

Midwest Technology Assistance Center
Groundwater Resource Assessment for Small Communities

**Groundwater Availability
At
St. Francisville, Illinois
(Lawrence County)**

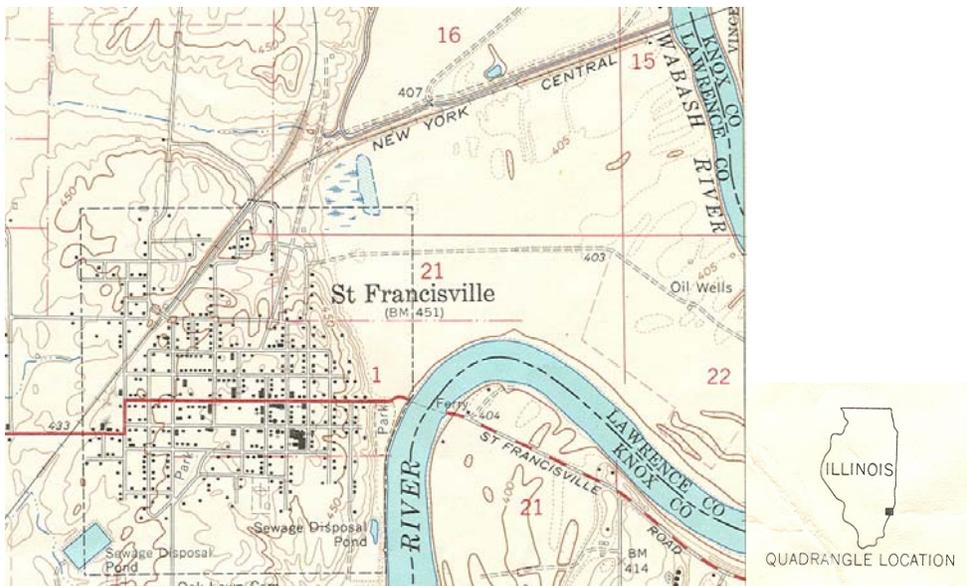
Project Overview

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 St. Francisville 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 St. Francisville.

St. Francisville (Lawrence County)



The St. Francisville Public Water Supply (Facility Number 1010250) utilizes three active community water supply wells. Well Nos. 6, 7 and 8 (Illinois EPA Nos. 70861, 70862 and 01322, respectively) combine to produce over 70,000 gallons per day delivered to 365 service connections and serve an estimated village population of 851 and a combined population served by South Lawrence and the R.E. Water Company of approximately 3,360 individuals.

St. Francisville 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 Nos. 6 and 7 (both 42 feet) included this facility within the study.

Historic Information

Background Well Information

Well No. 6

Constructed in sand and gravel to a depth of 42 feet in 1975, this well is located in Section 29, T.2N., R.11W., Lawrence County. Upon construction, 7 feet of drawdown was observed while pumping 1,000 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 142.8 gpm/ft. The long-term production rate was estimated to be around 425 gpm. This well is currently pumped at about 200 gpm.

