

Midwest Technology Assistance Center
Groundwater Resource Assessment for Small Communities

**Groundwater Availability
At
Hutsonville, Illinois
(Crawford County)**

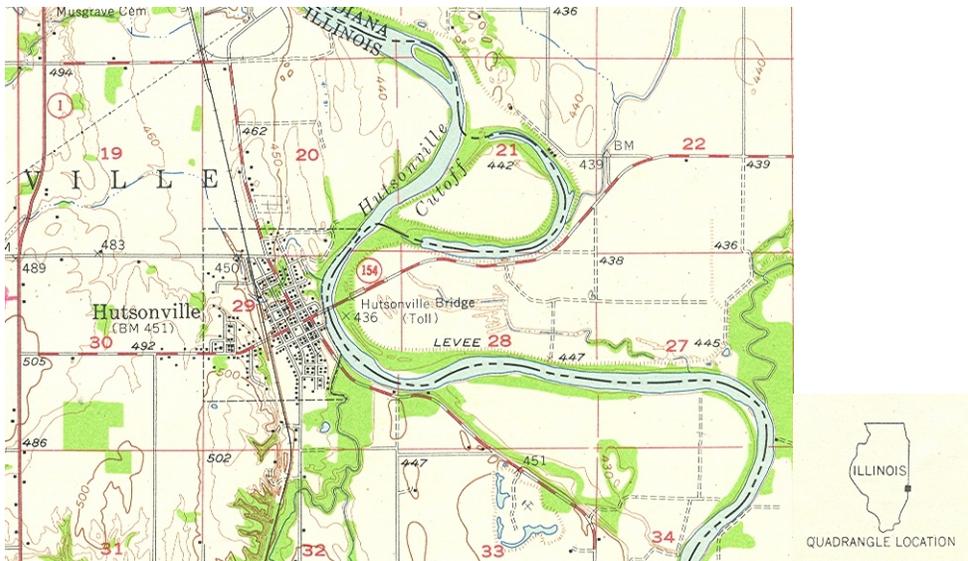
Project Overview

This project is an outgrowth of the Public Service Program of the Center for Groundwater Science (CGS) at the Illinois State Water Survey. For over 50 years, the CGS has provided groundwater information to any requesting individual, commercial facility or public water facility. Groundwater resource assessments have been an integral part of this public service and have been undertaken for thousands of individuals and facilities throughout its history. Community groundwater supplies that have been identified as potentially “deficient” are the targets for this project. The criterion used for determining community deficiency were; 1) Water Supply and Demand (operating time), 2) Aquifer Limitation, 3) Well Specific Capacity, and 4) Facility History. The Village of Hutsonville has been identified as a target community for groundwater assessment through this project.

Project Goal

To provide a resource tool of pertinent groundwater information to each target facility. This document describes a summary of historic information, current conditions and the potential for expansion of the water supply of Hutsonville.

Hutsonville (Crawford County)



The Village of Hutsonville (Facility Number 0330100) utilizes one active community water supply well. Well No. 3 (Illinois EPA No. 47811) produces approximately 63,000 gallons per day delivered to 285 service connections, and serves an estimated population of 700 individuals. Well No. 4 (IEPA No. 00164) is used only as an emergency backup well. Major consumers of Hutsonville's water supply are the nursing home and an electric motor factory.

Hutsonville was determined to be "Adequate" by the project criteria and this report serves as a summary of information should they need to increase their current supply. The shallow depth of Well No. 3 (both 32 feet) included this facility for study.

