

Midwest Technology Assistance Center  
Groundwater Resource Assessment for Small Communities

**Groundwater Availability  
At  
Raymond, Illinois  
(Montgomery County)**

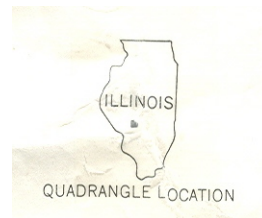
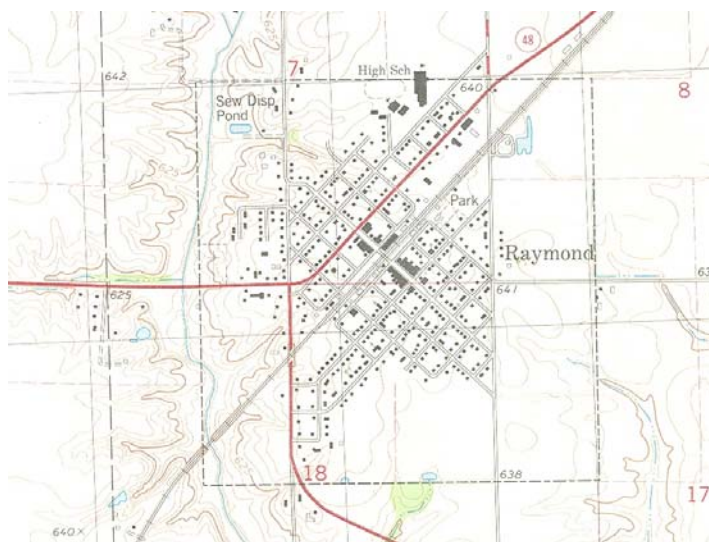
**Project Overview**

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.

**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 within 5 and 10 miles of Raymond.

**Raymond  
(Montgomery County)**



The Village of Raymond (Facility No. 1350550) obtains its water from five active community water supply wells. Well Nos. 1, 2, 3, 4, and 5 (Illinois EPA Nos. 50131, 50132, 50133, 50134, and 01234, respectively) supply an average of 99,100 gallons per day (gpd) to 470 services or a population of 903.

Raymond was determined to be “Adequate” mainly because of the well field capacity for the required supply. This report summarized groundwater resources within this area should the village look to increase usage.

**Historic Information**

Background Well Information

Raymond mainly uses Well No. 5 for its supply and has Well No. 4 as an emergency backup well. The village also has Well Nos. 2 and 3, both finished in sand and gravel at 39 and 36 feet, respectively, as additional backup for their supply, however, these two wells are rarely used.

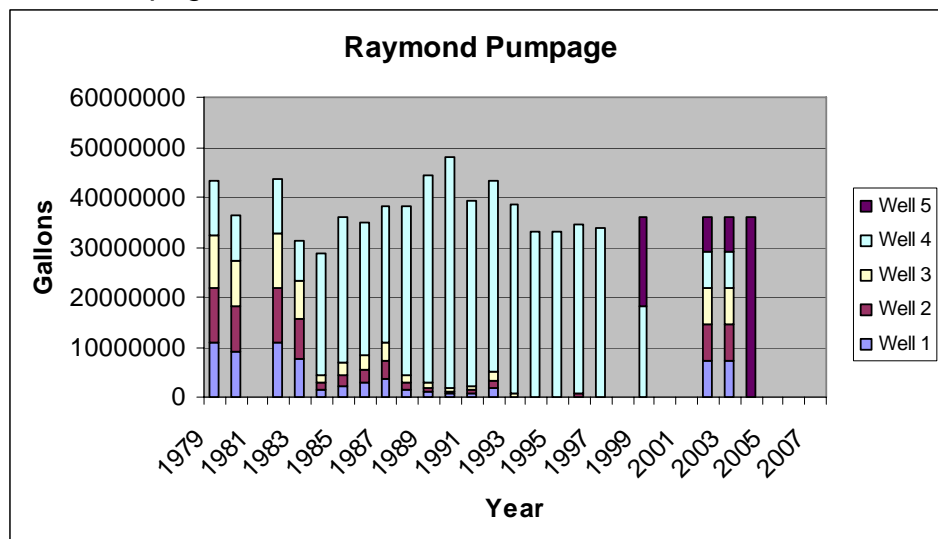
Well No.4

Finished in sand and gravel deposits located in Section 8, T.10N., R.4W., Montgomery County. The well was drilled to a depth of 52 feet in 1977 and is rated at 140 gallons per minute (gpm). Static water level was reported to be about 11 feet below land surface, upon its completion.

