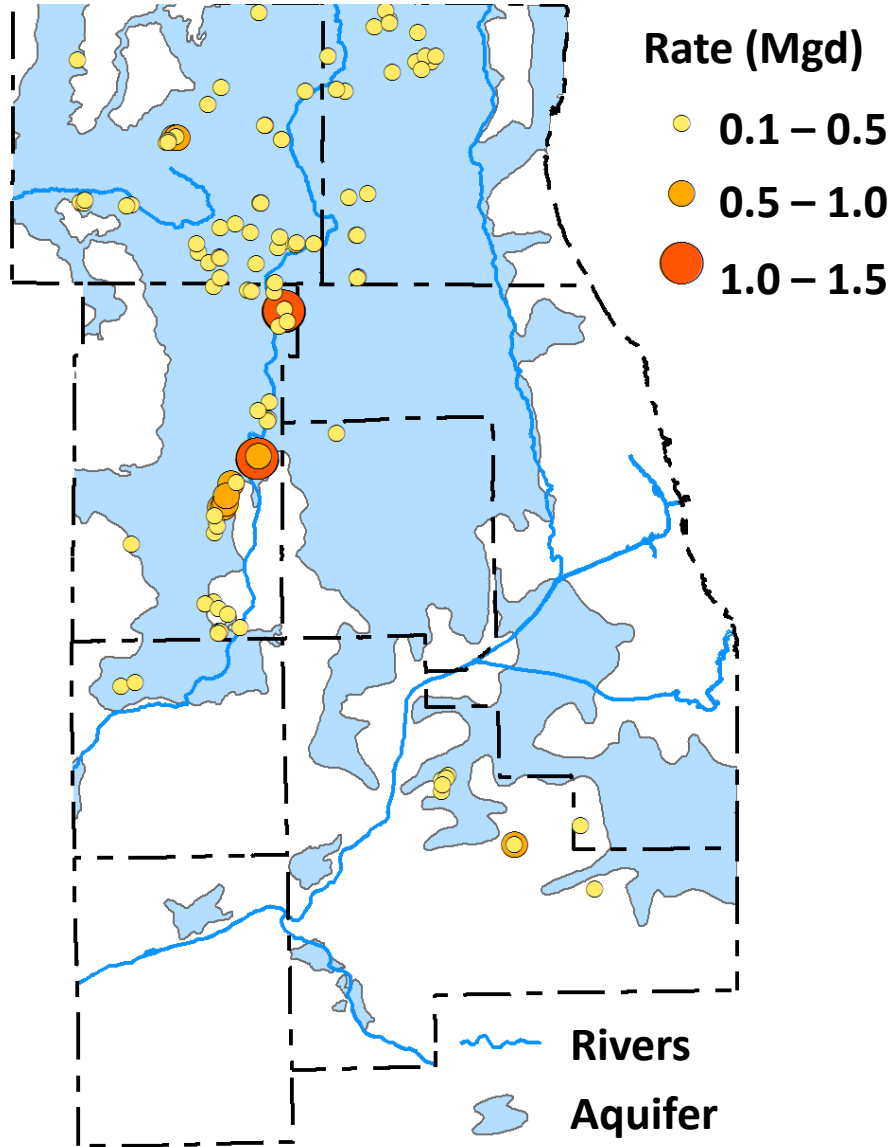
- Lake Michigan
- Fox River
- Kankakee River

