

Midwest Technology Assistance Center
Groundwater Resource Assessment for Small Communities

**Groundwater Availability
At
Harvel, 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 Harvel.

Harvel (Montgomery County)



The Village of Harvel (Facility Number 0490350) utilizes two active community water supply wells. Well Nos. 1 and 2 (Illinois EPA Nos. 45174 and 45175, respectively) combine to produce approximately 19,300 gallons per day delivered to 135 service connections and serve an estimated population of 257.

Harvel 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

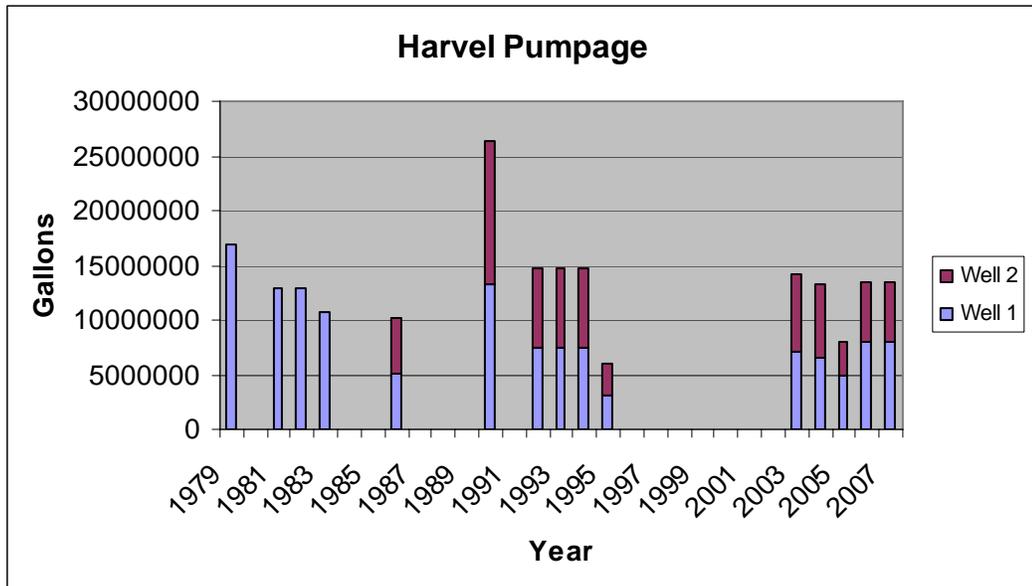
Well No.1

Finished in shallow sand and gravel deposits located in Section 34, T.11N., R.4W., Montgomery County. The well was drilled to a depth of 38 feet in 1954 and was tested at 100 gallons per minute (gpm) with 2.6 feet of drawdown from a static water level of 10.7 feet. The well is currently rated at about 200 gpm but is pumped around 150 gpm.

Well No.2

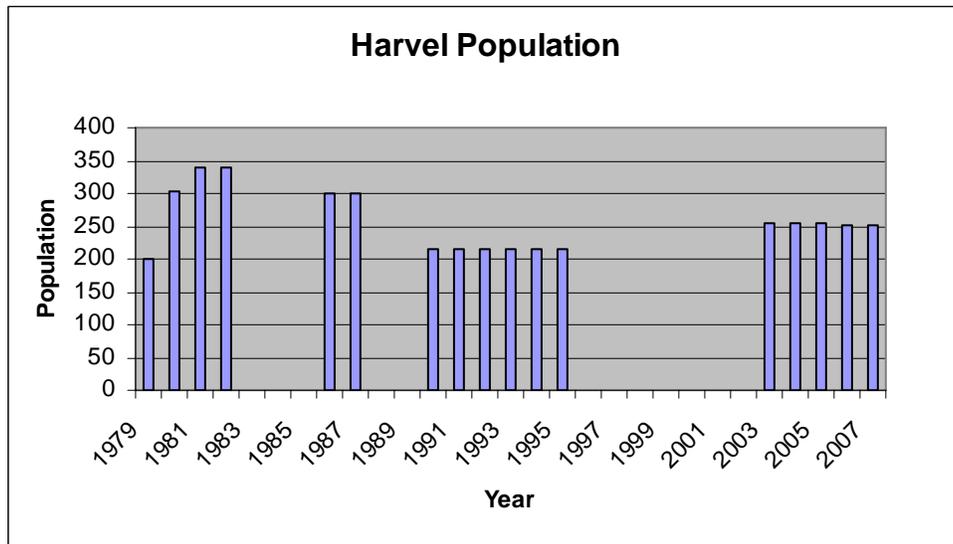
Finished in shallow sand and gravel deposits located in Section 34, T.11N., R.4W., Montgomery County. The well was drilled to a depth of 35 feet in 1986 and was tested at 183 gallons per minute (gpm) with 2 feet of drawdown from a static water level of 8 feet. The well is currently rated at about 175 gpm but is pumped around 150 gpm.