Historic Information

Background Well Information

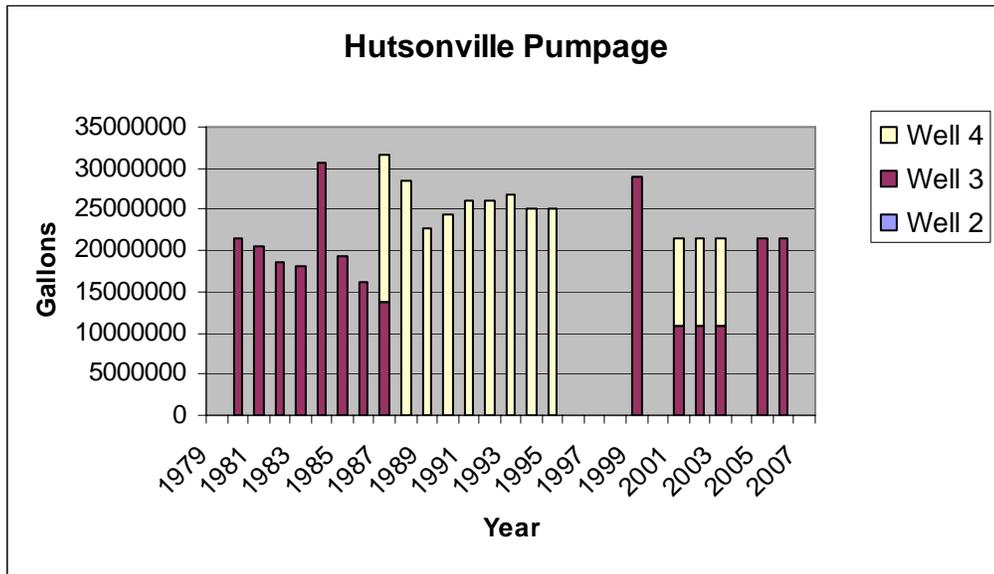
Well No. 3

Constructed in sand and gravel to a depth of 32 feet in 1958, this well is located within the floodplain of the Wabash River in Section 29, T.8N., R.11W., Crawford County. Upon construction, 9.5 feet of drawdown was observed while pumping 344 gallons per minute for 24 hours from a nonpumping water level of 12 feet below land surface. The calculated specific capacity of this well at the time of its construction was 36.2 gpm/ft. This well is currently pumped at about 260 gpm.

Well No. 4

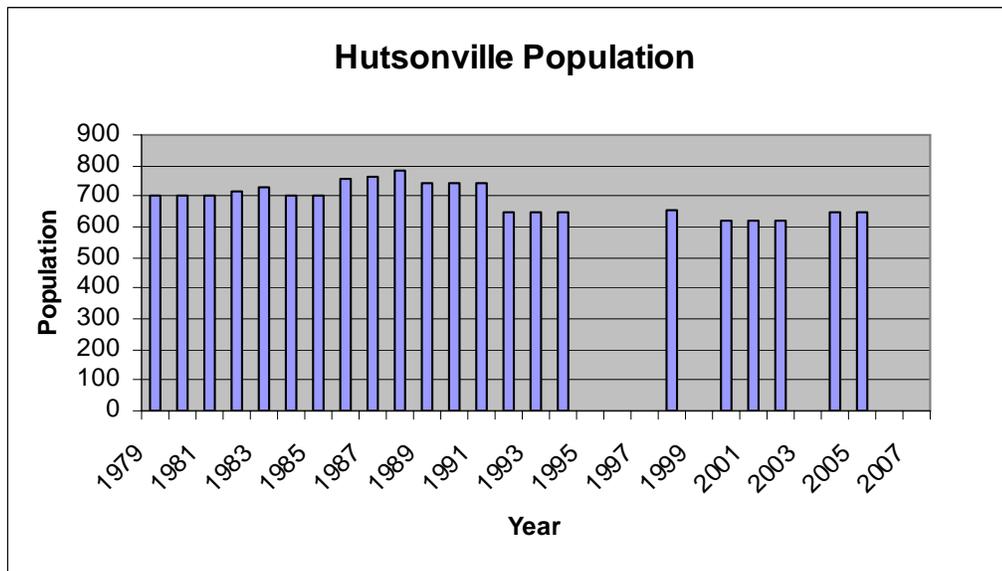
Constructed in sand and gravel to a depth of 73 feet in 1987, this well is located within the floodplain of the Wabash River in Section 20, T.8N., R.11W., Crawford County. Upon construction, 10.5 feet of drawdown was observed while pumping 400 gallons per minute for 5 hours from a nonpumping water level of 24.5 feet below land surface. The calculated specific capacity of this well at the time of its construction was 38.1 gpm/ft. This well is currently used only as an emergency well and is rated at about 340 gpm. The well was switched to an emergency well in 1999 due to reported high concentrations of nitrates in the water.