Mixed Sources

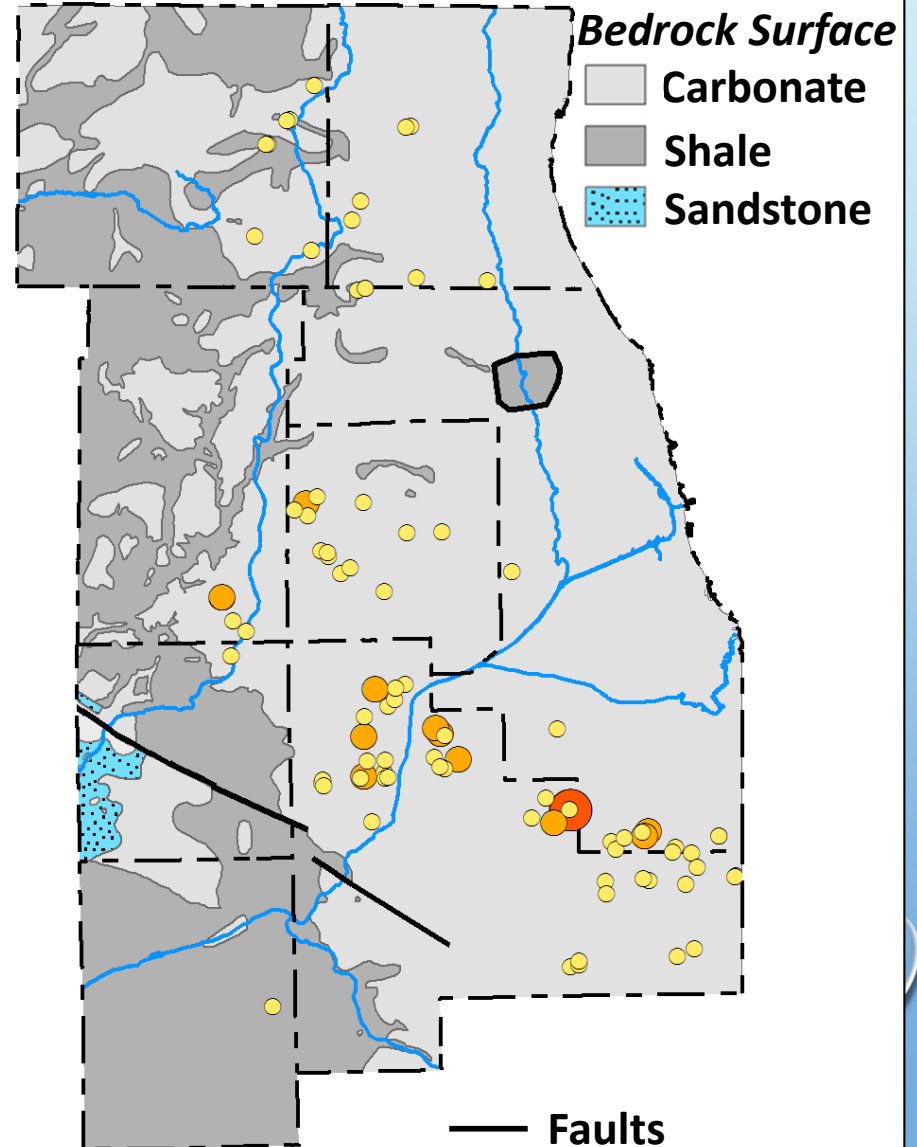
- Fox River/GW
- Lake Michigan/GW

Shallow Groundwater Withdrawals - 2012

Sand and Gravel Aquifer

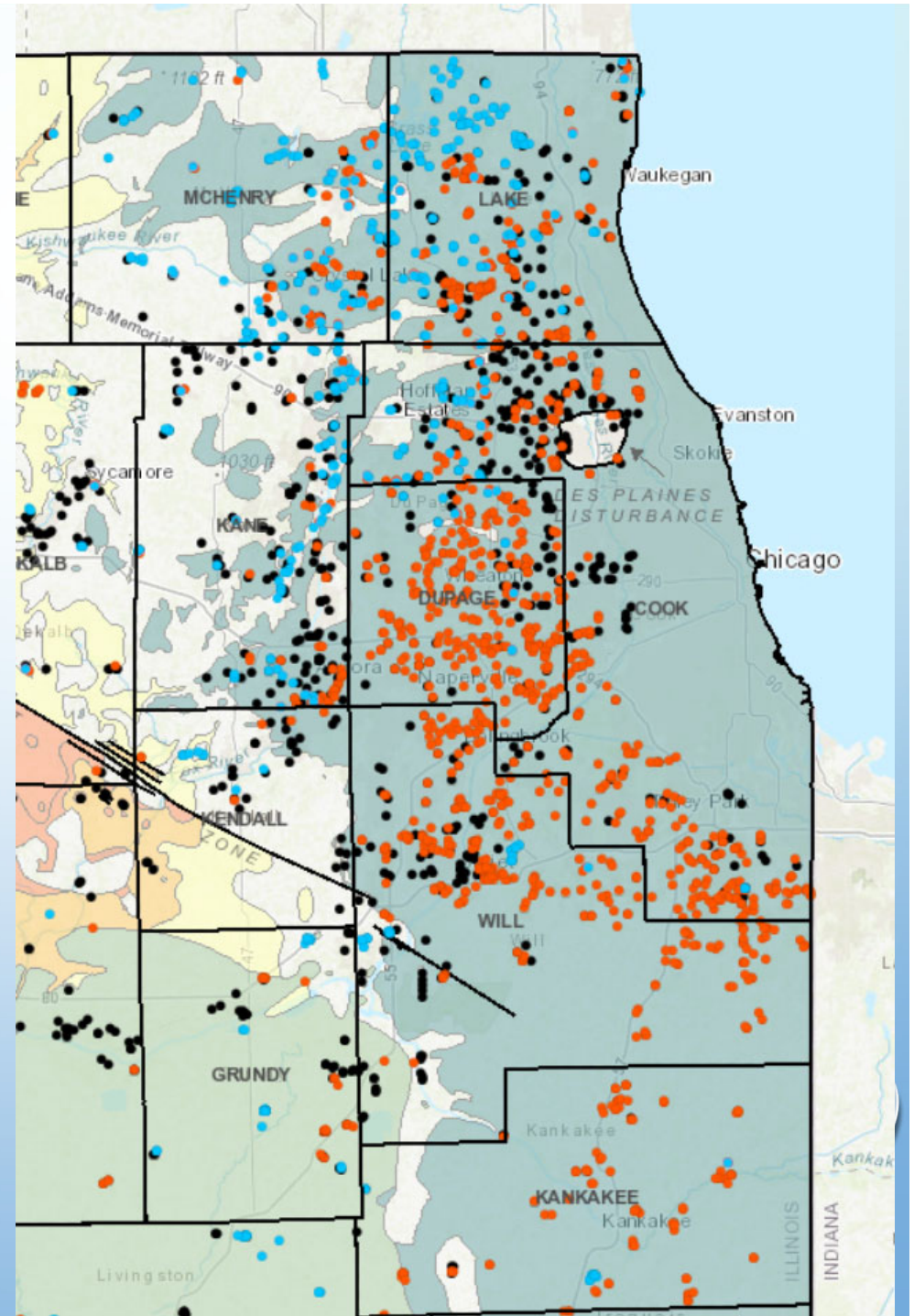


Carbonate Aquifer

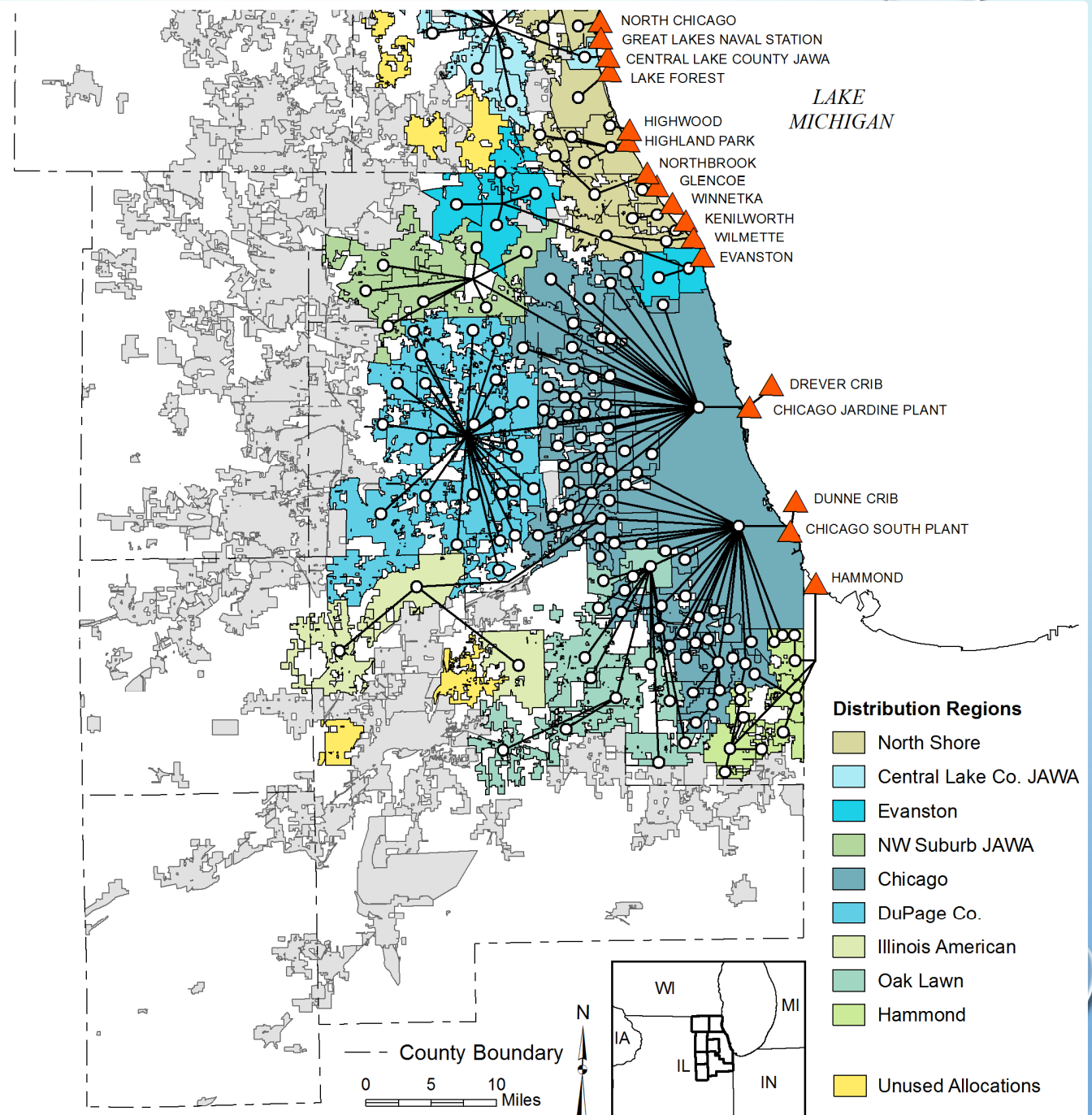


Public Water Supply Wells

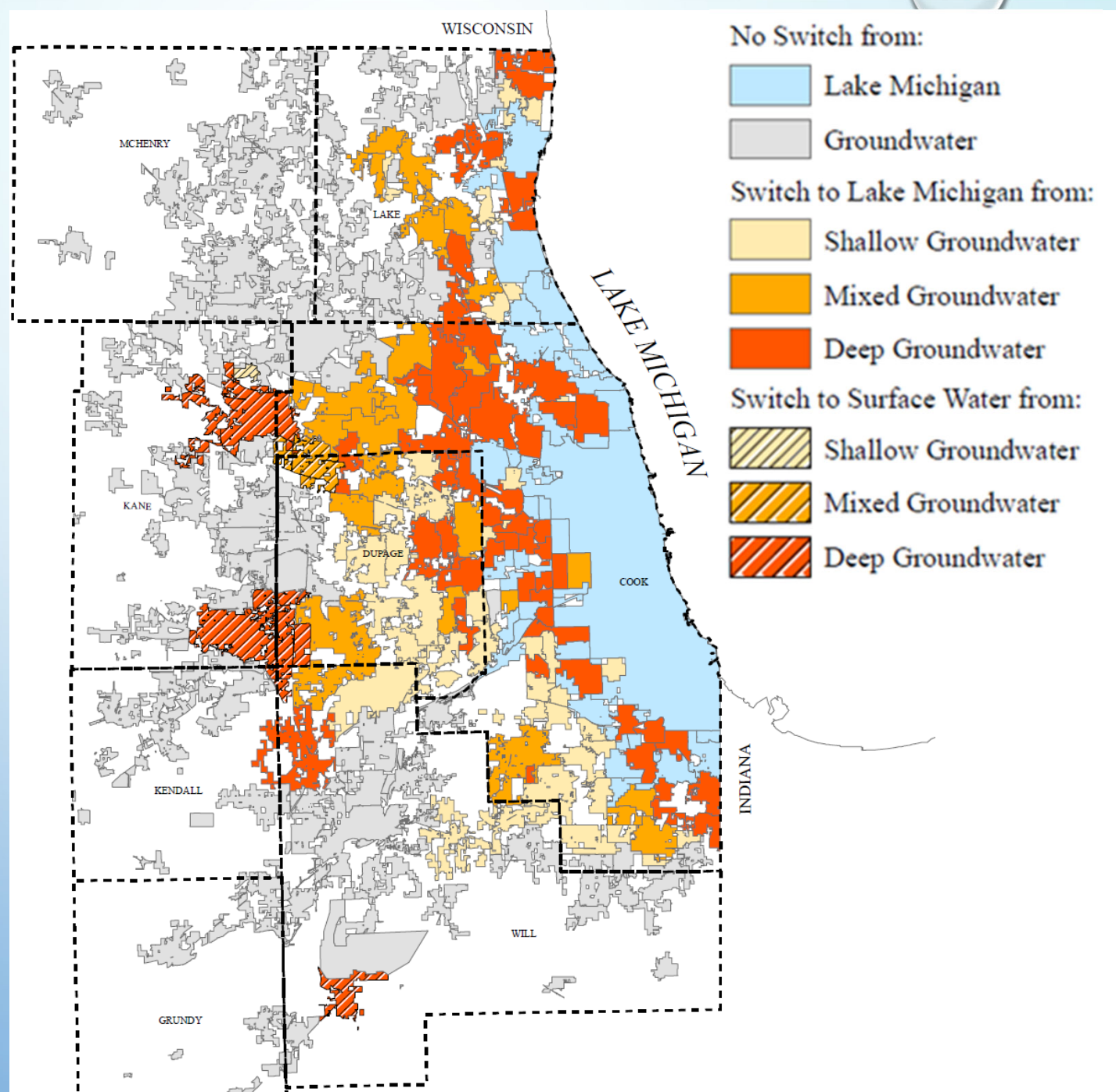
- Sand and Gravel Wells
- Shallow Bedrock Wells
- Sandstone Wells



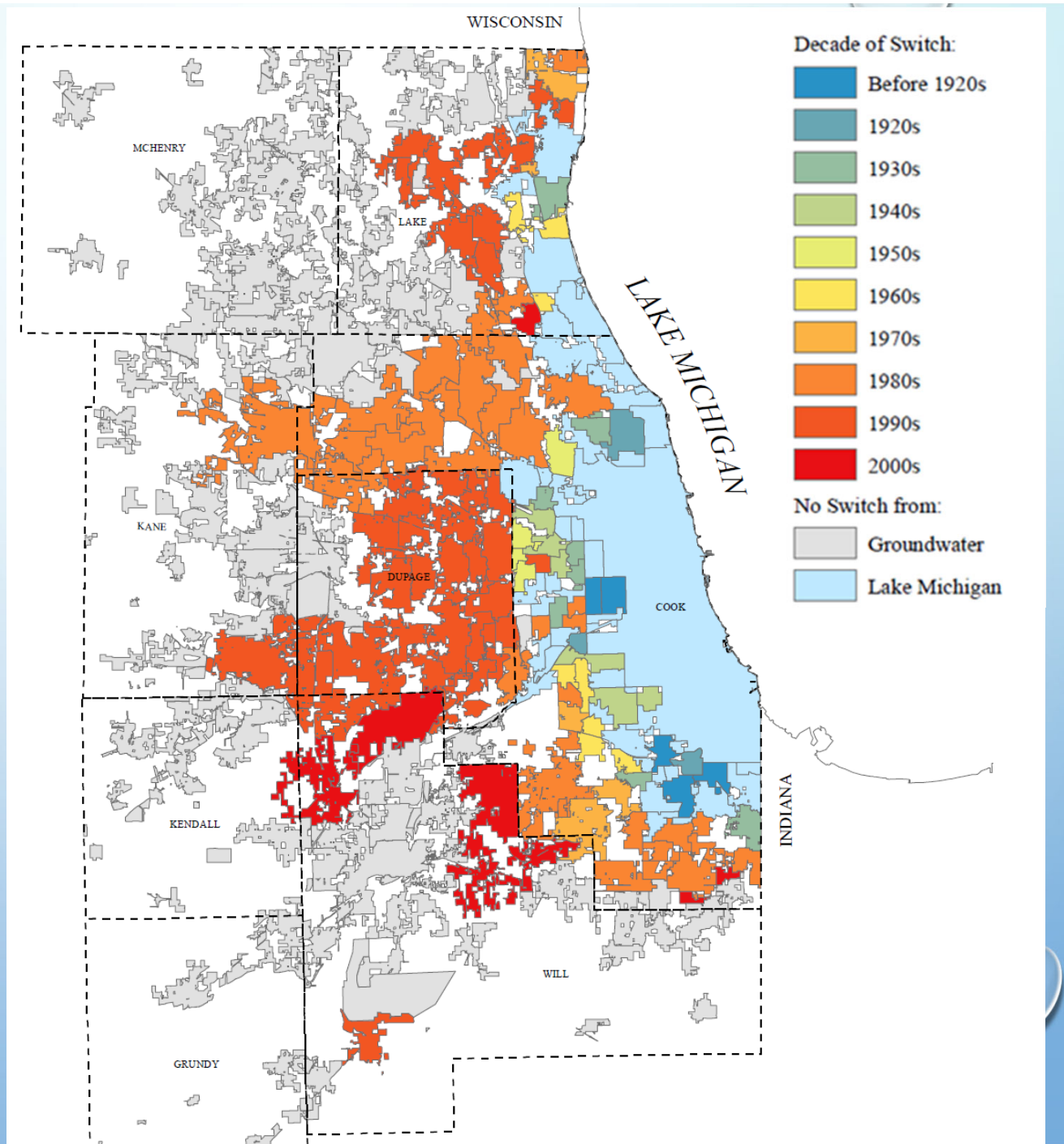
Distribution Network for Lake Michigan Water



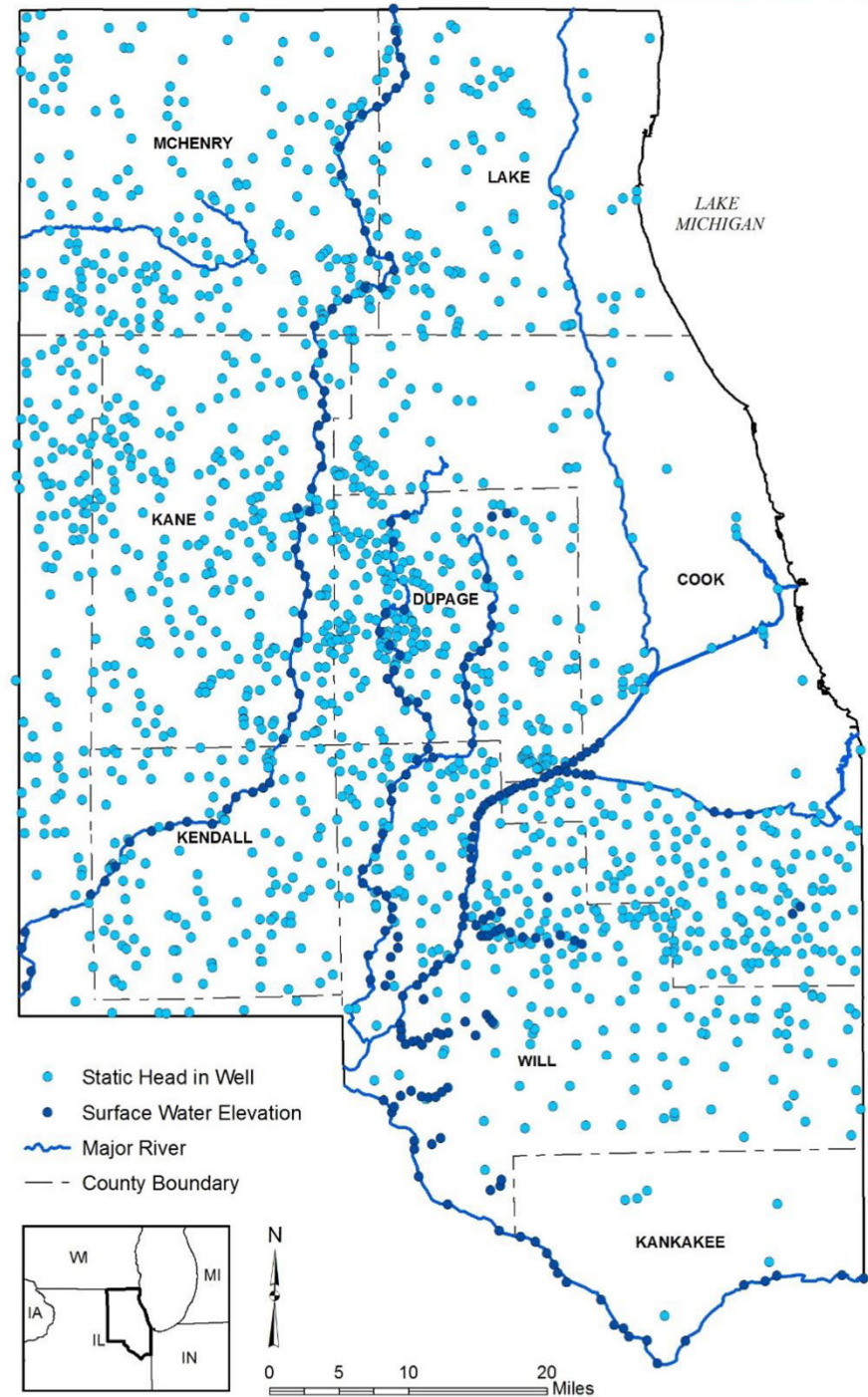
Communities that Switched from Groundwater to Lake Michigan or Surface Water