Well No.5

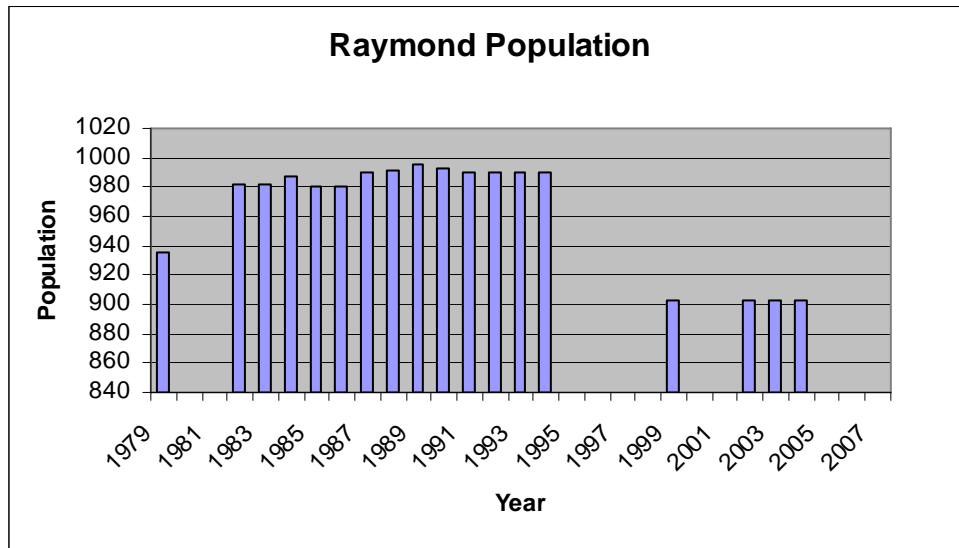
Finished in sand and gravel deposits located in Section 8, T.10N., R.4W., Montgomery County. The well was drilled to a depth of 54 feet in 1998 with a static water level reported at 11.25 feet below land surface, upon its completion. It was tested at 250 gpm but is rated at 140 (gpm) for its operational use.

Background Pumpage Information



Source: ISWS Illinois Water Inventory Program

## Historic Population Information



Source: ISWS Illinois Water Inventory Program

## **Regional Information**

### Resources within 5 miles of Harvel.

#### *Domestic Groundwater Supplies*

The available regional data indicate that groundwater for domestic and farm use in this part of Illinois is obtained mainly from small-diameter drilled and large-diameter (approximately 3 feet) bored wells finished in the unconsolidated materials above bedrock. The drilled wells are finished in narrow discontinuous sand and gravel deposits found throughout the area. The bored wells tap stringers or lenses of silt, sand, or gravel only a few inches thick contained in the unconsolidated materials above bedrock. The yield of this type of well is limited to a few hundred gallons per day and may be only barely adequate for normal household uses.

A few reported wells in the area have been drilled into the underlying Pennsylvanian bedrock formations. These wells are finished in thin sandstone found within the shallow bedrock. Upon completion, these wells were pumped at very low rates for short periods of time.

#### *Municipal Groundwater Supplies*

There is only one town within five miles of Raymond; the Village of Harvel to the northeast in Montgomery County. Harvel uses two wells to obtain its supply. Both wells are located in Section 34, T.11N., R.4W., Montgomery County. The

wells are finished in sand and gravel at depths of 38 and 35 feet. Each well is pumped at about 150 gpm for their supply.