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 Harvel; the Village of Raymond to the southwest in Montgomery County. Raymond mainly uses one well (No. 5) for its supply and has Well No. 4 as an emergency well. These two wells are finished

in sand and gravel at depths of 54 and 52 feet, respectively. Well Nos. 4 and 5 are rated at about 140 gpm each. The village also has Well Nos. 2 and 3, both finished in sand and gravel at 39 and 36 feet, as backup for their supply.

Resources with 10 miles of Harvel.

Municipal Groundwater Supplies

Towns within 5 to 10 miles of Harvel include: Palmer and Morrisonville in Christian County, and Farmersville, Honey Bend and Waggoner all in Montgomery County.

Honey Bend does not report a municipal water supply and it is assumed that the residents use domestic wells for their water needs.

The Village of Palmer uses two wells located in Section 35, T.12N., R.3W., Christian County. Their wells are finished in sand and gravel deposits at depths of 76 and 85 feet below land surface. These wells reportedly are run at rates of around 70 gpm for their supply.

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.

The Village of Farmersville uses seven shallow sand and gravel wells located in Sections 4, 5, 8, 18, 19, and 30 in T.11N., R.5W., Montgomery County. They range in depth from 45 to 130 feet and their rates range from 8 to 40 gpm.

The Village of Waggoner uses four sand and gravel wells (Nos. 1 - 4) located in Sections 20, 29 and 30, T.11N., R.5W., Montgomery County. They range in depth from 52 to 68 feet and are rated at rates from 20 to 60 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 Harvel are highlighted. Figure 1 indicates that sand and gravel deposits are variable throughout most of the Harvel area with the exception of what is termed 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* (Burriss, et. al. 1981).

The bedrock map (Figure 2) indicates poor availability of groundwater from the bedrock throughout the Harvel 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 Harvel 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 currently uses are capable of providing groundwater to meet the village needs. Harvel, along with Palmer, Morrisonville and Raymond, all collect groundwater from a reliable strip aquifer located in this area. The aquifer runs from the northeast 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 next to any that fail would be recommended if no additional water is required. Cooperative Report 6 (Burris, 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 Harvel Area