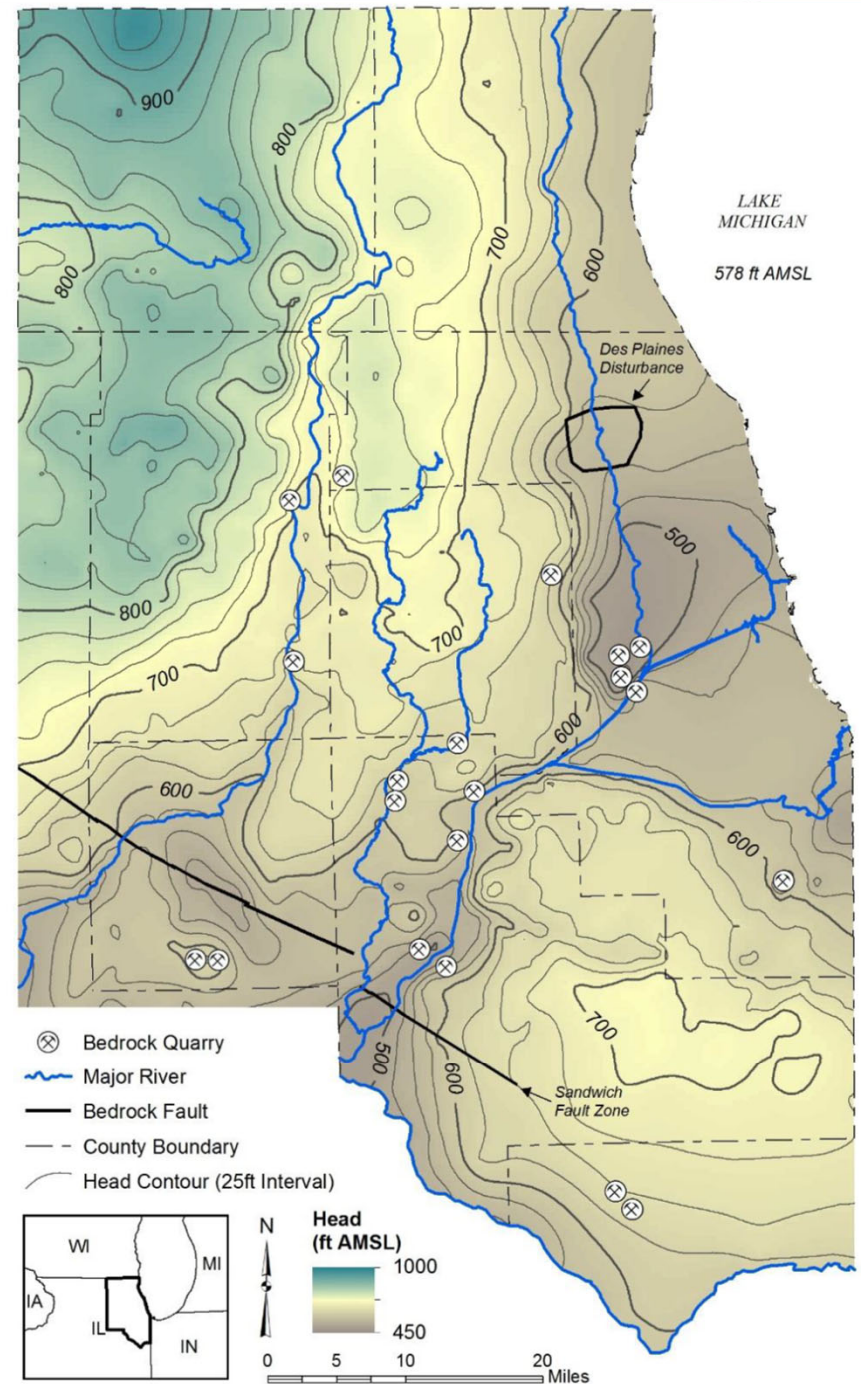
Switch in Water Source by Decade



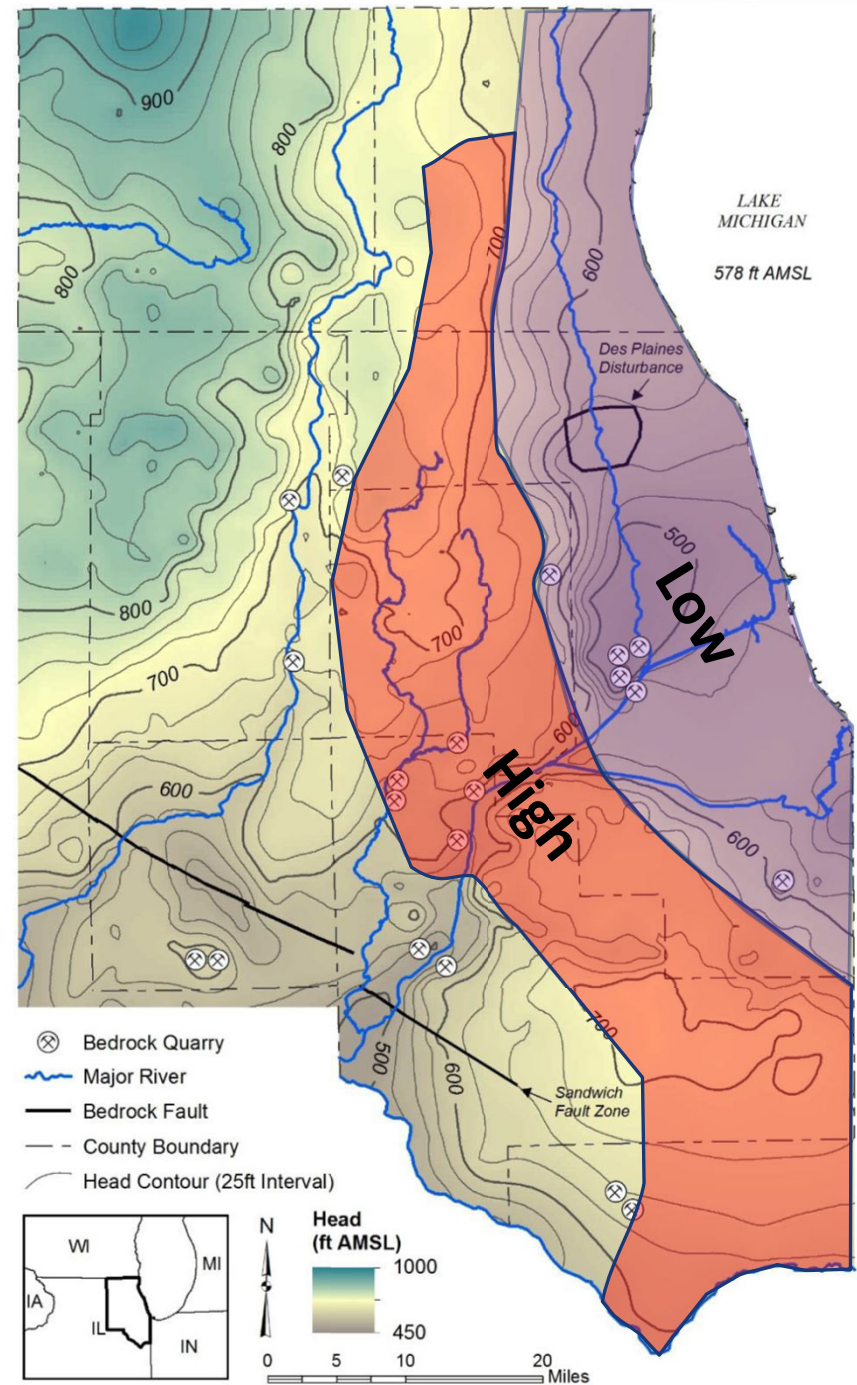
Mass Measurements of Water Levels in the Shallow Bedrock



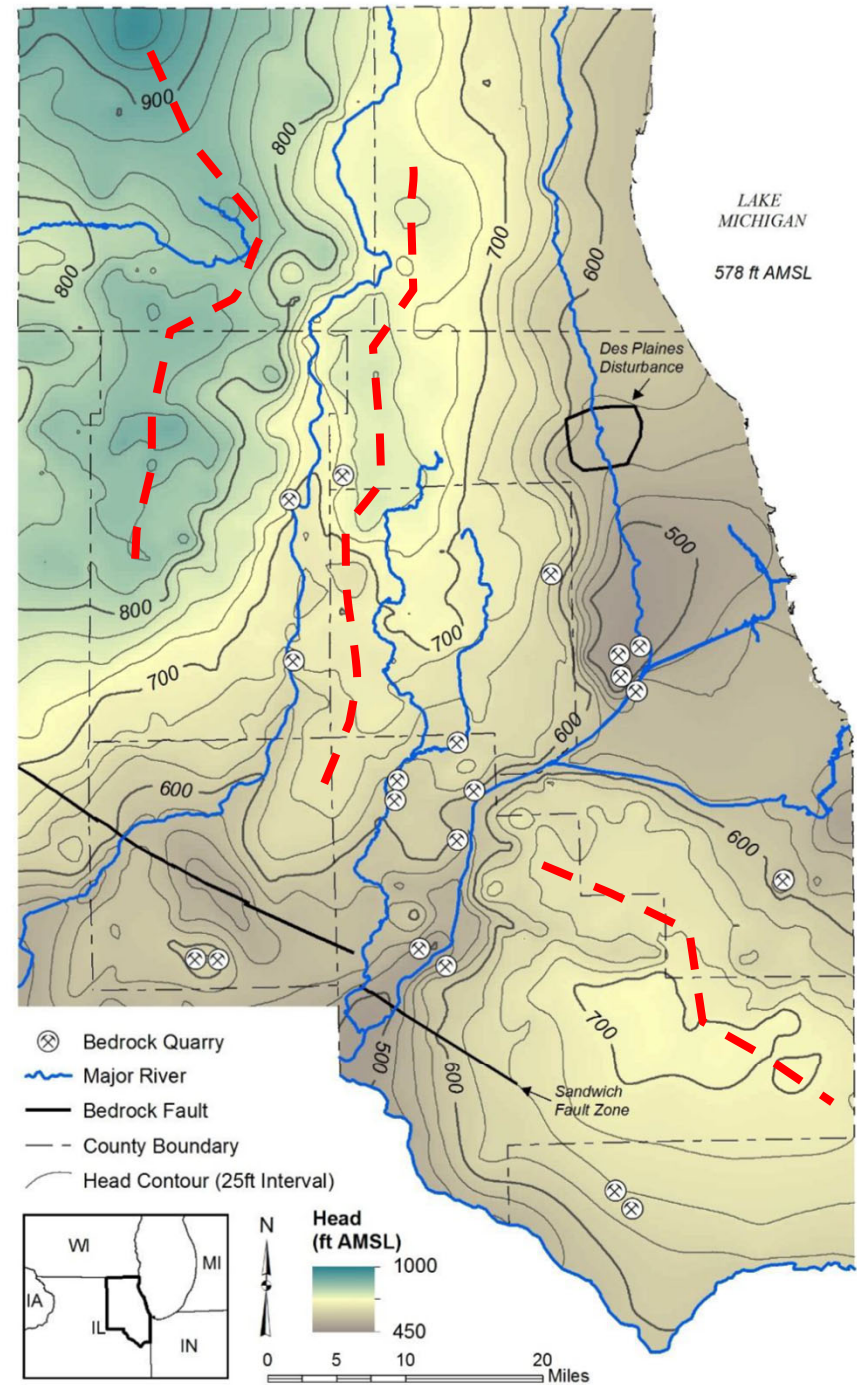
Potentiometric Surface of the Silurian Dolomite/Shallow Bedrock System



Approximate High and Low Permeability Zones



Principal Groundwater Divides



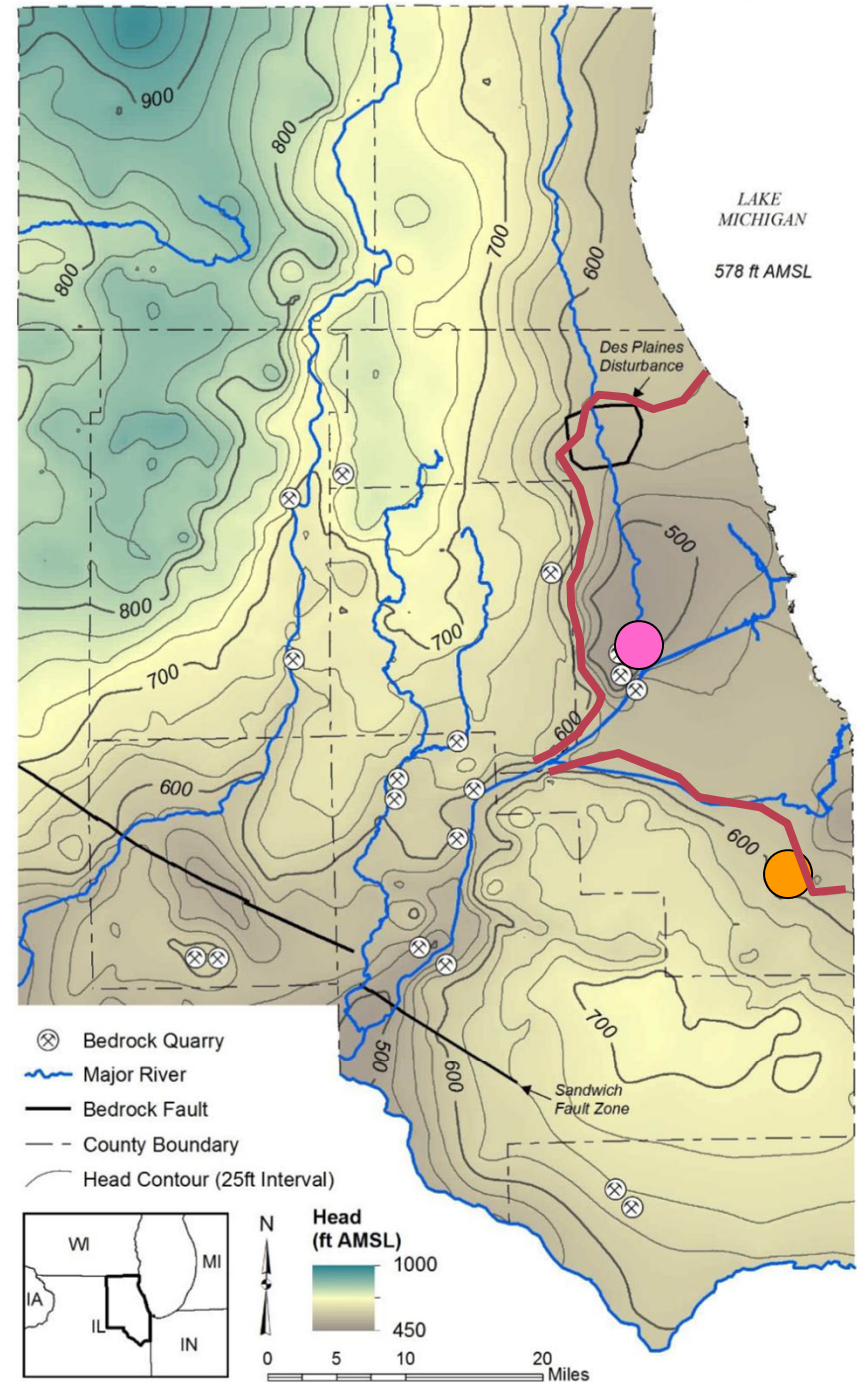
Cones of Depression:

- Quarries
- TARP Tunnels
- Kendall County

— 580

● McCook Quarry

● Thornton Quarry



Potentiometric Surface of the Silurian Dolomite 1934 and 1960

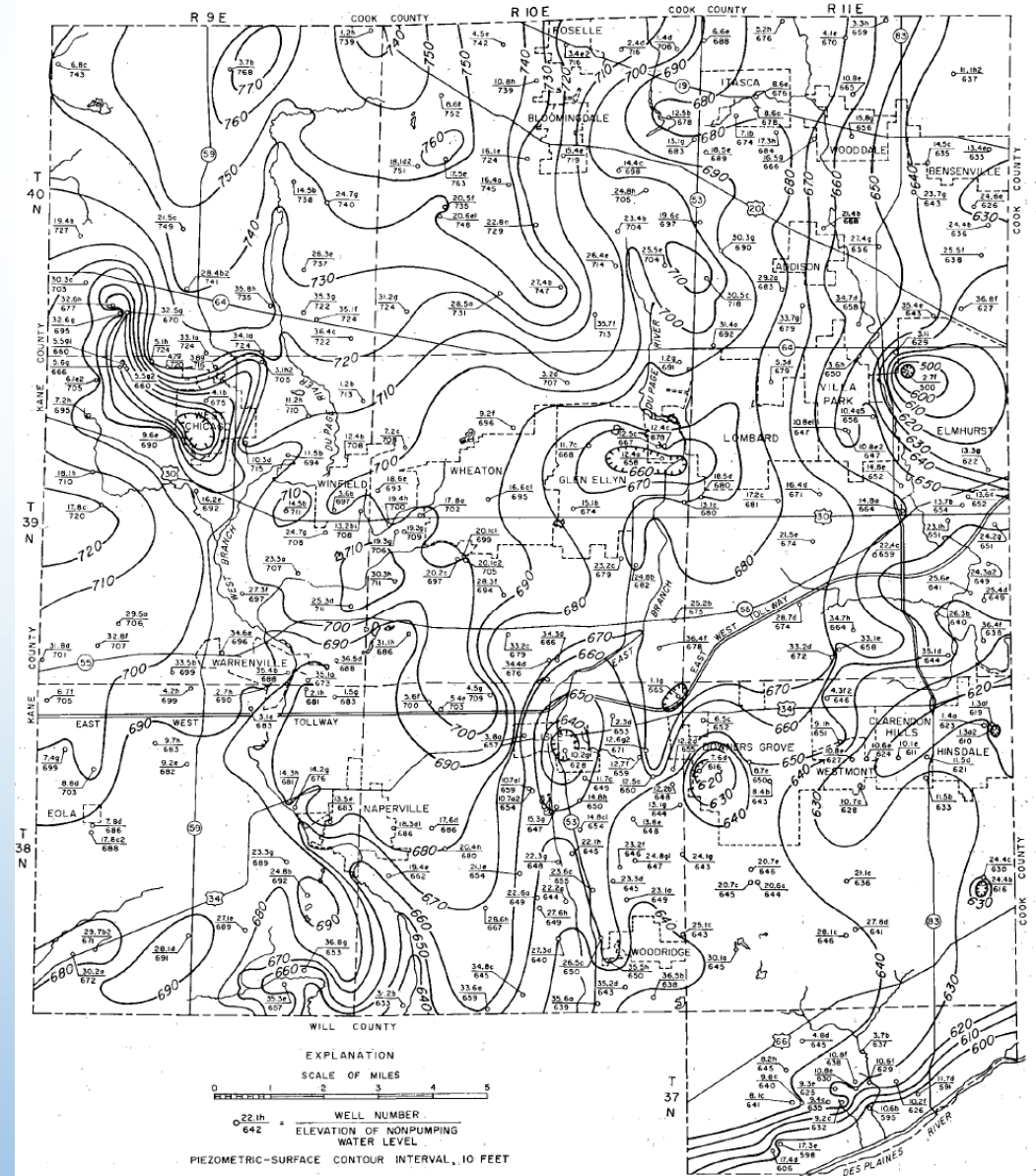
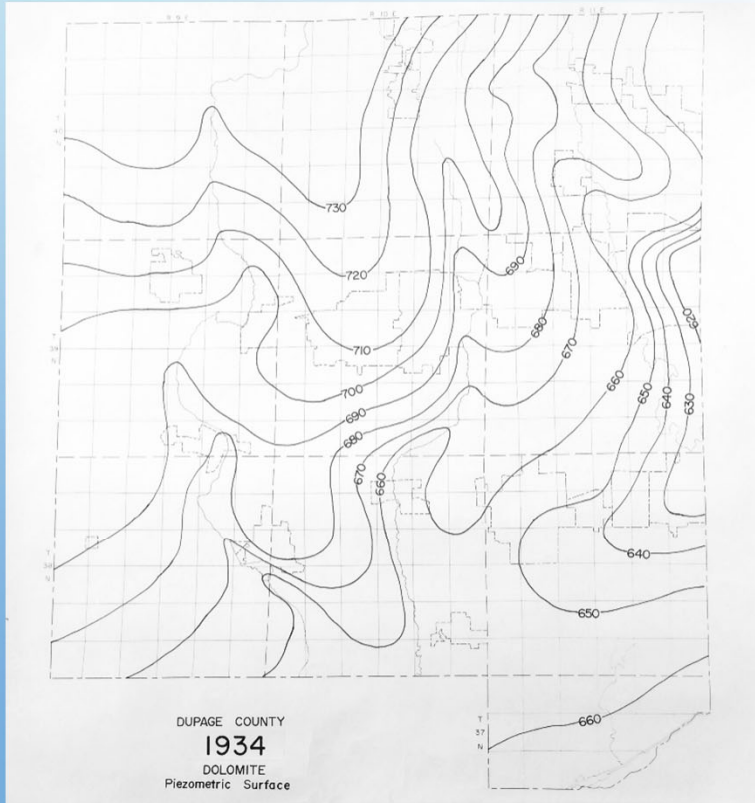
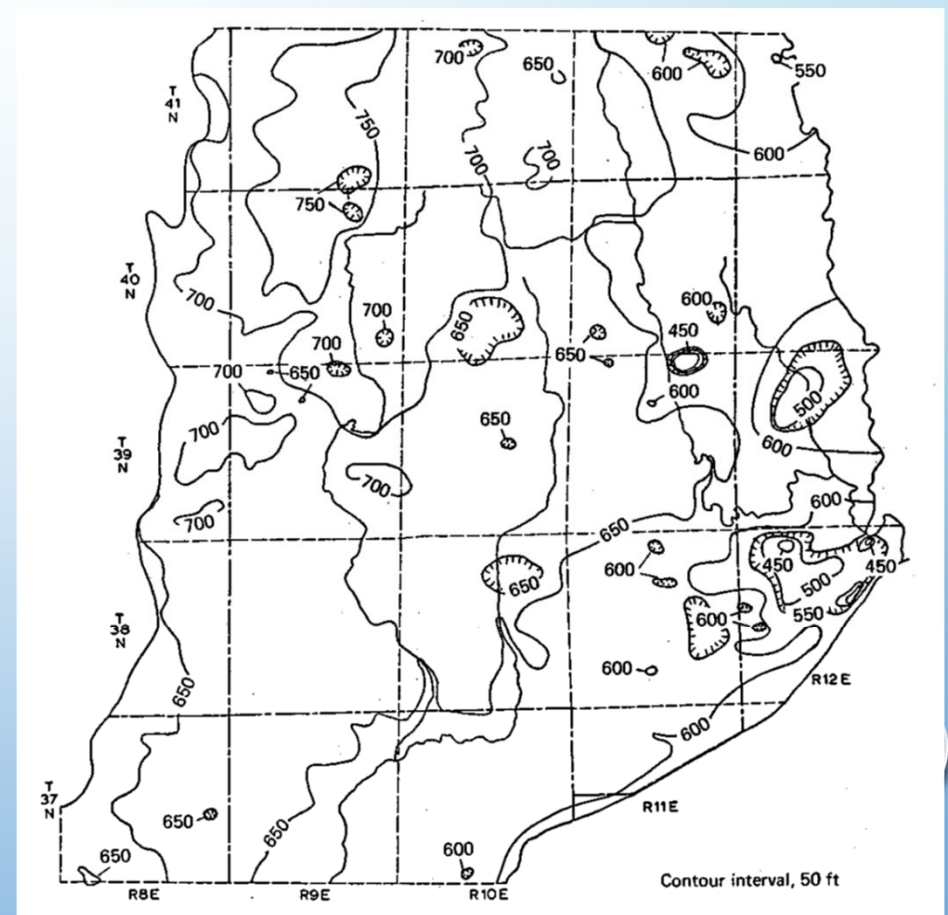
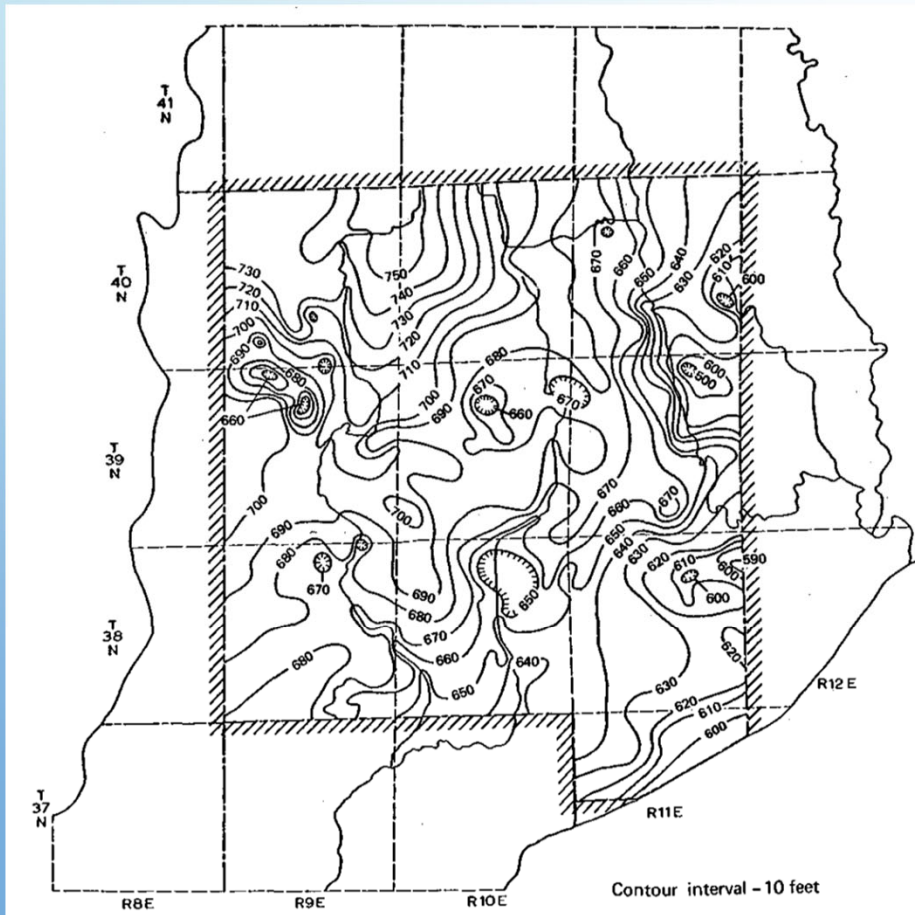


Fig. 52. Piezometric surface of Silurian dolomite aquifer, August 1960.

Potentiometric Surface of the Silurian Dolomite 1966 and 1979

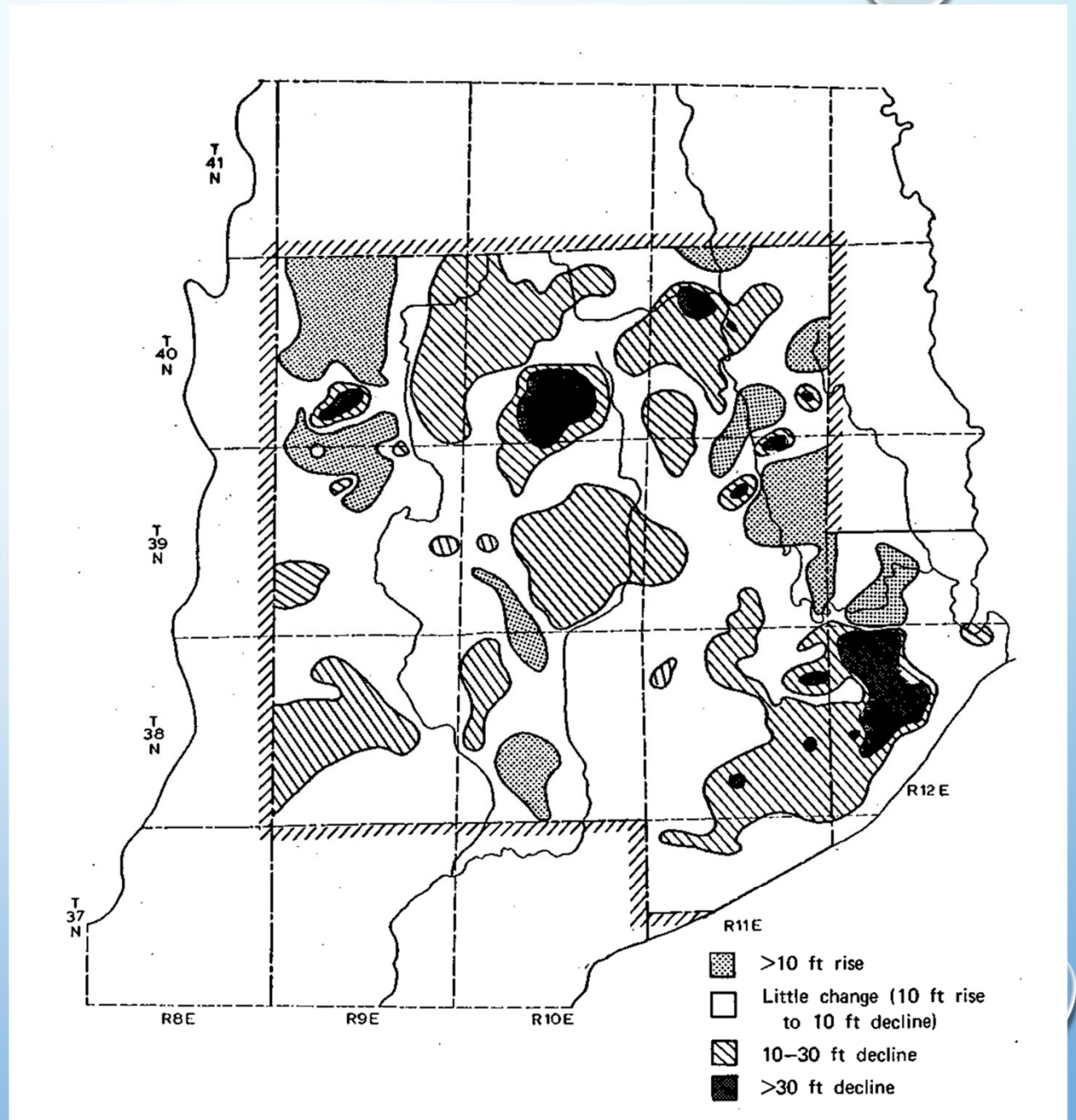
Pumpage – 24 MGD

Pumpage – 45 MGD



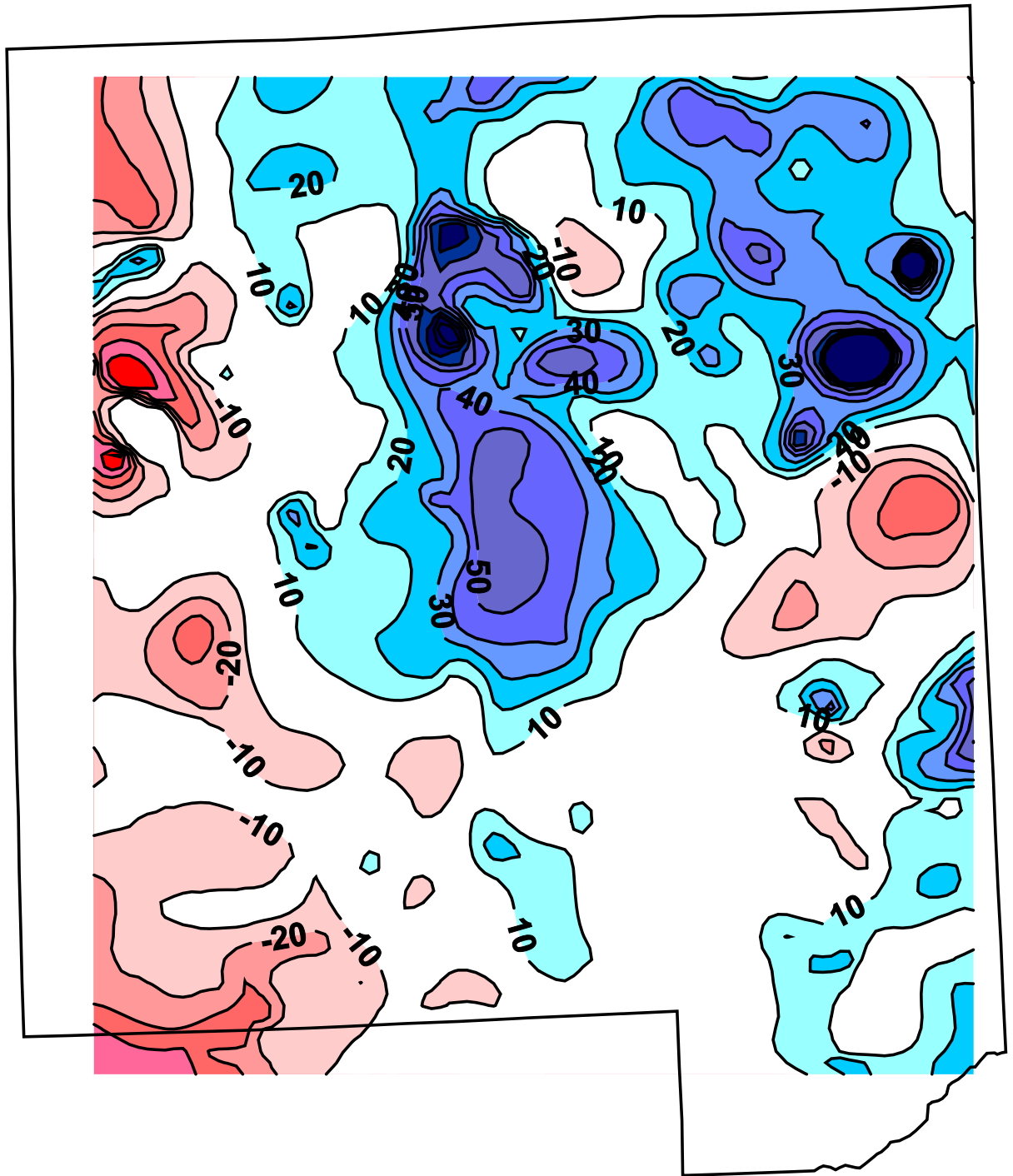
Sasman et al, 1980

Head Change from 1966 to 1979



Head Change from 1979 to 2002

Recovery
Drawdown



Groundwater Contamination in the Chicago Area

How Well Protected Are Confined Aquifers in Illinois?