#### Resources with 10 miles of Raymond.

##### *Municipal Groundwater Supplies*

Because the Village of Raymond's wells are finished in what is termed the "Central Illinois Strip Aquifer," only the Village of Morrisonville wells are detailed below. Morrisonville has wells that are also finished in this aquifer and would be the only other wells of interest for future development for Raymond. All the other towns located within 10 miles of Raymond use sand and gravel deposits that are very local and very limited in their surrounding areas.

The Village of Morrisonville uses three sand and gravel wells (Nos. 4, 5, 6) located in Sections 8 and 9, T.11N., R.3W., Christian County. They range in depth from 39 to 45 feet and are each rated at about 150 gpm.

Figures 1 and 2 picture the ISWS Potential Yield maps for sand and gravel and bedrock aquifer in Illinois, respectively. The pertinent counties for Raymond are highlighted. Figure 1 indicates that sand and gravel deposits are variable throughout most of the Raymond area with the exception of the "Central Illinois Strip Aquifer" that runs from the northeast to the southwest across this area. This aquifer is a good source of groundwater for domestic and municipal wells in this area and is detailed in Cooperative Groundwater Report 6, *Assessment of a Regional Aquifer in Central Illinois* (Burris, et. al. 1981).

The bedrock map (Figure 2) indicates poor availability of groundwater from the bedrock throughout the Raymond 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 Raymond 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," variable and discontinuous sand and gravel deposits and Figure 4 indicates only small supplies are 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 the Village of Raymond currently uses are capable of providing groundwater to meet the village needs now and into the future. Raymond, along with Harvel, Palmer, and Morrisonville, all collect groundwater from a reliable strip aquifer located in this area. The aquifer runs from the northeast starting near the village of Macon, to the southwest near Raymond. Although this system is not very deep, it is highly

productive and produces good quality groundwater. Figure 5 depicts this aquifer in this area along with municipalities that currently use it. Should they need to expand, the areas where their current wells reside would be the most logical site for further study. The distance between wells would be the critical factor so interference drawdown would be held to a minimum. Replacing wells nearby any that fail would be recommended if no additional water is required. Cooperative Report 6 (Burriss, et.al. 1981) describes this aquifer in detail and should be used as a guide in any further development in this area.