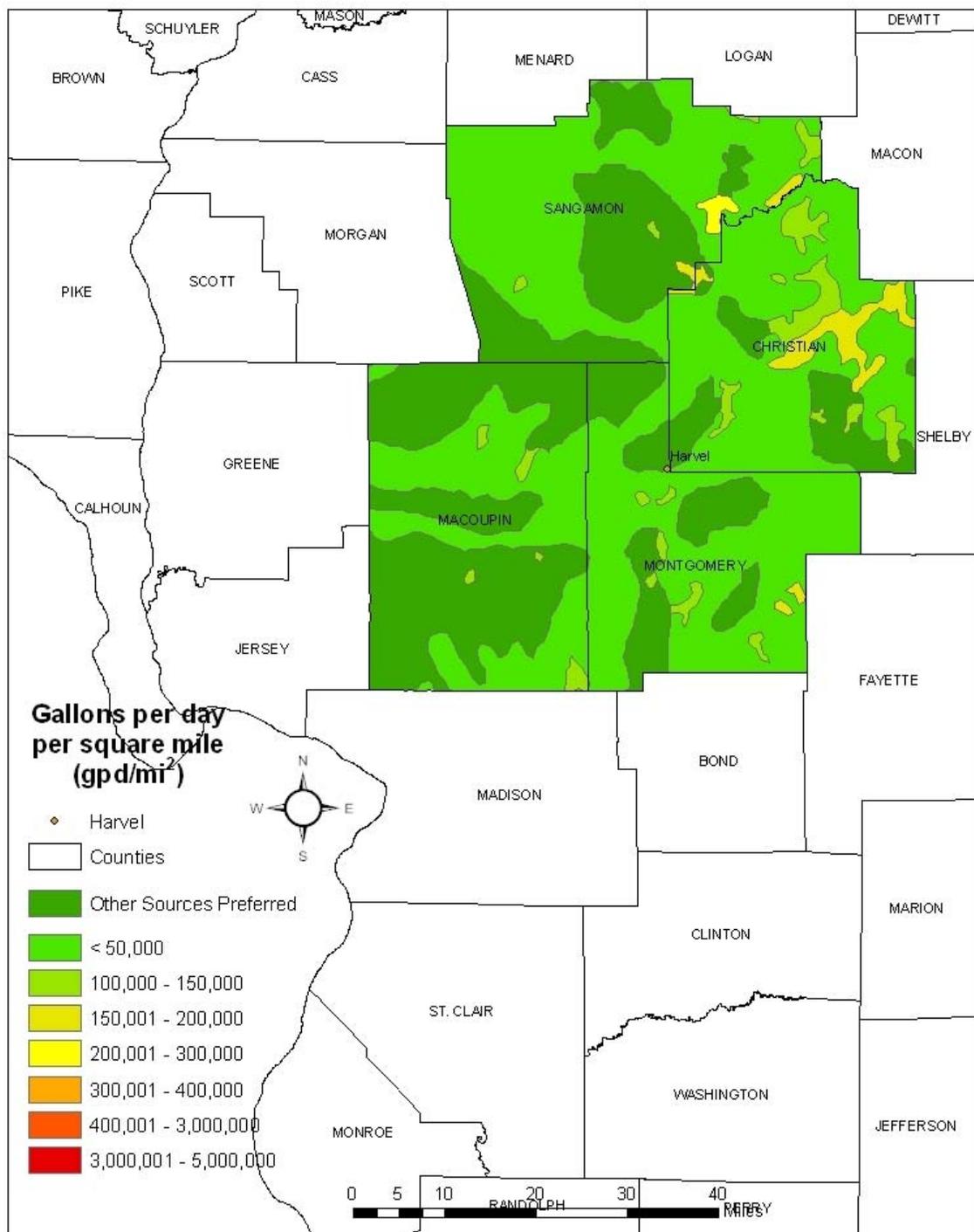


Figure 1.