Background Pumpage Information



Source: ISWS Illinois Water Inventory Program

Historic Population Information



Source: ISWS Illinois Water Inventory Program

Regional Information

Resources within the Hutsonville area

Domestic Groundwater Supplies

The available regional data indicate that groundwater for domestic and farm use in this part of Illinois is obtained from mainly small-diameter drilled wells finished in the unconsolidated materials above bedrock. These wells tap sand and gravel at depths ranging from 40 to 90 feet in this area. Nonpumping water levels range from 6 to 10 feet with pumping water levels ranging from 1 to 21 feet below land surface. Upon completion, these wells reportedly produce groundwater at rates ranging from 25 to 750 gpm for short periods of time. Several irrigation wells are finished in this area that pump at very high rates.

Municipal Groundwater Supplies

The Hutsonville wells are located in sand and gravel deposits associated with the Wabash River. There are no close-by municipalities that have water supplies that produce groundwater at rates greater than their wells. There are many irrigation wells within this floodplain that produce groundwater at rates much greater than the Hutsonville wells. Typically these types of wells require rates of greater than 500 gpm and as much as 1,500 gpm.

Figures 1 and 2 picture the ISWS Potential Yield maps for sand and gravel and bedrock aquifers in Illinois, respectively. The pertinent counties for Hutsonville are highlighted. Figure 1 indicates that sand and gravel deposits are present and high-yielding within the local Hutsonville area. The potential increases northward along the river. The bedrock map (Figure 2) indicates poor potential for development from the bedrock throughout the area. Figures 3 and 4 present the probability of occurrence of the sand and gravel and the water-yielding character of the shallow bedrock for the Hutsonville area as depicted in the Illinois State Geologic Survey Circular 225, *Groundwater Geology in South-Central Illinois* (Selkregg, et al., 1957). Figure 3 indicates "Fair to Good," possibilities for the occurrence of water-bearing sand and gravel deposits locally. Figure 4 indicates low-yielding shales and sandstone units directly beneath the drift and only small supplies are generally available from the shallow bedrock units. The domestic well construction records verify these map outlooks.

Groundwater Availability Summary

The available information indicates that the sand and gravel deposits associated with the Wabash River within the Hutsonville area are capable of providing for the water needs of the village now and into the future. Should the town need to expand their system, an accessible location toward the river and away from the village would seem prudent in an effort to protect the source from potential contamination. It is highly recommended that a test drilling methodology be developed to quantify the groundwater quality for any new municipal well drilling,

given the high nitrates associated with Well No. 4 to the north of town. In any new development, care should be taken in properly spacing any new well away from the current wells to ensure drawdown interference is minimal.

References

Selkregg, L.F., W.A. Pryor, and J.P. Kempton. 1957. Groundwater Geology in South-Central Illinois. A Preliminary Geologic Report. Illinois State Geological Survey Circular 225.