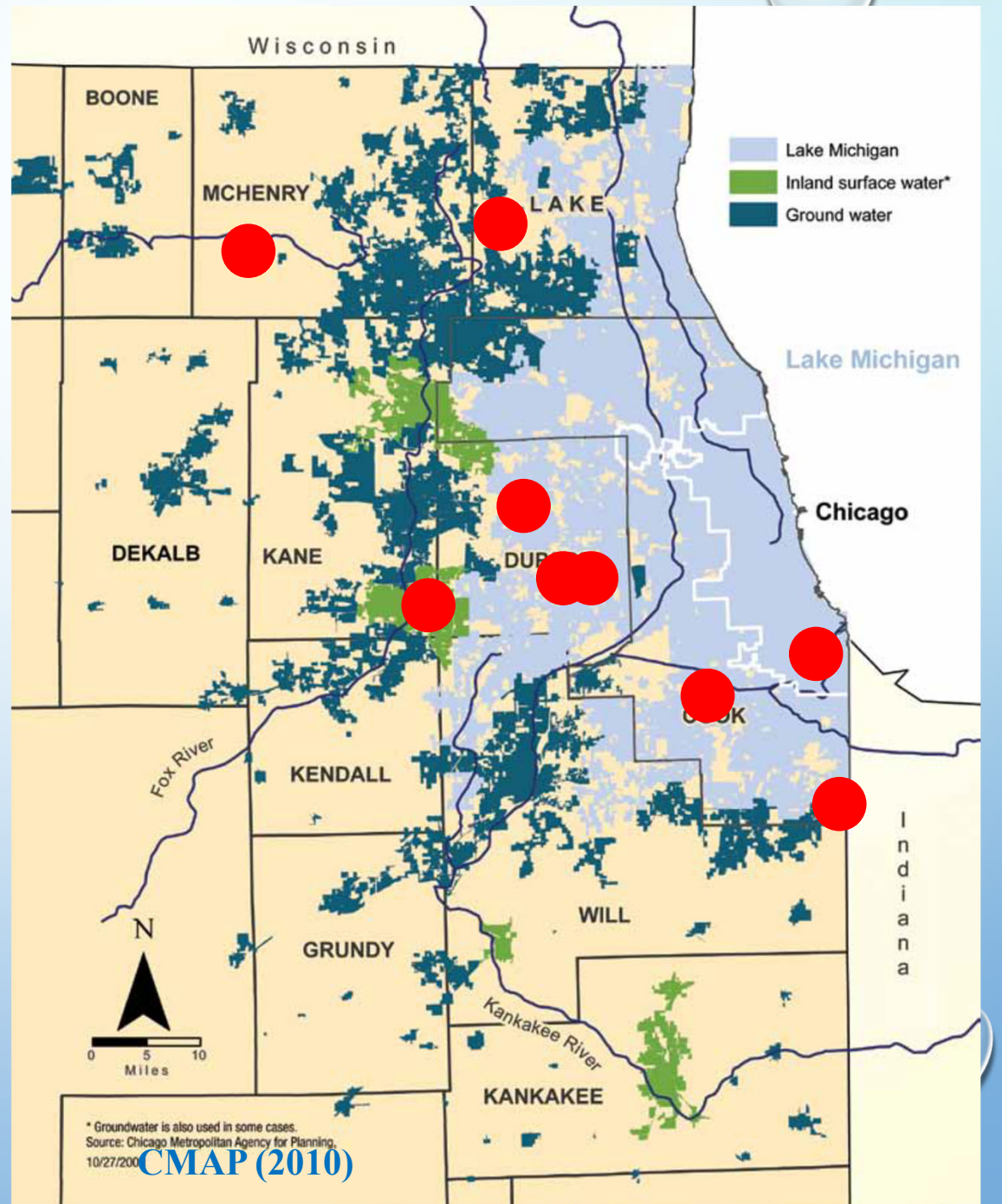
Do thick overlying glacial clays prevent contamination?

- Natural short circuits
- Man-made short circuits
- Water quality evidence – Silurian Dolomite Aquifer

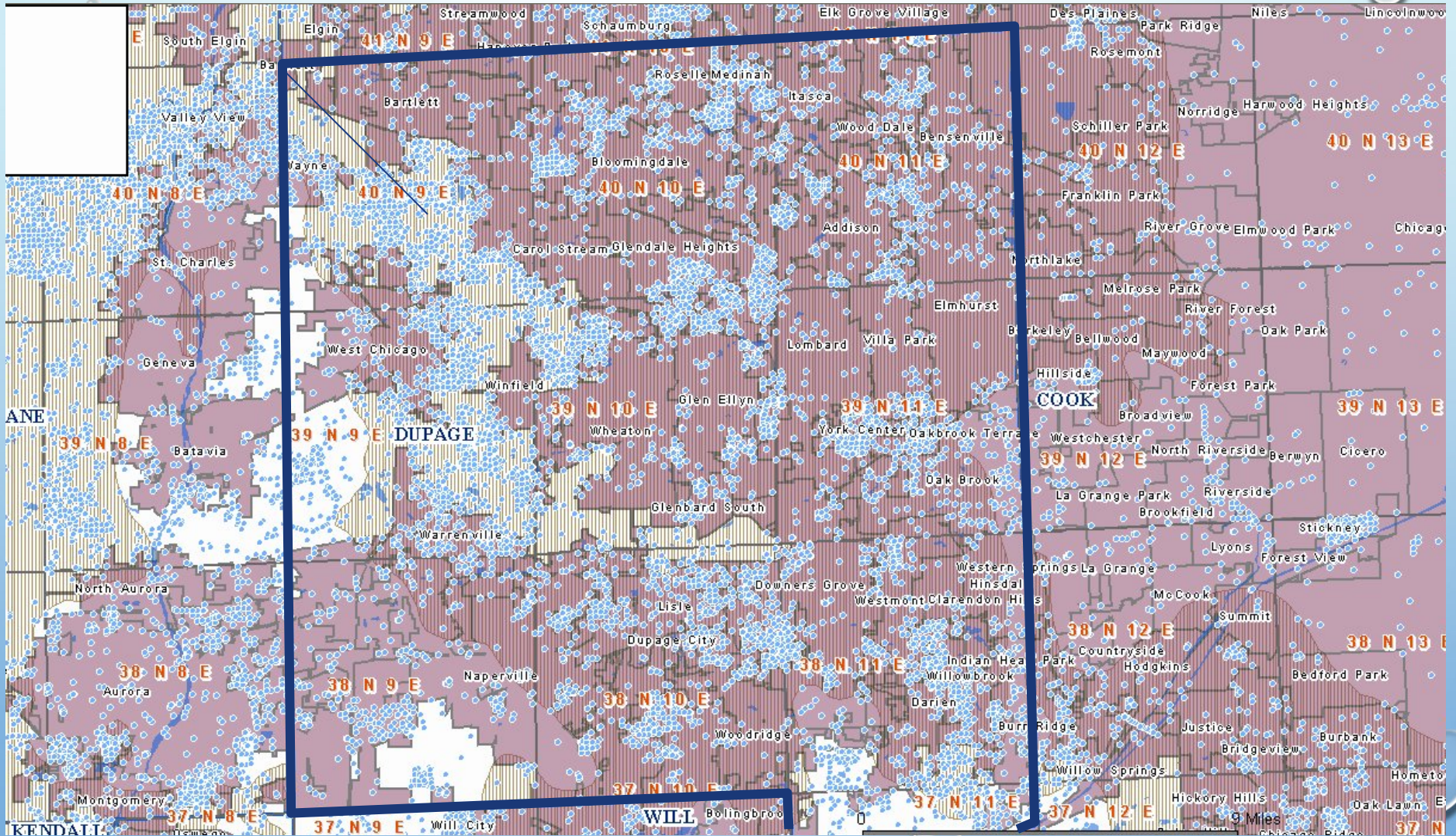
Selected Contamination Sites in the Silurian Dolomite Aquifer

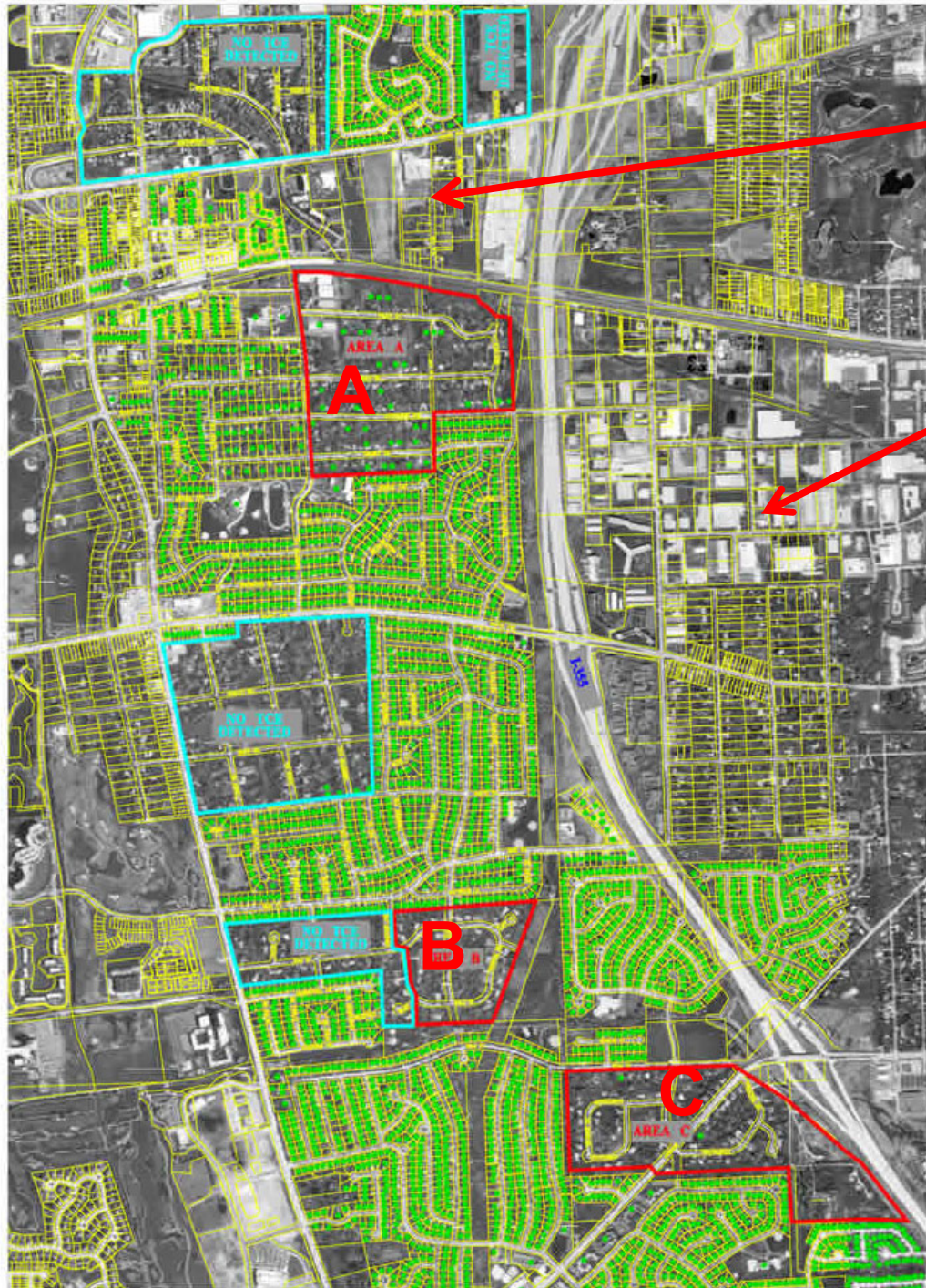
Hanover Park
Lisle
Downers Grove
Crestwood
Sauk Village
Montgomery
Lake Calumet