## Estimated Potential Yields of Sand and Gravel Aquifers in Raymond

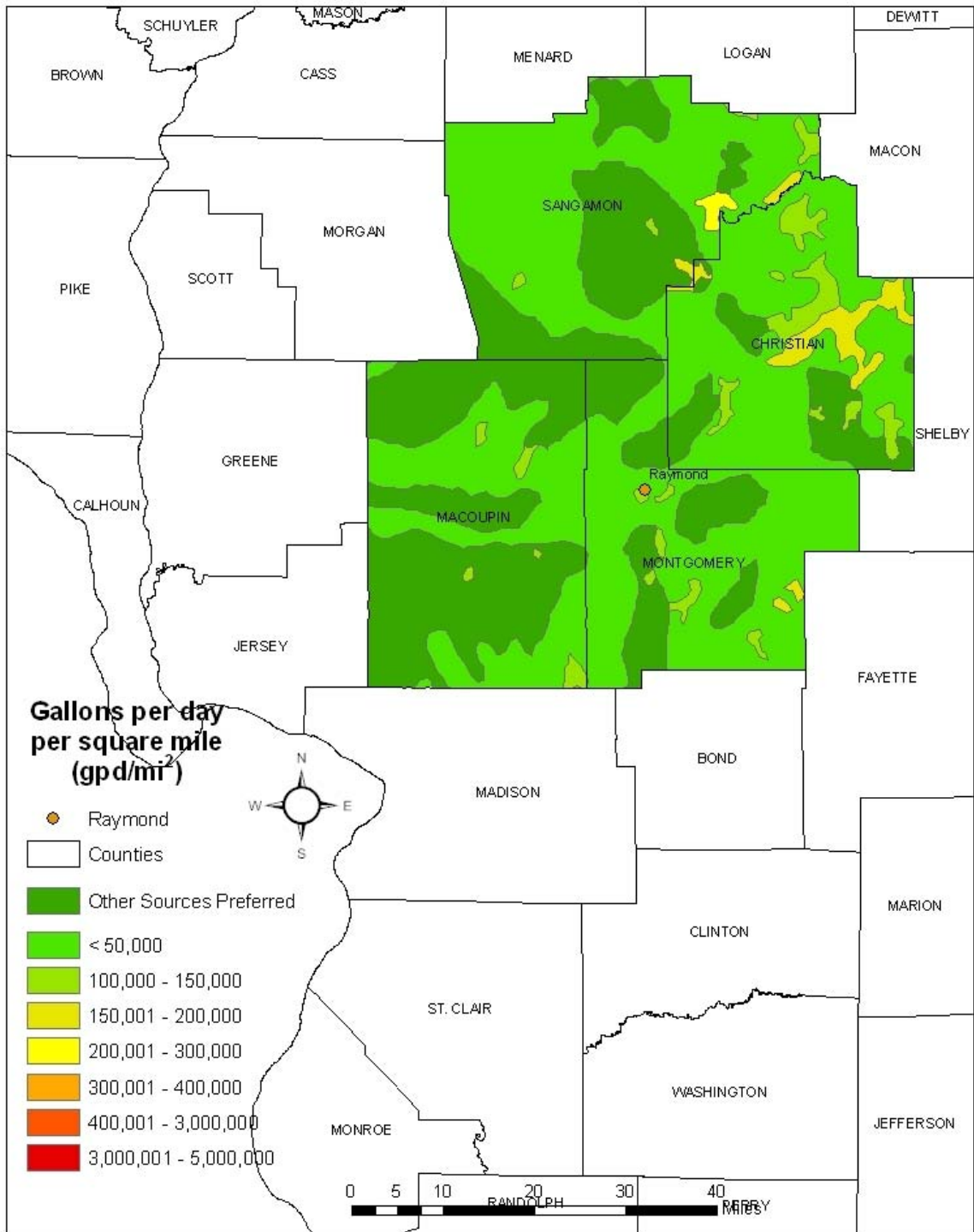


Figure 1.