Estimated Potential Yields of Sand and Gravel Aquifers in Hutsonville Area

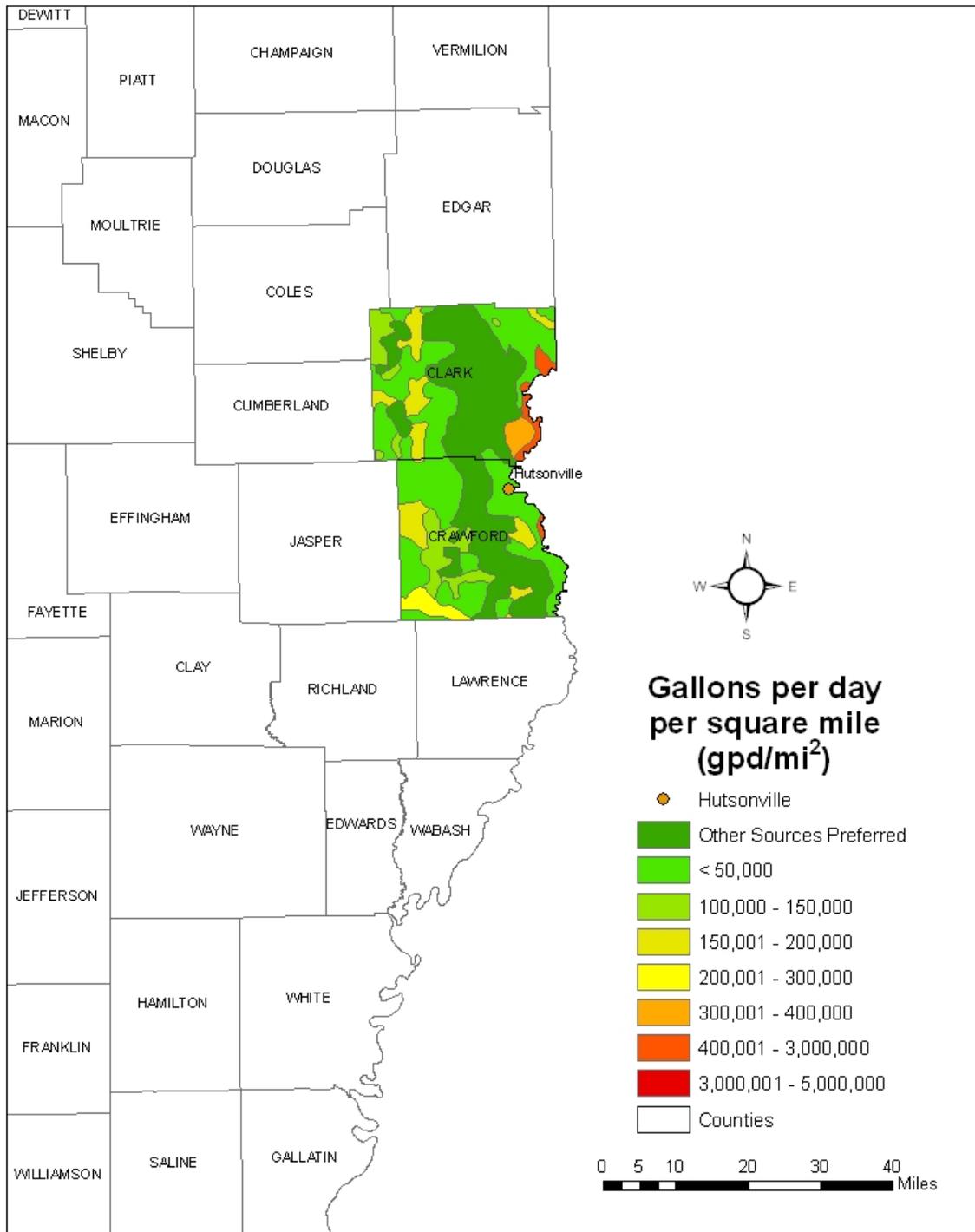


Figure 1.