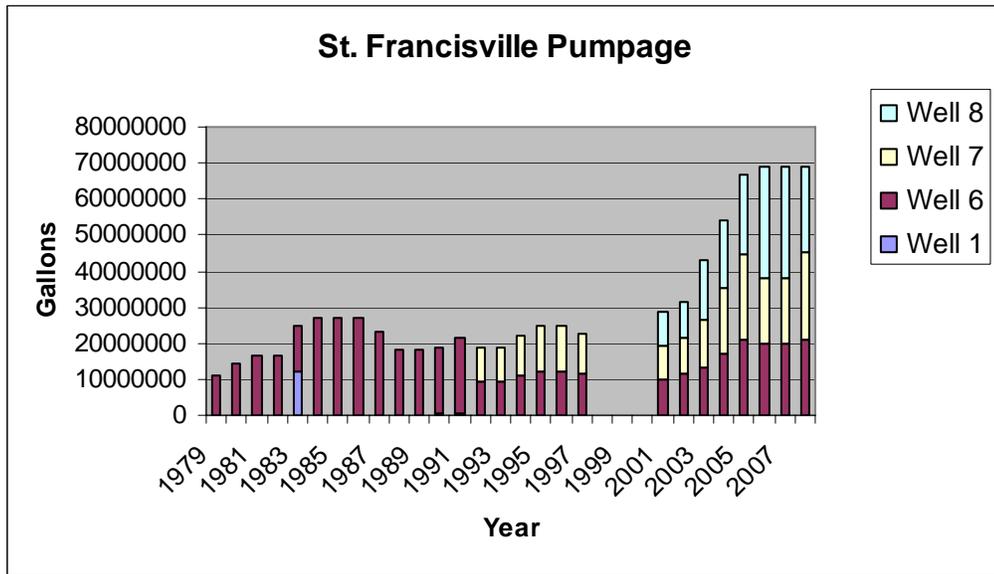
Well No. 7

Constructed in sand and gravel to a depth of 42 feet in 1991, this well is located in Section 29, T.2N., R.11W., Lawrence County. Upon construction, 24.1 feet of drawdown was observed while pumping 690 gallons per minute for 22.5 hours from a nonpumping water level of 12.8 feet below land surface. The calculated specific capacity of this well at the time of its construction was 28.6 gpm/ft. This well is currently pumped at about 280 gpm.

Well No. 8

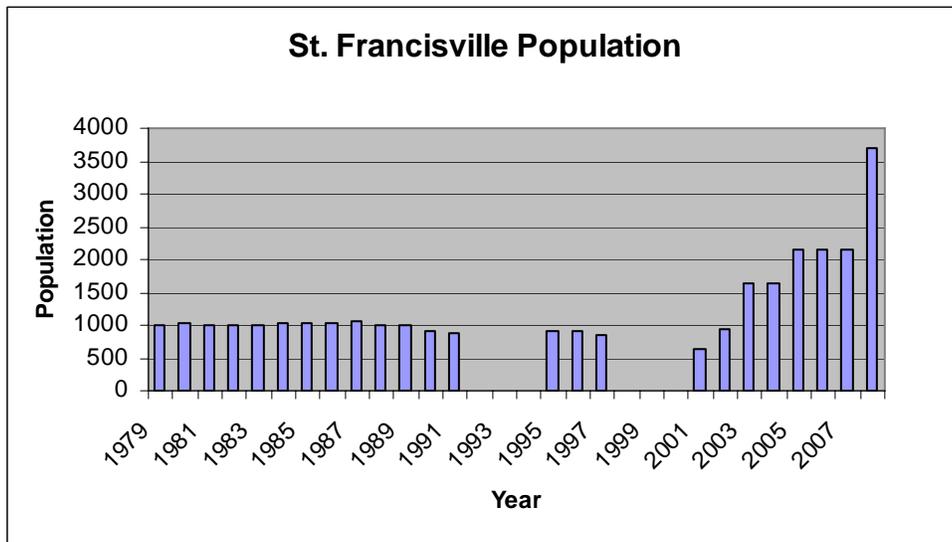
Constructed to a depth of 60 feet, this well is located in Section 32, T.2N., R.11W., Lawrence County. No other information concerning this well is available other than that it is currently pumped at about 250 gpm.

Background Pumpage Information



Source: ISWS Illinois Water Inventory Program

Historic Population Information



Source: ISWS Illinois Water Inventory Program

Regional Information

Resources within the St. Francisville 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 31 to 127 feet in this area. Nonpumping water levels range from 6 to 10 feet with pumping water levels ranging from 11 to 80 feet below land surface. Upon completion, these wells reportedly produce groundwater at rates ranging from 20 to 120 gpm for short periods of time.

Municipal Groundwater Supplies

The St. Francisville wells are located in sand and gravel deposits associated with the Wabash River. Only one nearby town has wells comparable to their supply, the City of Lawrenceville. Lawrenceville also uses wells (five) finished within the sand and gravel deposits associated with the Wabash River, located in Sections 2 and 11, T.3N., R.11W., Lawrence County. These wells range in depth from 71 to 103 feet deep and produce groundwater at rates ranging from 500 to 1,500 gpm for their supply.