# Estimated Potential Yields of Shallow Bedrock Aquifers in Raymond Area

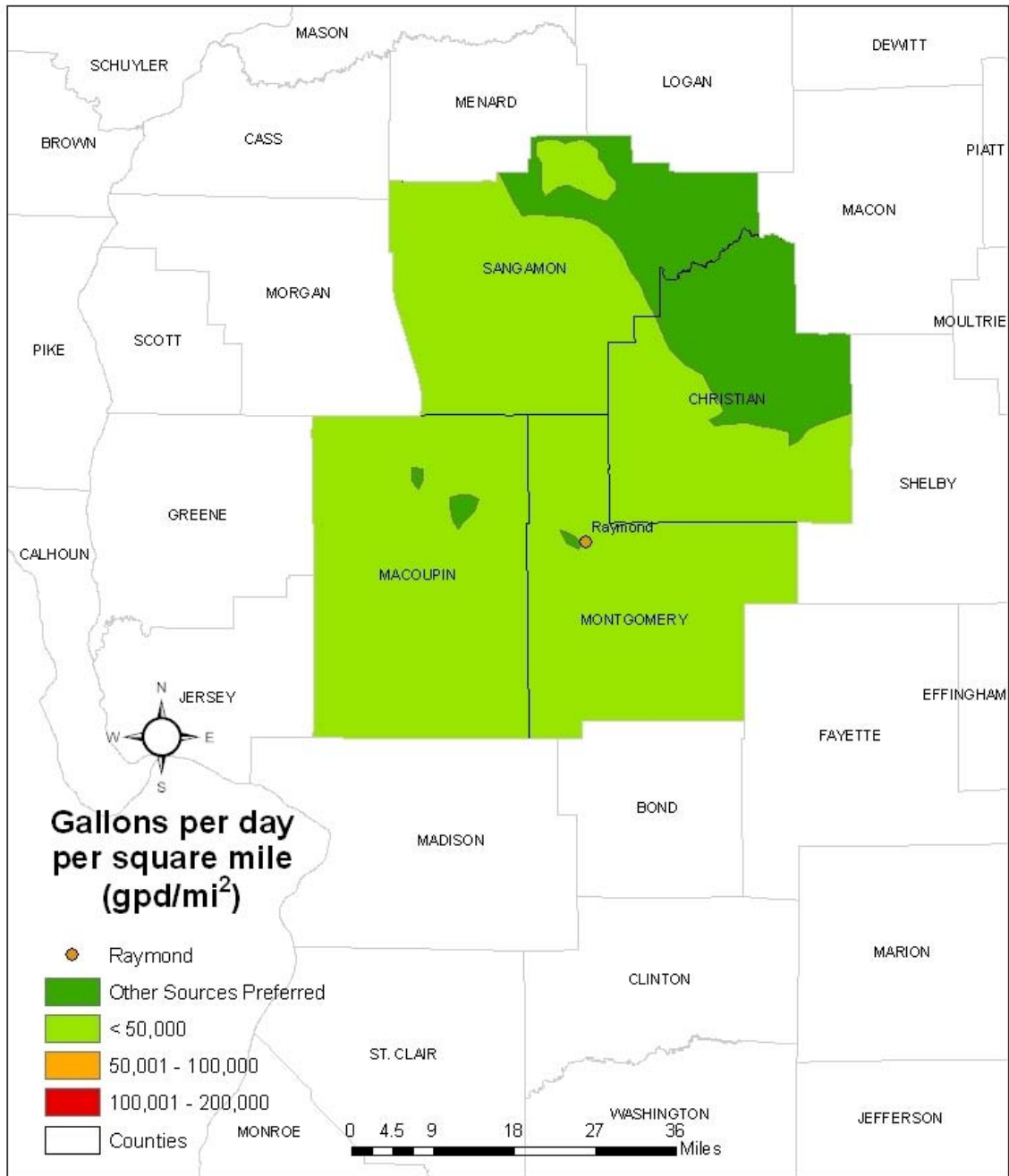


Figure 2.

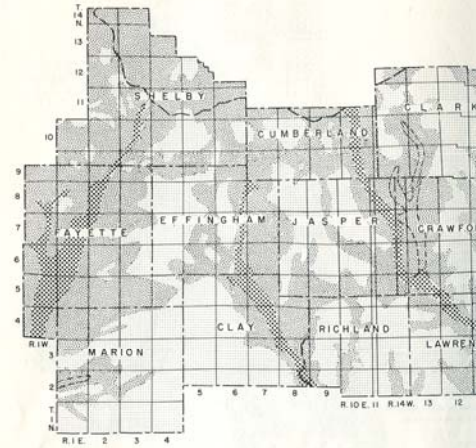
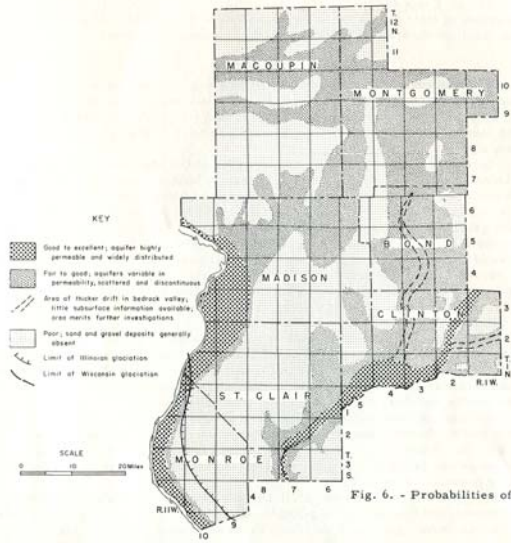


Figure 3.