Estimated Potential Yields of Shallow Bedrock Aquifers in Hutsonville Area

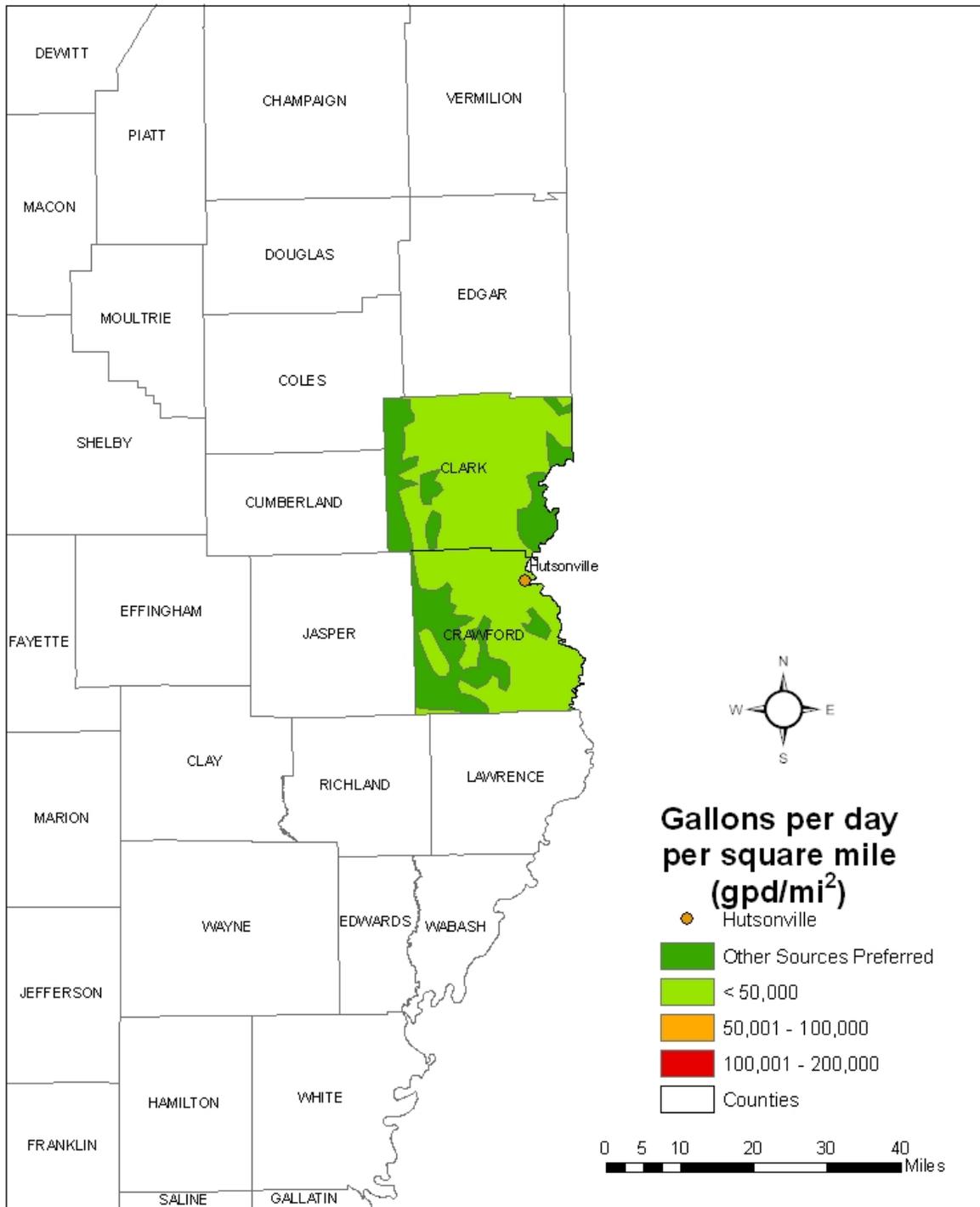


Figure 2.

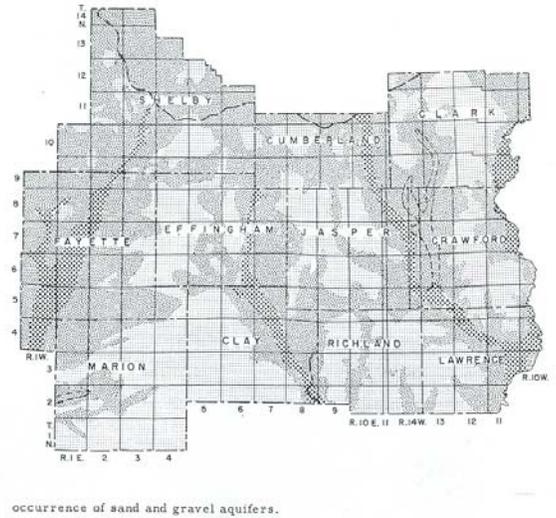
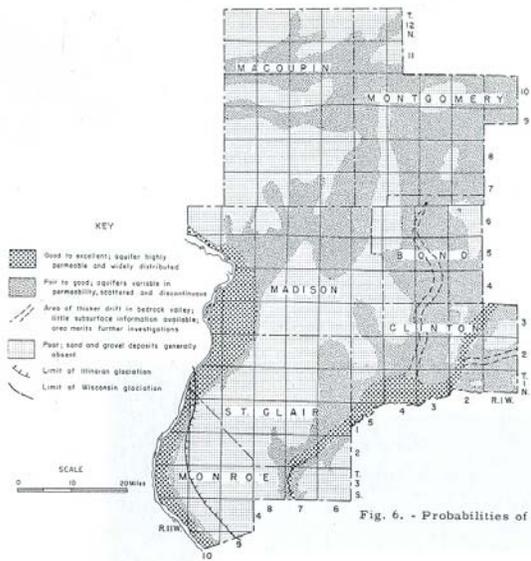