Wauconda
Marengo



Water Wells in DuPage County





**Lockformer
trichloroethylene (TCE)
contamination site, Lisle**

**Ellsworth Industrial Park
TCE and PCE site,
Downers Grove**

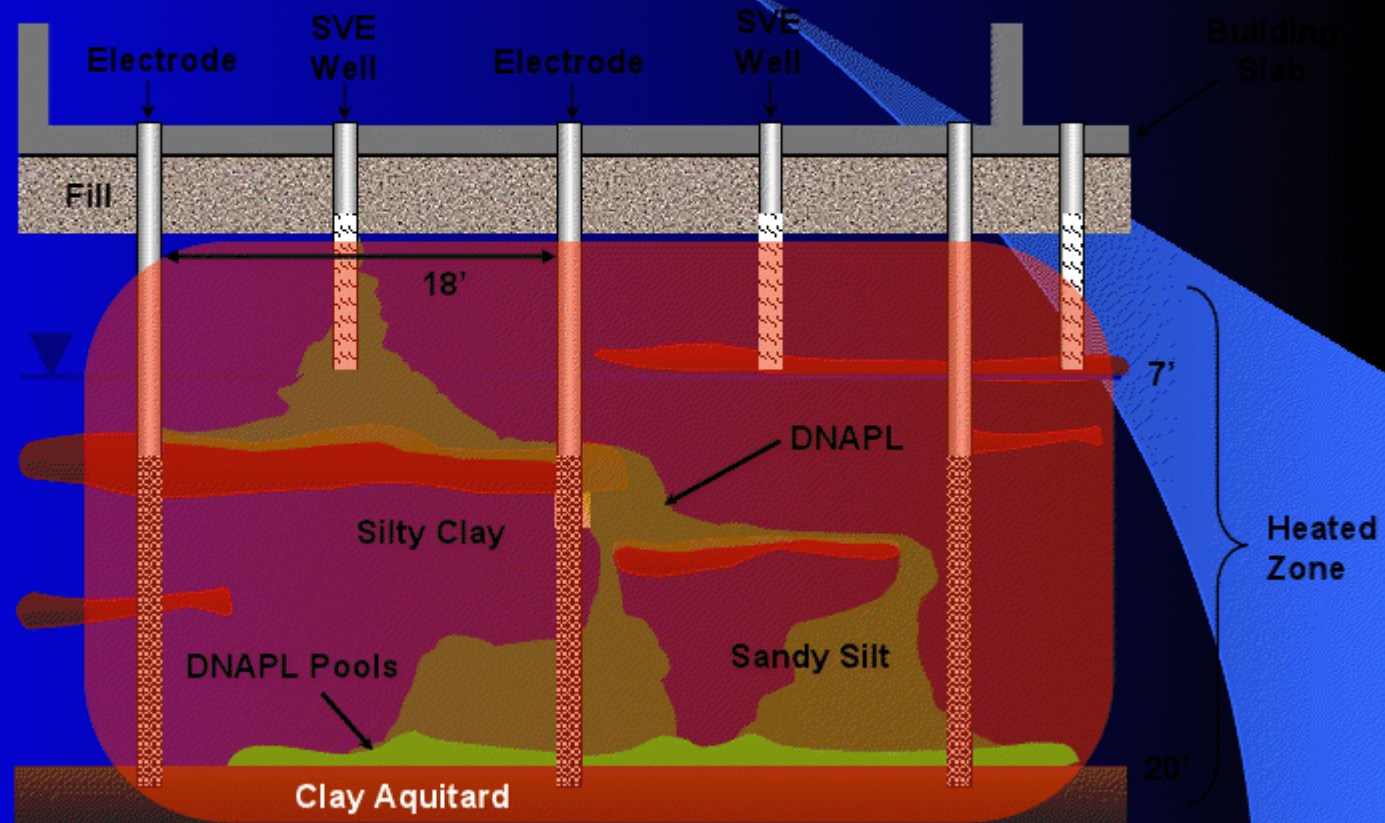
**Private wells
contaminated with
TCE**

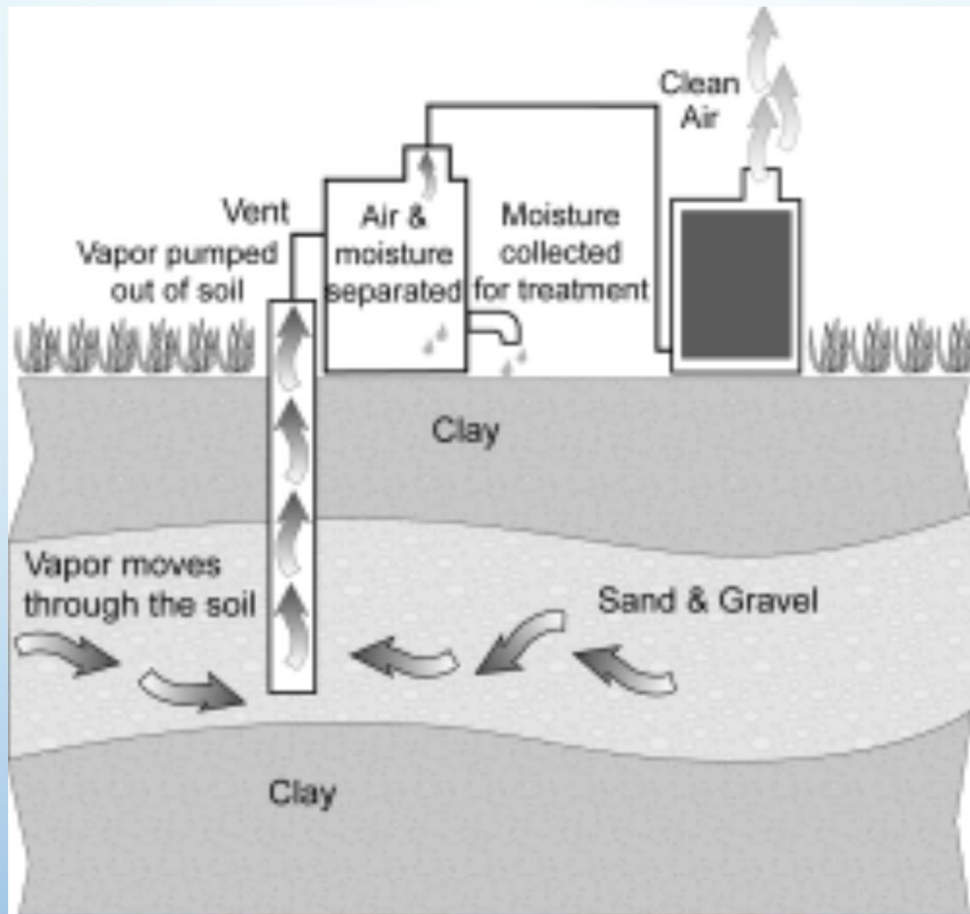
Area A: 37 of 83

Area B: 40 of 53

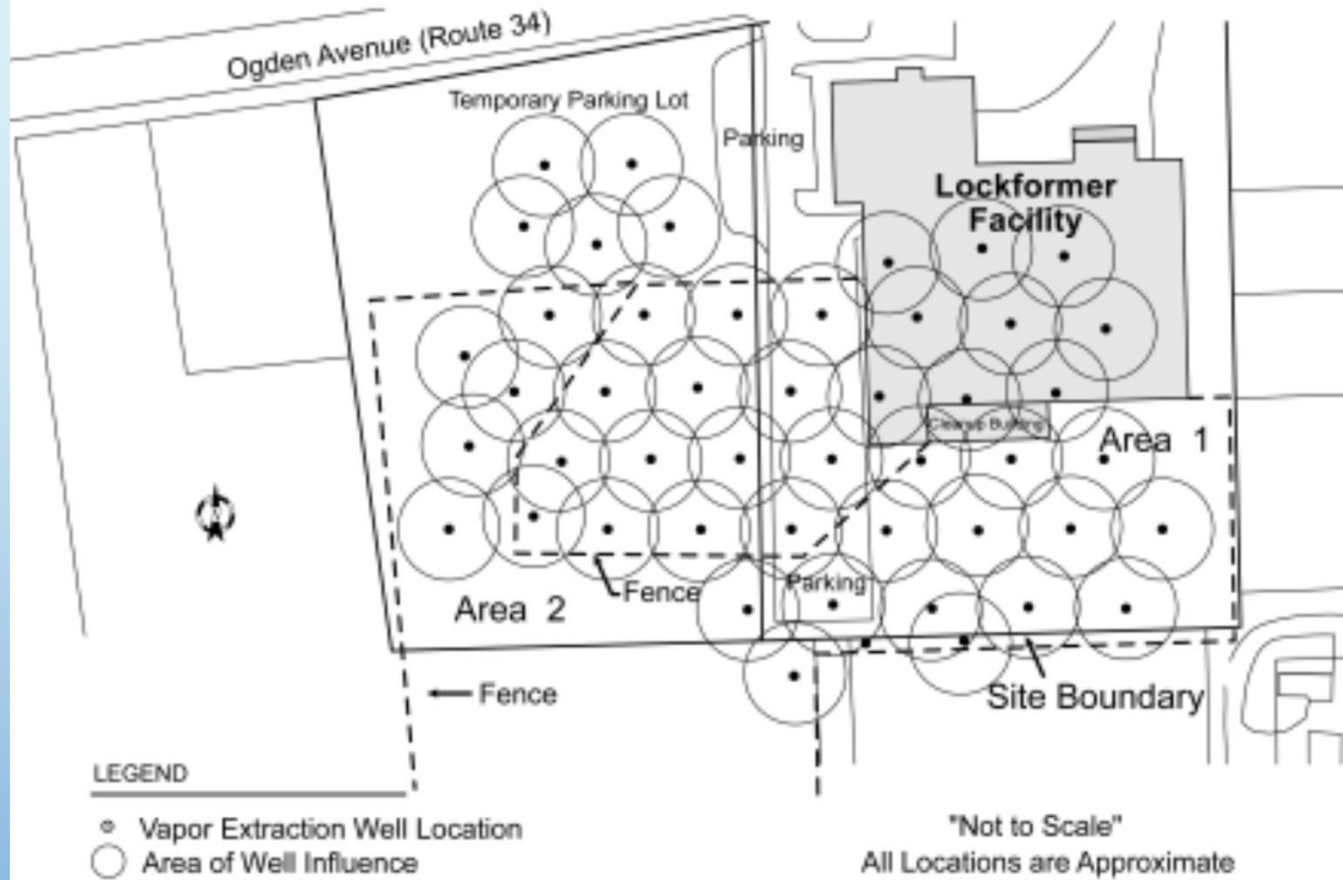
Area C: 64 of 99

Full-Scale DNAPL Cleanup Subsurface Cross-Section

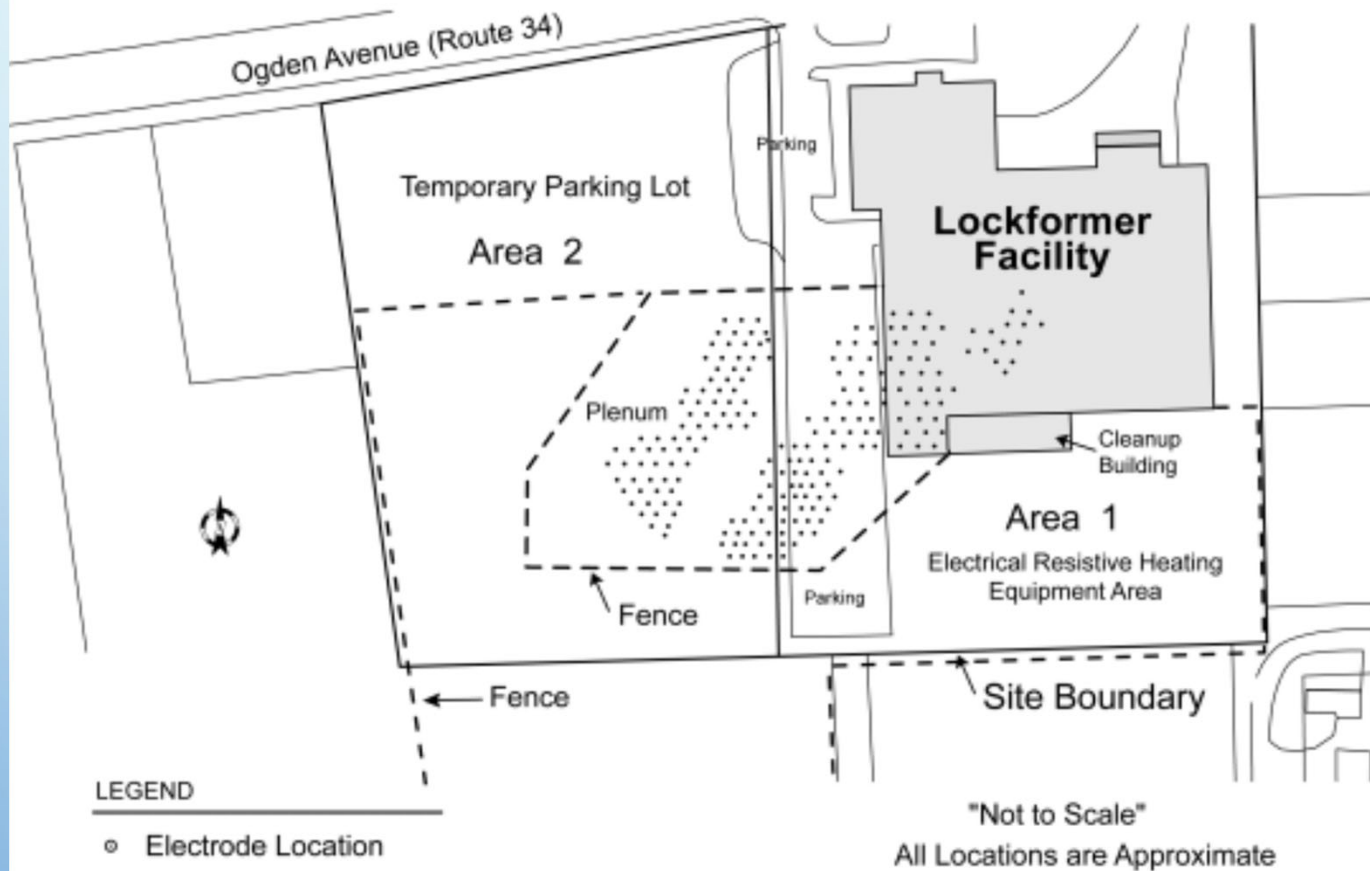




Soil Vapor Extraction Diagram

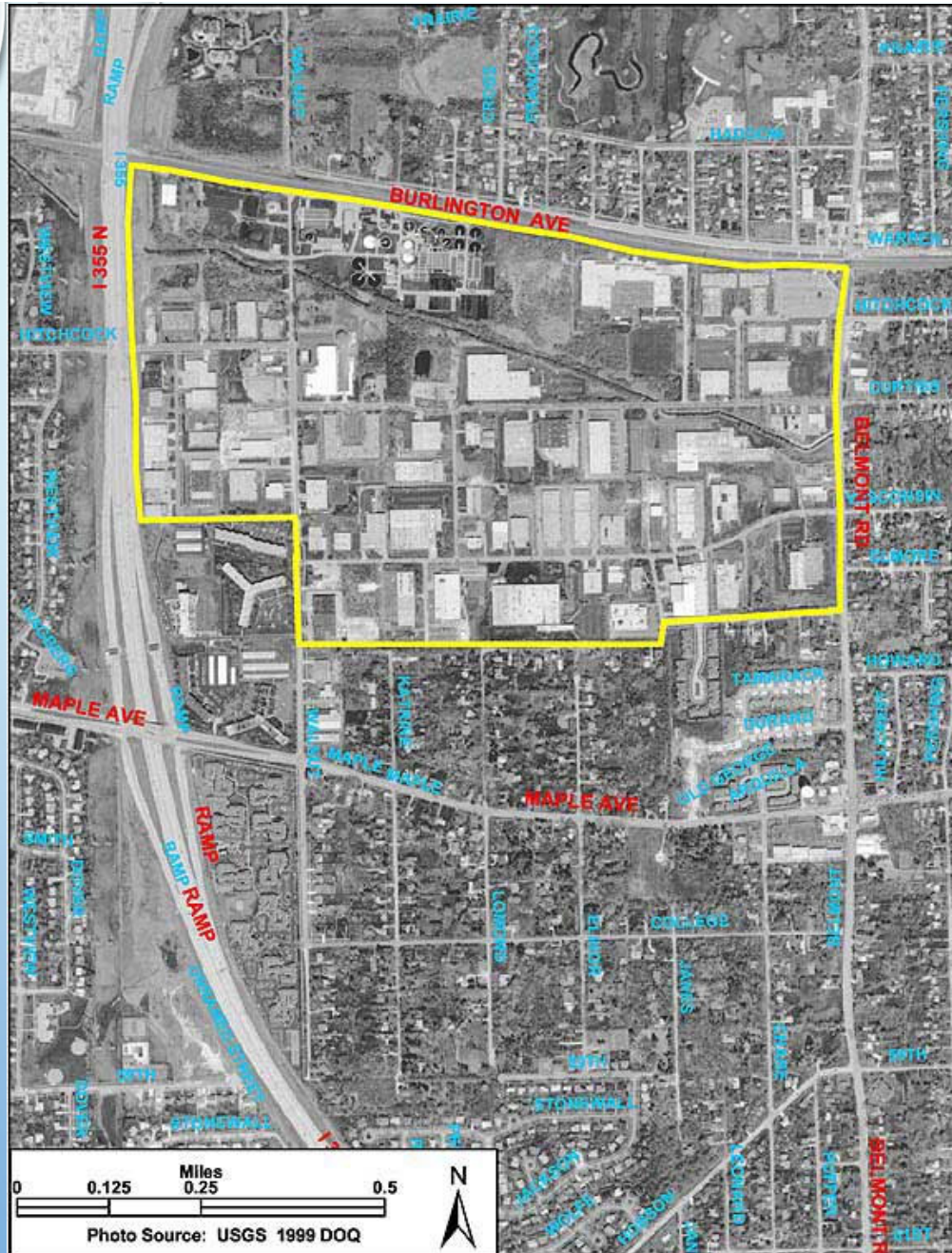


Electrical Resistive Heating Diagram





Ellsworth Industrial Park Park Downers Grove, IL



Source Area Investigation for Downers Grove Groundwater Contamination

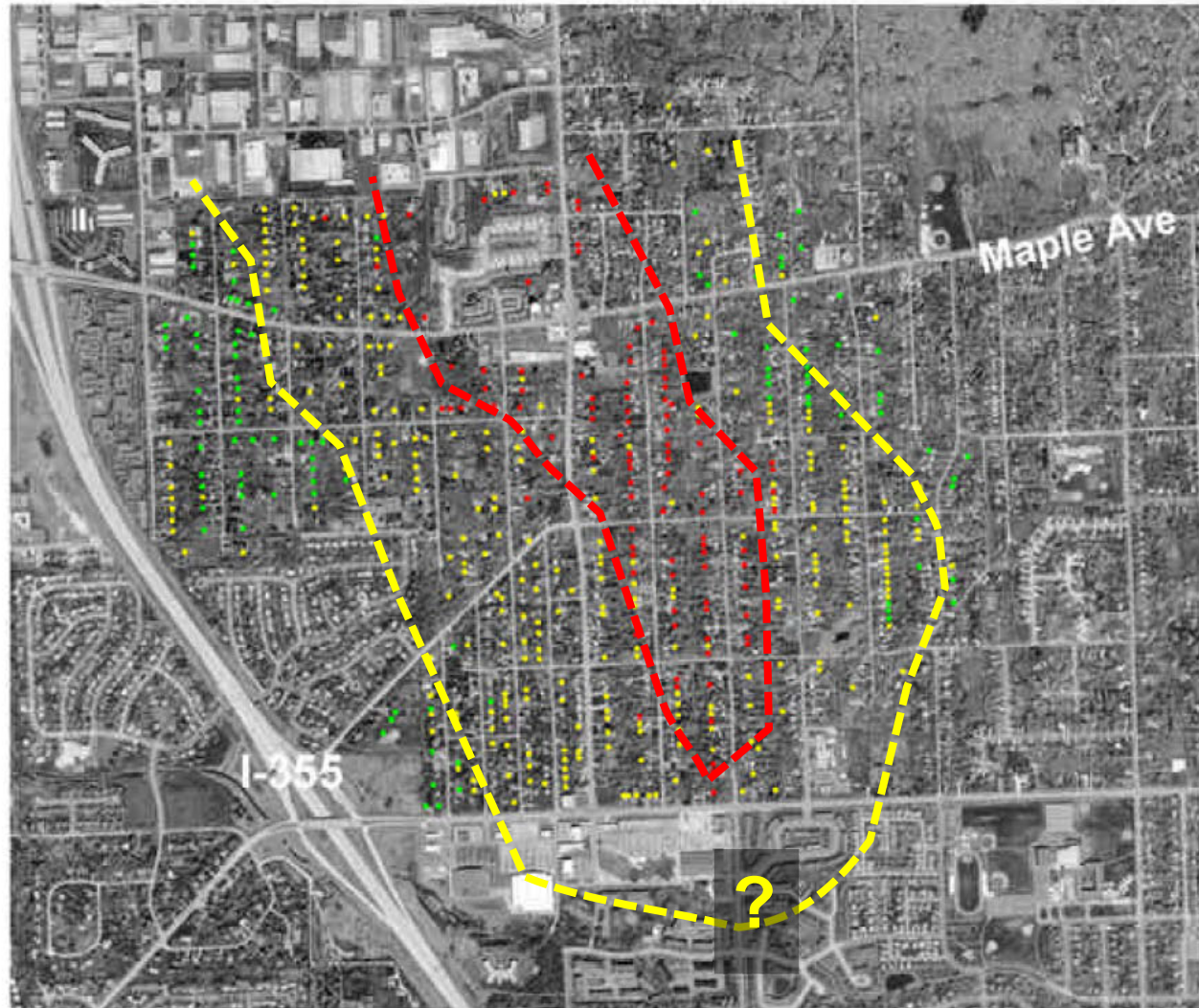
Prepared by Illinois EPA July 2002

TCE Plume (trichloroethylene)



Ellsworth Industrial Park Site Downers Grove, Illinois

TCE Concentrations in Residential Wells



LEGEND	
TCE Concentration (ppb)	
●	Nondetect
●	< 5
●	5 +

0.6 0 0.6 Miles

tdrexler/FIELDS/121202



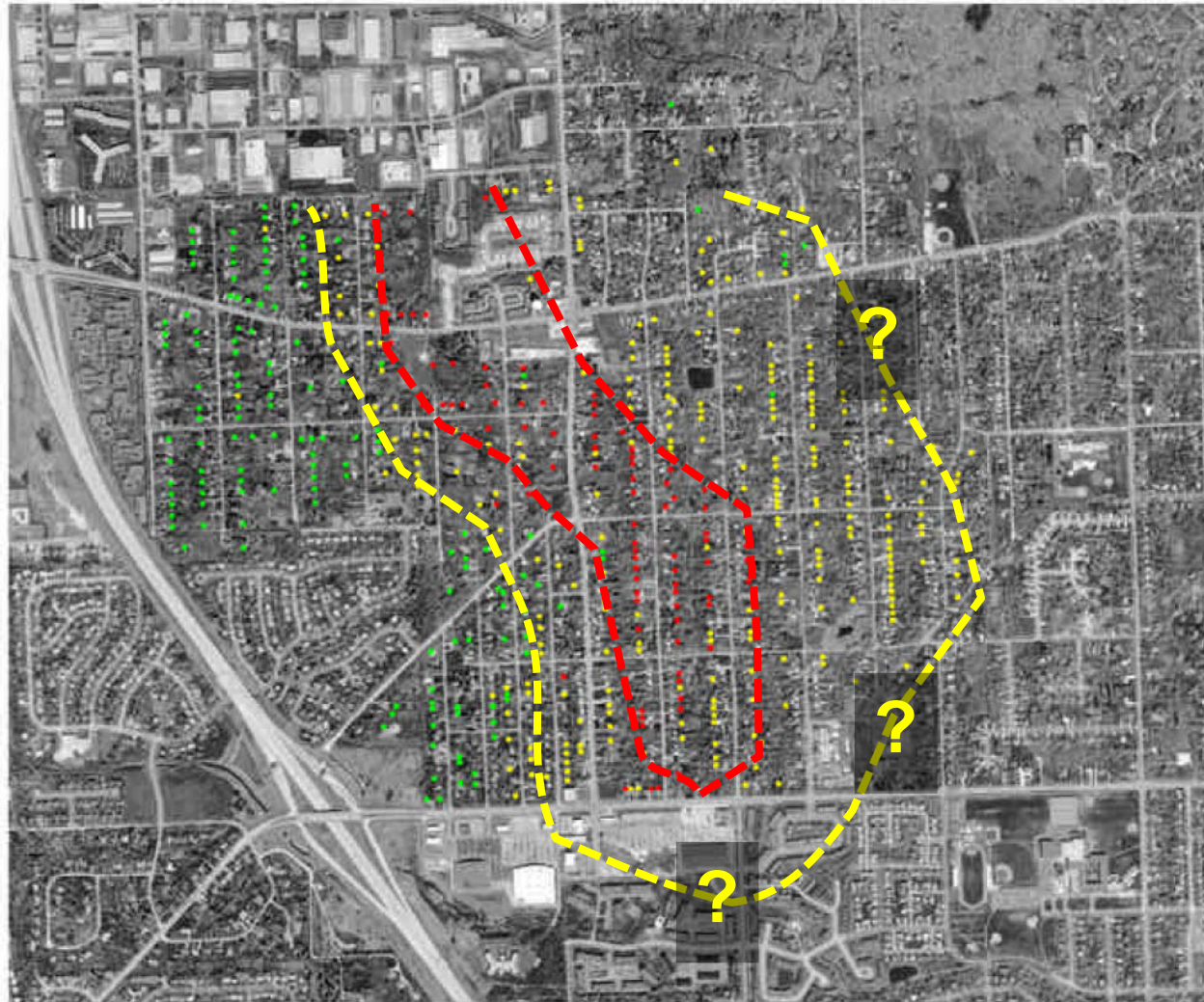
USEPA/EPA

PCE Plume (perchloroethylene)



Ellsworth Industrial Park Site Downers Grove, Illinois

PCE Concentrations in Residential Wells



LEGEND	
PCE Concentration (ppb)	
●	Nondetect
●	< 5
●	5 +



Well log in Downers Grove Plume

LOG OF WATER WELL

AS 718

Property owner Briarcliff Well No. _____

Drilled by Neely Year 1959

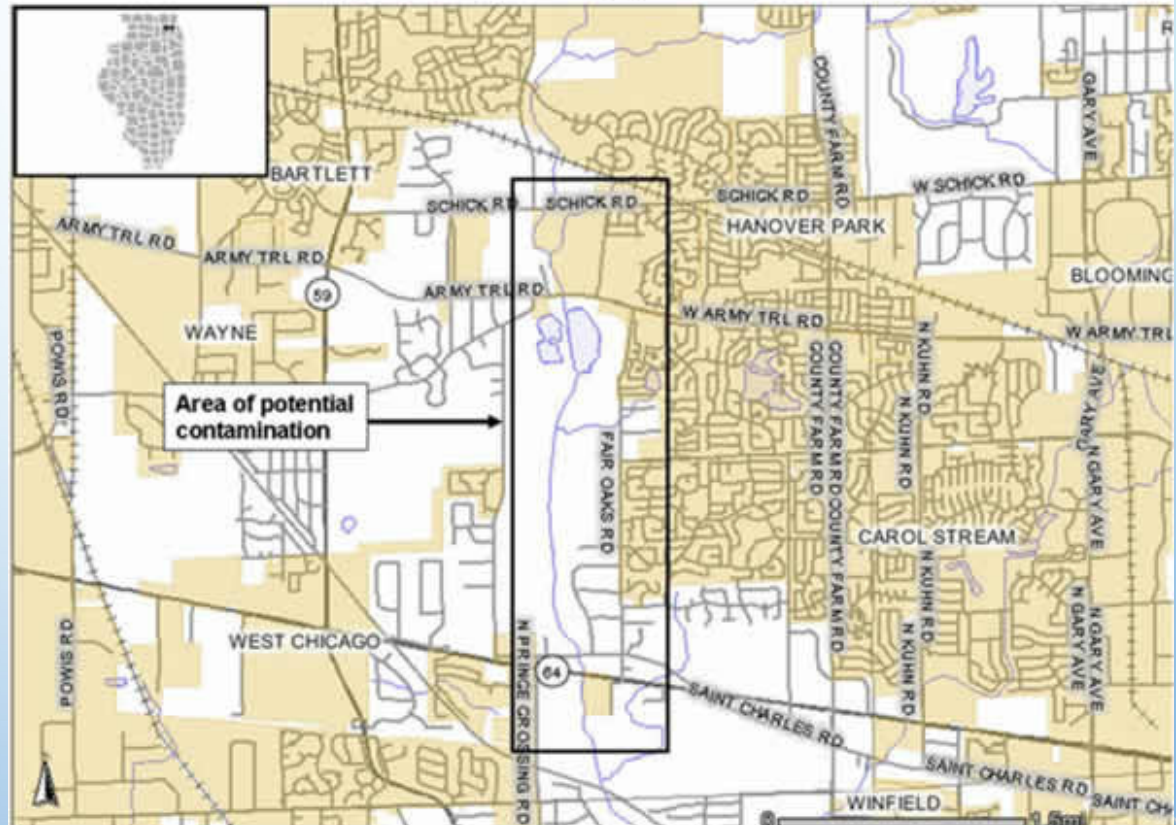
Formations passed through	Thick-ness	Depth of Bottom
Soil	2	2
Clay	85	87
Gravel	15	102
Sand	6	108
Gravel	3	111
Limestone	54	165

Hanover Park DCE Contamination

ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
clay	0	38
hardpan	38	53
sand & gravel	53	62
clay	62	68
sand & gravel	68	109
limestone	109	155
Total Depth		155

Area of potential groundwater contamination In Wayne Township, DuPage County




The rectangle represents roughly an area of potential contamination where some wells have been tested for the presence of vinyl chloride or cis-1,2-dichloroethene.

Sauk Village Water Contaminated: Illinois EPA

Residents warned against drinking tap water as temperatures Tuesday could reach 100 degrees

By Lauren Petty | Tuesday, Jul 17, 2012 | Updated 11:16 PM CST

View Comments (5) | Email | Print  2  Tweet 6  Recommend 55  Send



AP