Figures 1 and 2 picture the ISWS Potential Yield maps for sand and gravel and bedrock aquifers in Illinois, respectively. The pertinent counties for St. Francisville are highlighted. Figure 1 indicates that sand and gravel deposits are present and high-yielding within the local St. Francisville 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 St. Francisville 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 St. Francisville 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. 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 St Francisville Area

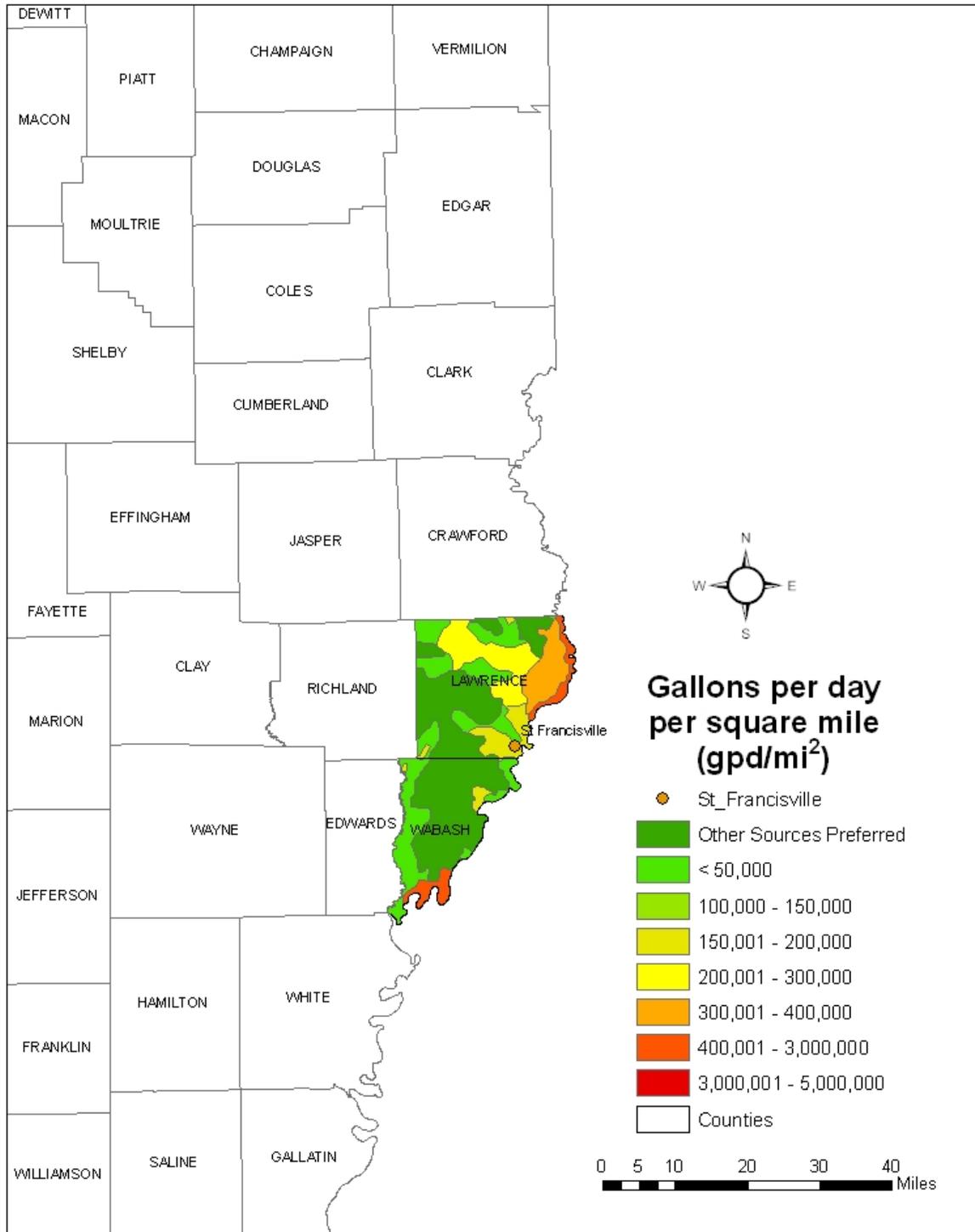


Figure 1.