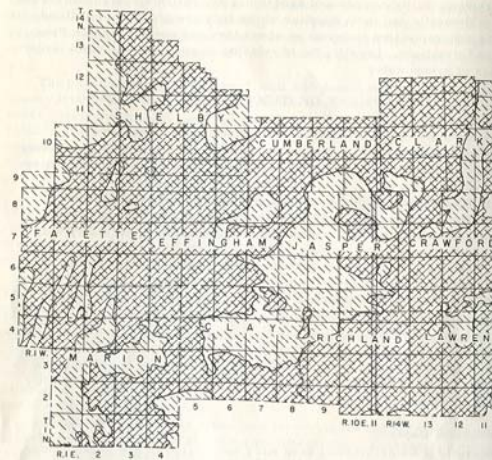
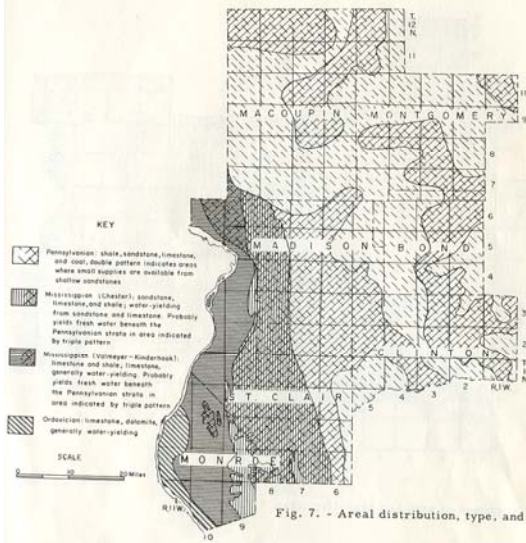


Figure 4.