UPDATE: Anger, Not Water, Flows at Village Meeting...

As temperatures climbed Tuesday to an expected high of 100-102 degrees, residents in one suburban Chicago town were being advised against drinking tap water.

The Illinois Environment Protection Agency recently issued another warning for south suburban Sauk Village, saying the town's drinking water contains way too much of the gas vinyl chloride. The EPA reports water with low levels of the gas has been known to cause cancer.

That's an issue for anyone dealing with the latest

advertisement

SATURDAY, DEC. 8, 9AM - 5PM

OPEN

Sauk Village Well

60 ft of clay till

Illinois State Geological Survey
Urbana, Illinois
Indian Hill Utility Corp.
Sauk Village

T 35 N R 14E Sec. 25
Cook Co.

Elevation: 642' Est. T.M. Sample Set No. 34883
Drilled: 1959 by Wehling Well Works Studied 12/59 by G.H. Emrich

Geological System	Formation	Depth (ft)		Description	Notes	
		Start	End			
Pleistocene		5	5	Soil	Static Water Level 27' 12" I.D. Csg. 78'	
		15	20	Till, yellowish-buff		
		45		Till, gravel, grayish-brown		
		65				
SILURIAN	Waukesha	10	75	Gravel, sandy	12" Hole	
		30	105	Dolomite, silty, gray, little light gray and buff		
		35	140	Dolomite, cherty, silty, buff to buffish gray, very fine		
		45	185	Dolomite, very silty, gray, very fine		
		60	245	Dolomite, very silty, gray to grayish buff		
		25	270	Dolomite, buff to buffish-green, little orange		
SYSTEM	Joliet	55	325	Dolomite, light buff to light gray, very fine		
		35	360	Dolomite, slightly silty, light buff to light grayish buff		
		30	390	Dolomite, light gray, little light buff, very fine		
		25	415	Dolomite, light buff		
Kankakee		10	425	Dolomite, light buff to grayish buff		
		37	37	Dolomite, silty, buff to buffish-gray, very fine, speckled		
Maquoketa		13	13	475	Shale, green, tough; dolomite, buff	T.D.

From the archives: Poison in the well

APRIL 29, 2013

Read Tribune reports since 2009 on how Crestwood residents unknowingly drank tap water contaminated with toxic chemicals.



NEWS APRIL 29, 2013

Ex-official guilty in tainted water case

By MICHAEL HAWTHORNE, CHICAGO TRIBUNE REPORTER

A federal jury didn't hear from prosecutors about toxic chemicals in the drinking water of south suburban Crestwood. Or about higher-than-normal cancer rates in the working-class village.