Estimated Potential Yields of Shallow Bedrock Aquifers in St. Francisville Area

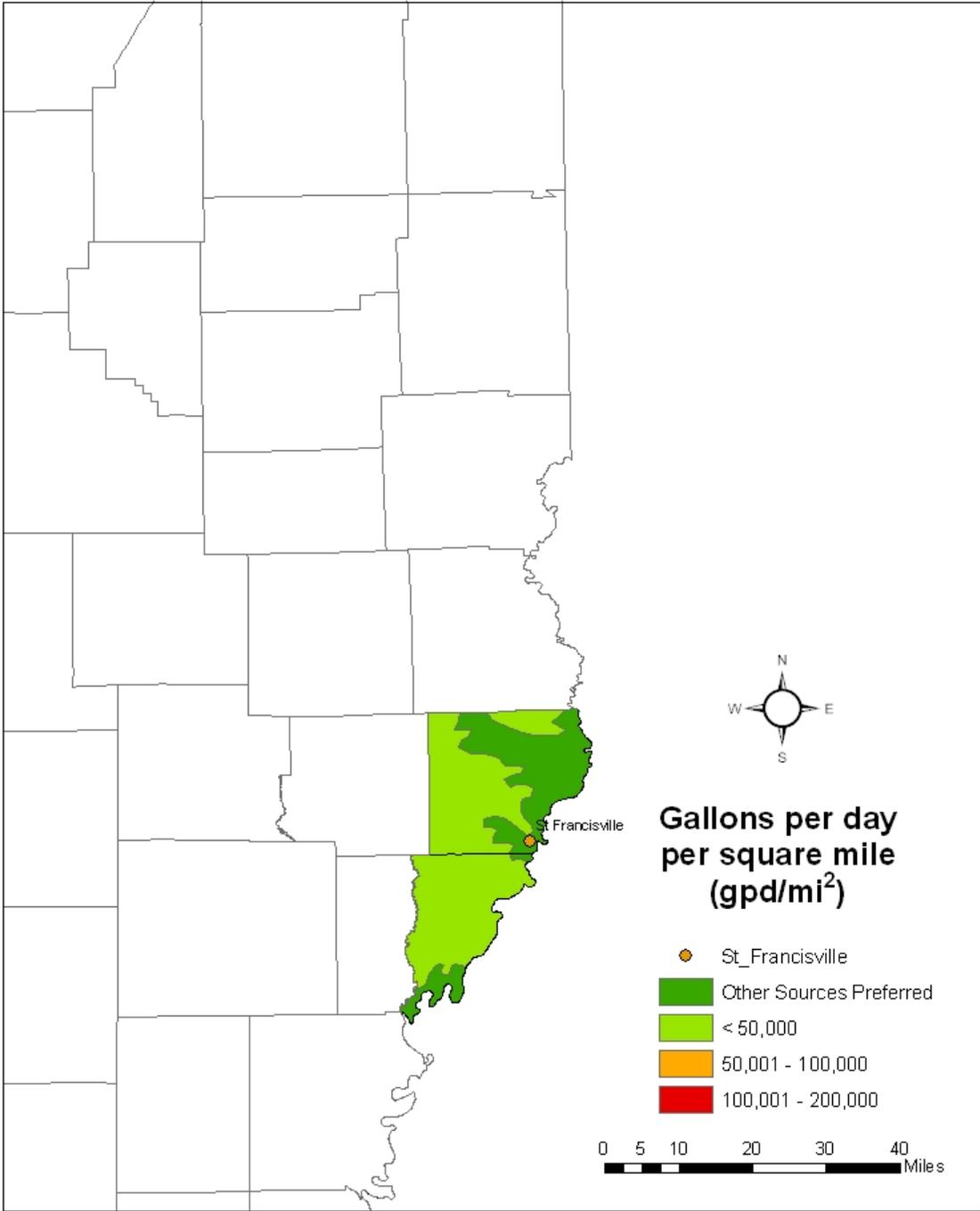


Figure 2.