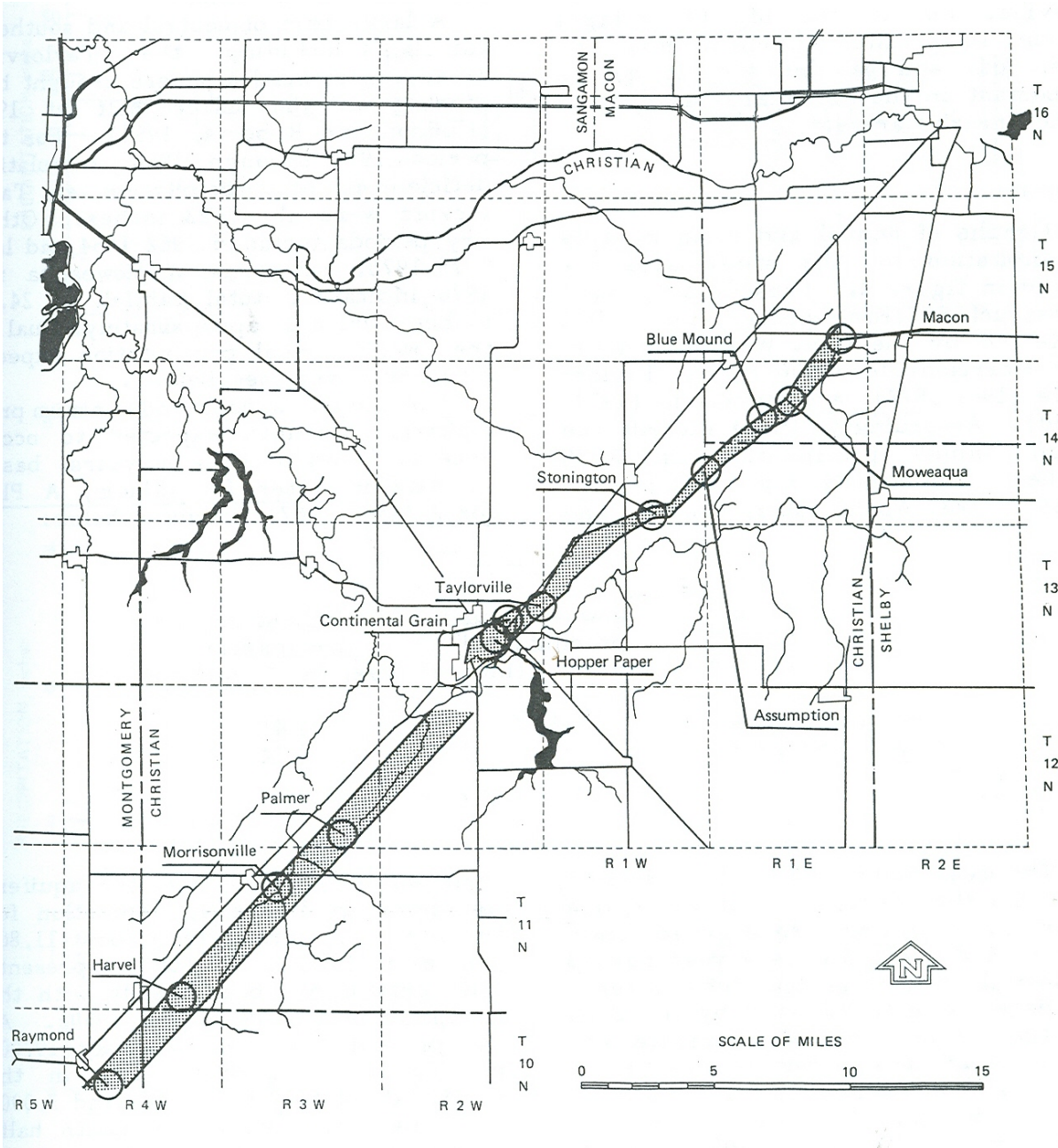


Figure 5. Municipality and well field locations for the Central Illinois Strip Aquifer. (Burriss, et.al. 1981)

## References

- Burris, C.B., W.J. Morse, and T.G. Naymik. 1981. Assessment of a Regional Aquifer in Central Illinois. Illinois State Water Survey, Illinois State Geological Survey Cooperative Report 6.
- Selkregg, L.F., W. Pryor, and J. Kempton. 1957. Groundwater Geology in South-Central Illinois, A preliminary Geologic Report. Illinois State Geological Survey Circular 225.

### ISWS publications list for Raymond and surrounding areas.

\* = Publication is out of print.

\$ = Payment required.

## CHRISTIAN

- \*1961 RI-41 Ground-water development in three areas of central Illinois. Walker-Walton. 43p.
- \*1961 RS-17 Evaluating wells and aquifers by analytical methods. Walton-Walker.
- \*1969 RI-62 Groundwater resources of the buried Mahomet Bedrock Valley. Visocky-Schicht. 52p.
- \*1978 CR-209 Assessment of public groundwater supplies in Illinois. Visocky-Wehrmann-Kim-Ringler. 193p.
- 1981 COOP-6 Assessment of a regional aquifer in central Illinois. Burris-Morse-Naymik. 77p.
- \*1981 COOP-7 Procedures for the collection of representative water quality data from monitoring wells. Gibb-Schuller-Griffin. 66p.
- \*1982 CR-299 A summary of information related to the comprehensive management of groundwater and surface water resources in the Sangamon River Basin, Illinois. O'Hearn-Williams. 145p.

## **MACOUPIN**

- \*1966 RI-55 Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.
- 1976 B-60-17 Public groundwater supplies in Macoupin County. Woller. 9p.
- \*1982 CR-299 A summary of information related to the comprehensive management of groundwater and surface water resources in the Sangamon River Basin, Illinois. O'Hearn-Williams. 145p.

## **MONTGOMERY**

- \*1966 RI-55 Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.
- 1972 RI-70 Plans for meeting water requirements in the Kaskaskia River Basin, 1970-2020. Singh-Visocky-Lonnquist. 24p.
- \*1978 CR-209 Assessment of public groundwater supplies in Illinois. Visocky-Wehrmann-Kim- Ringler. 193p.
- 1981 COOP-6 Assessment of a regional aquifer in central Illinois. Burris-Morse-Naymik. 77p.
- \*1982 CR-299 A summary of information related to the comprehensive management of groundwater and surface water resources in the Sangamon River Basin, Illinois. O'Hearn-Williams. 145p.

## **SANGAMON**

- \*1969 RI-62 Groundwater resources of the buried Mahomet Bedrock Valley. Visocky-Schicht. 52p.
- \*1980 CR-237 Assessment of eighteen public groundwater supplies in Illinois. Wehrmann-Visocky-Burris-Ringler-Brower. 185p.
- \*1982 CR-299 A summary of information related to the comprehensive management of groundwater and surface water resources in the Sangamon River Basin, Illinois. O'Hearn-Williams. 145p.
- 1998 CR-627 Potential ground-water resources for Springfield, Illinois. Anliker-Woller. 197p.