BREAKING NEWS APRIL 11, 2013

Ex-Crestwood water operator pleads guilty in contamination case

By MICHAEL HAWTHORNE AND ANNIE SWEENEY

A state inspector visiting south suburban Crestwood in 2007 had a question for one of its top water officials: How could the village have pumped out more water than it had claimed to purchase from nearby Alsip?



BREAKING NEWS AUGUST 11, 2011

Feds indict 2 over tainted Crestwood well

By MICHAEL HAWTHORNE

Unwilling to fix leaky water mains in Crestwood, a south suburb known for its penny-pinching ways, village leaders secretly supplemented their supplies for more than two decades with a community well they knew was contaminated with cancer-causing chemicals.



HEALTH DECEMBER 10, 2010

Crestwood reaches deal in tainted drinking water lawsuit

By MICHAEL HAWTHORNE, TRIBUNE REPORTER

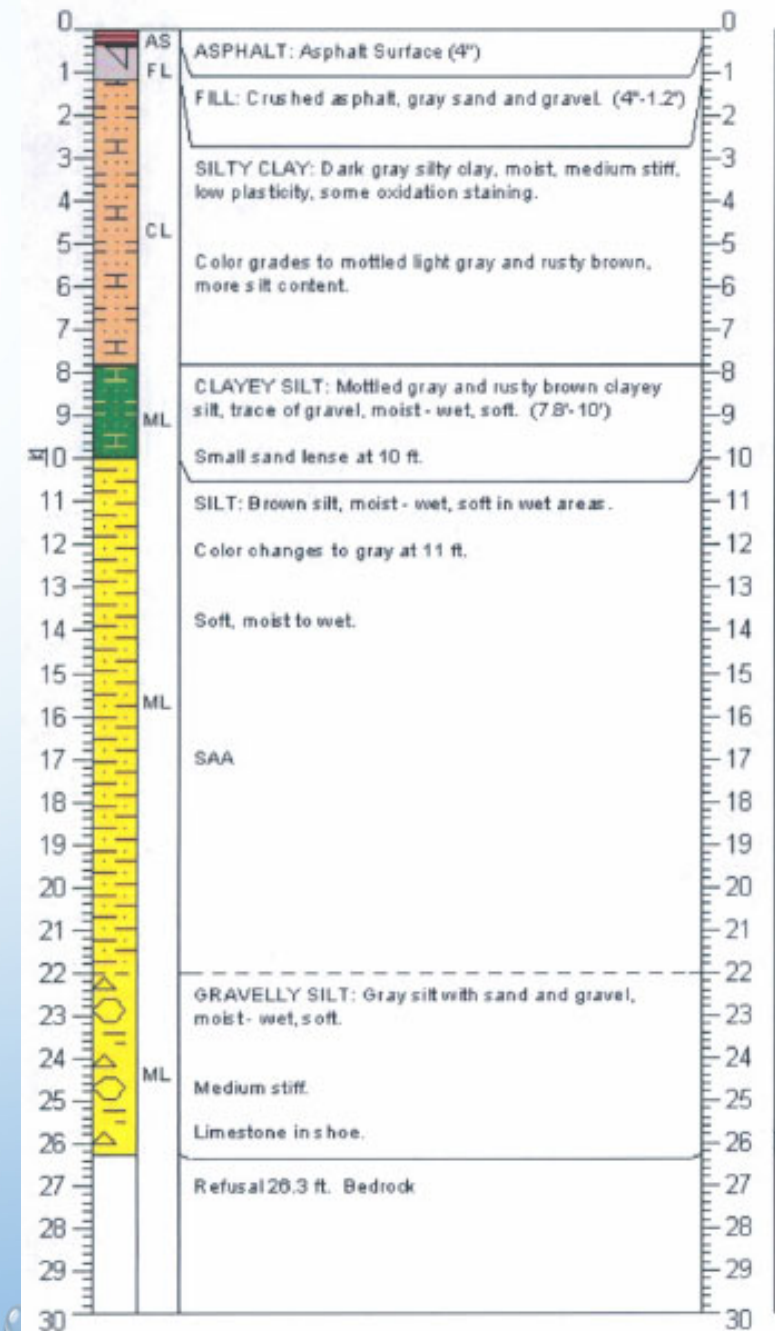
Residents of south suburb will get \$500K, plus free trash pickup, vehicle stickers and business licenses for 2 years



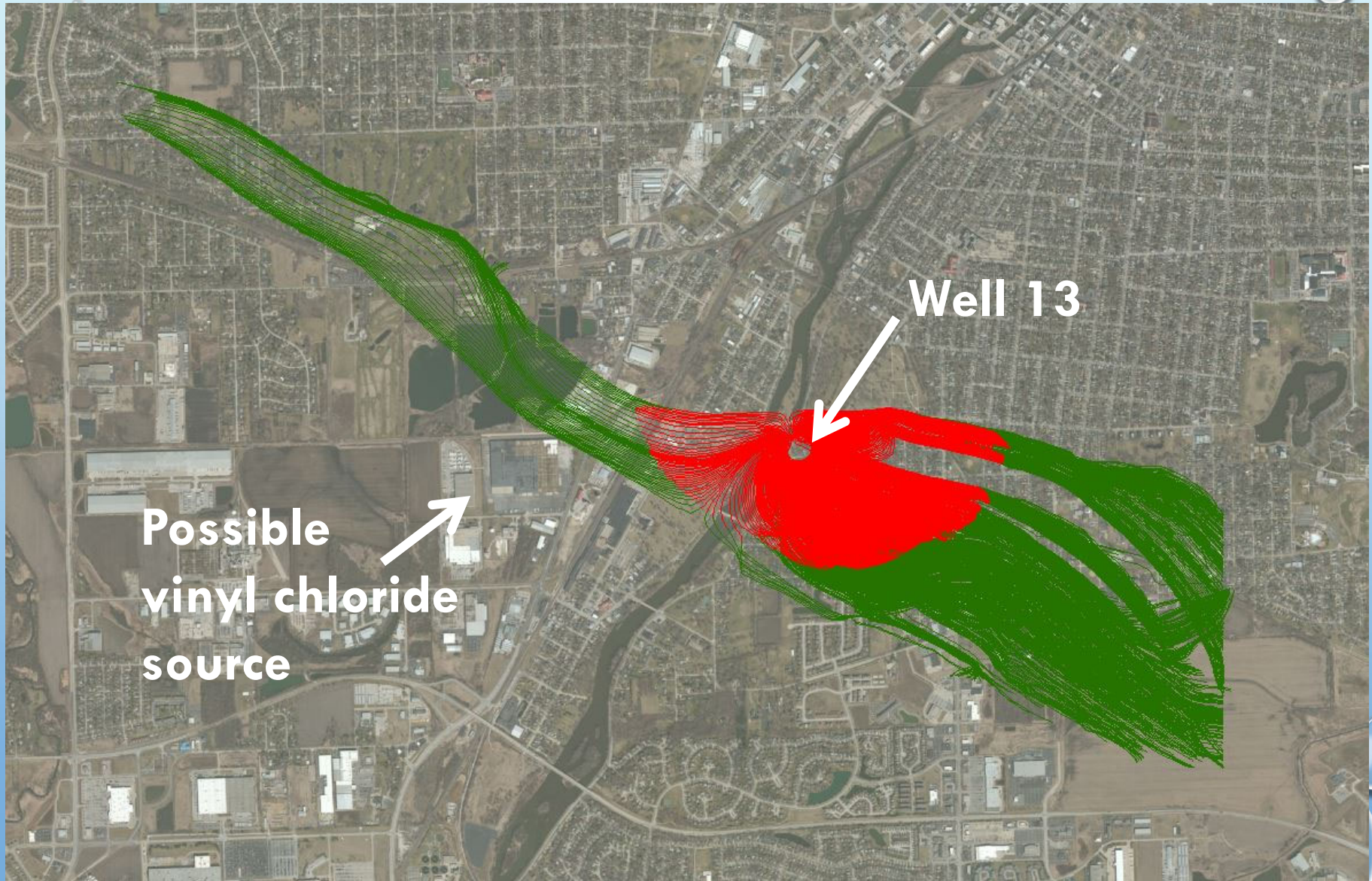
Crestwood Well Logs

Page 1 ILLINOIS SURVEY

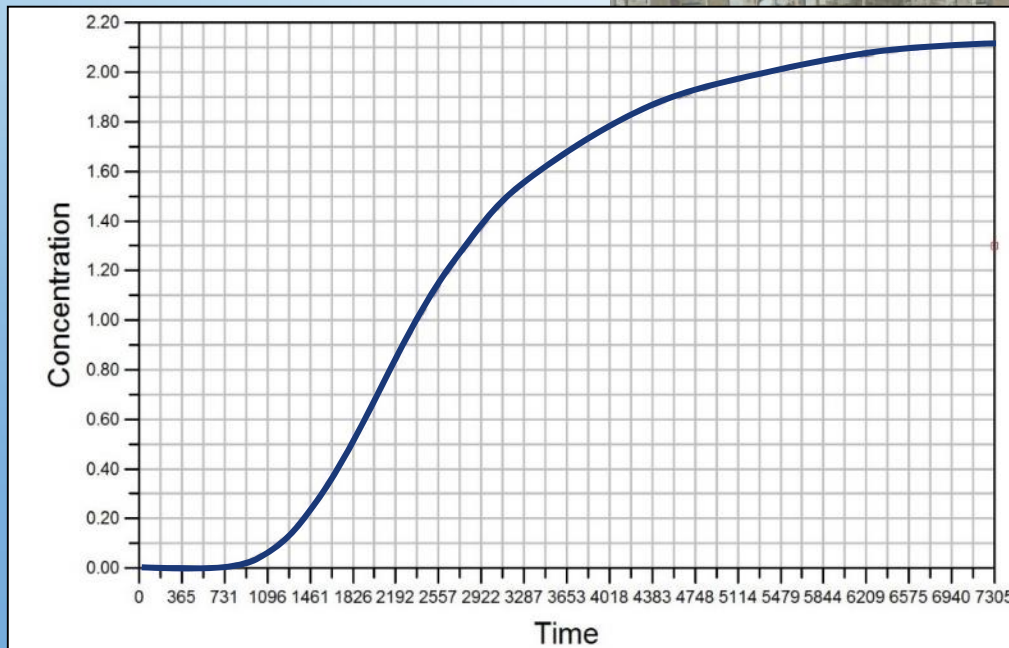
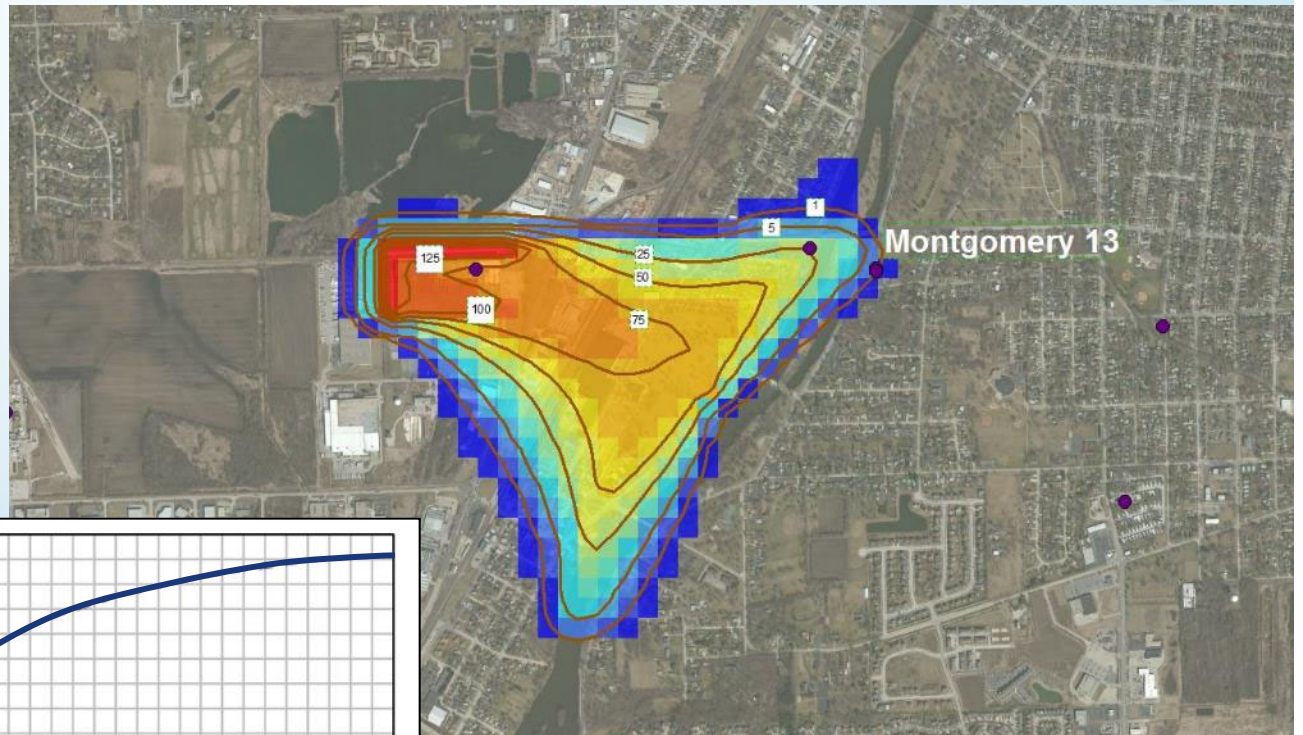
	Top	Bottom
loam, black	0	5
clay, yellow	5	10
clay & gravel	10	20
gravel	20	36
lime, gray, hard	36	260
lime, gray, medium	260	310
lime, gray, hard	310	325
lime, brown, hard	325	330
lime, gray, medium	330	340
lime & shale, streaks	340	345
Silurian	36	
Maquoketa	340	
Total Depth		345
Casing: 12" from 0' to :		



Montgomery



Telescoping Inset Models: Contaminant Transport



Montgomery Well #13 Log

black top soil	0	1
brown medium clay	1	6
medium to large boulders - sandy till	6	27
brown sandy clay mixed gravel & boulders	27	40
gray fine sand 1/4" to 1/2" gravel	40	55
gray fine sand	55	60
gray fine sand & medium gravel	60	70
sand to coarse gravel	70	82
lime with green shale seams	82	120
crevice @ 120' gry lime w/gray shale	120	150
gray shale	150	155
dk gry limestone w/grn shale seams	155	173
medium to soft gray shale	0	183
Total Depth		183

U.S. Scrap Site – SE Chicago

1648-foot well drilled in 1915

Page 1

ILLINOIS STATE GEOLOGICAL SURVEY

	Top	Bottom
surface material.s.cl.&pebbles	0	68
till, gravelly	68	75
siltstone,dol.laminae,gry-brn w/sporang	75	95
Silurian	95	
Maquoketa	460	
Galena	615	
St Peter	950	
Ironton	1495	
Total Depth		1648

US Scrap

VOC levels in the Silurian dolomite (ppb)