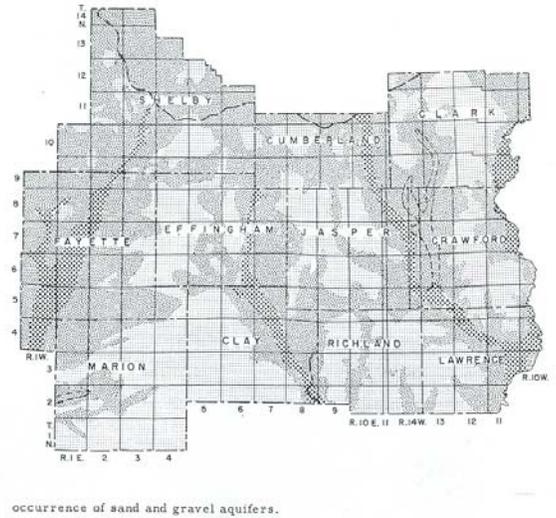
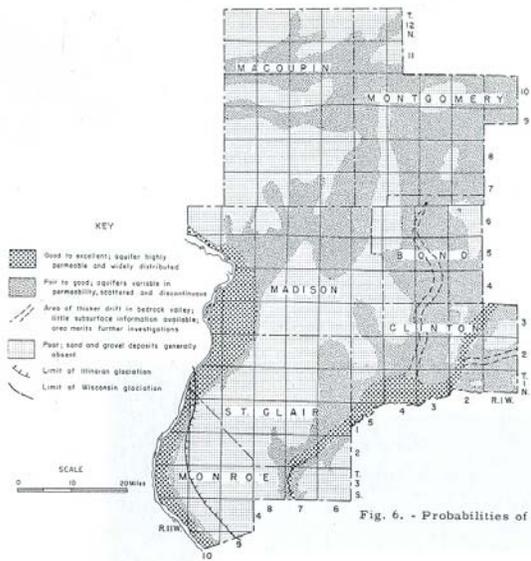


Figure 3.

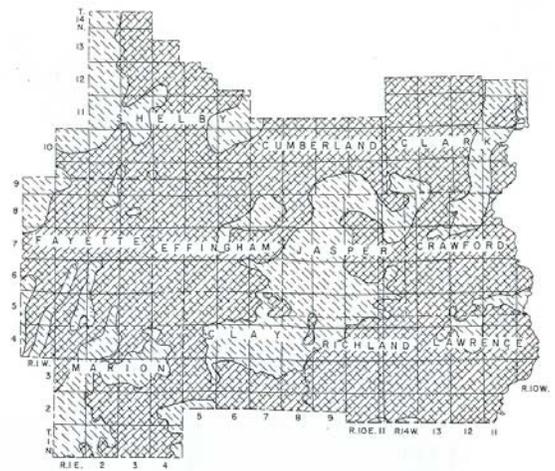
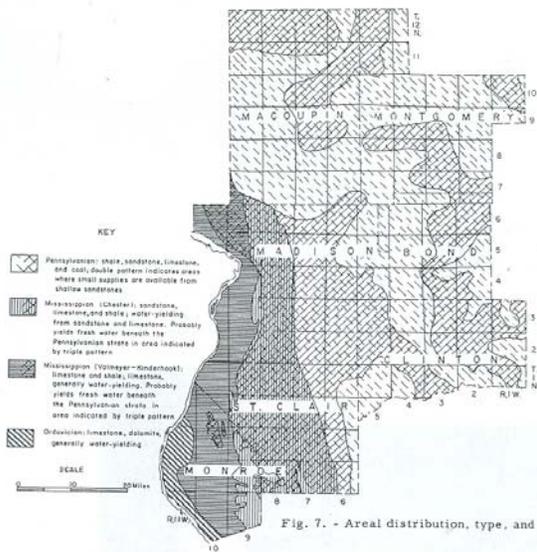


Figure 4.

ISWS publications list for the St. Francisville and surrounding areas.

* = Publication is out of print.

\$ = Payment required.

LAWRENCE

- *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.

WABASH

- *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.
- *1985 B-60-31 Public groundwater supplies in Wabash County. Woller-Olson. 12p.
- 1994 CR-578 Ground-Water Investigation at Mount Carmel, Illinois. Visocky-Sanderson. 186p.