Figure 3.

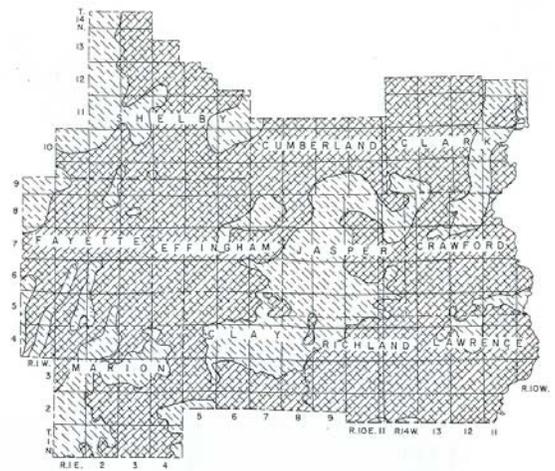
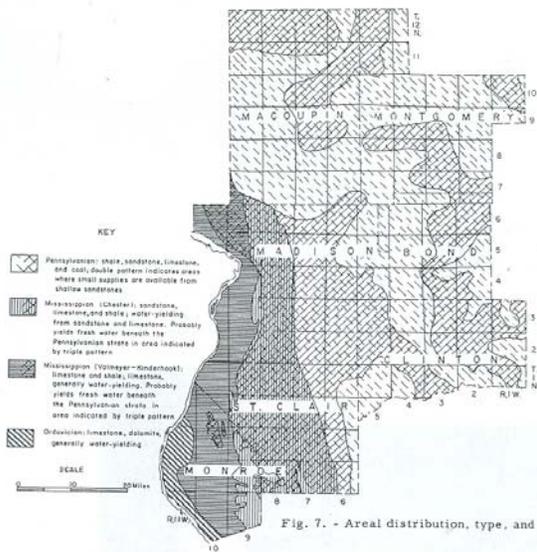


Figure 4.

ISWS publications list for the Hutsonville and surrounding areas.

* = Publication is out of print.

\$ = Payment required.

CLARK

- *1965 RI-53 Potential yield of aquifers in Embarras River Basin, Illinois. Walton-Csallany. Open File Report.
- 1965 RS-48 Relationship between water use and population in the Embarras River Basin, Illinois. Csallany.
- *1966 RI-55 Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.
- *1978 CR-199 Reconnaissance study of final cut impoundments. Gibb-Evans. 101p.
- *1980 CR-237 Assessment of eighteen public groundwater supplies in Illinois. Wehrmann-Visocky-Burris-Ringler-Brower. 185p.
- 1982 COOP-8 Hydrogeologic evaluation of sand and gravel aquifers for municipal groundwater supplies in East-Central Illinois. Kempton-Morse-Visocky. 59p.
- 1989 ISSJR-2 Evaluation of underground injection of industrial waste in Illinois. Brower-Visocky-Krapac-Hensel-Peyton-Nealon-Guthrie. 182p.

CRAWFORD

- *1965 RI-53 Potential yield of aquifers in Embarras River Basin, Illinois. Walton-Csallany. Open File Report.
- *1965 RS-47 Type-curve solution to aquifer tests under water-table conditions. Prickett.
- 1965 RS-48 Relationship between water use and population in the Embarras River Basin, Illinois. Csallany.
- *1966 RI-55 Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.
- *1978 CR-209 Assessment of public groundwater supplies in Illinois. Visocky-Wehrmann-Kim-Ringler. 193p.