Estimated Potential Yields of Shallow Bedrock Aquifers in Harvel Area

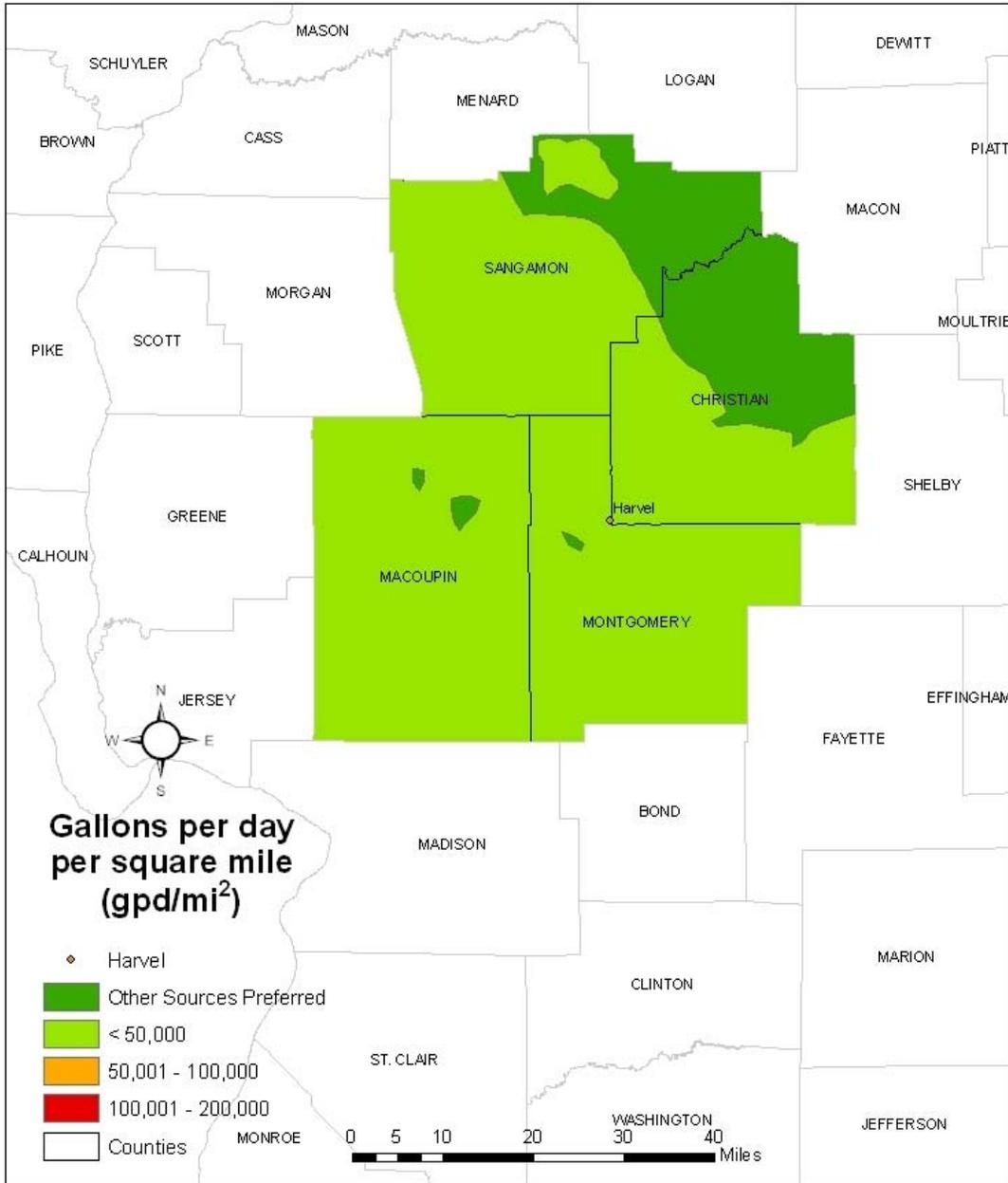


Figure 2.

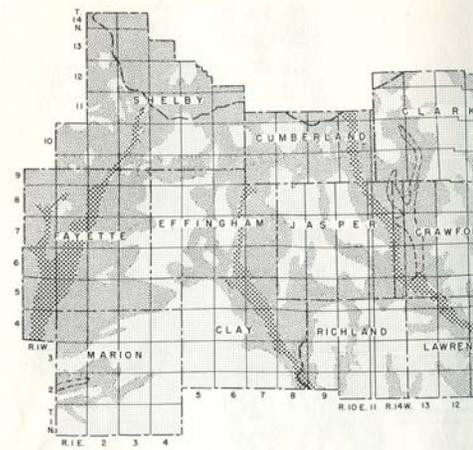
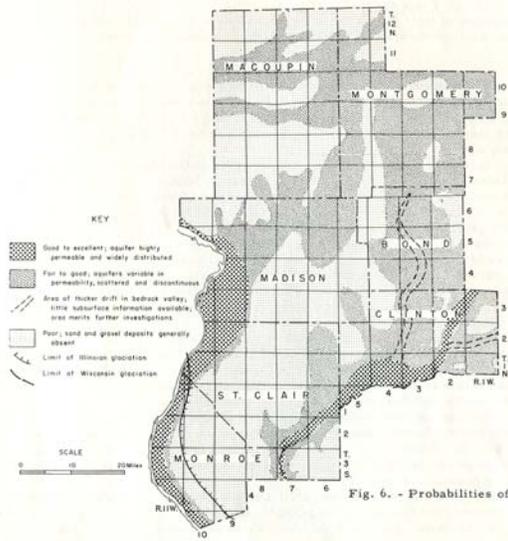


Figure 3.

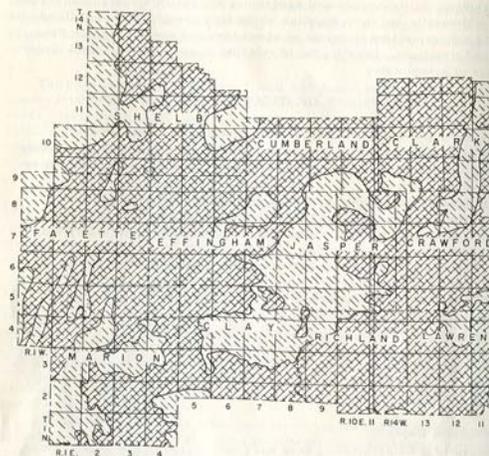
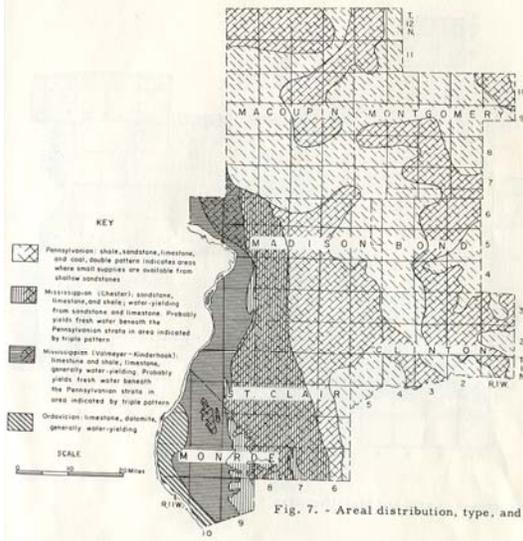


Figure 4.

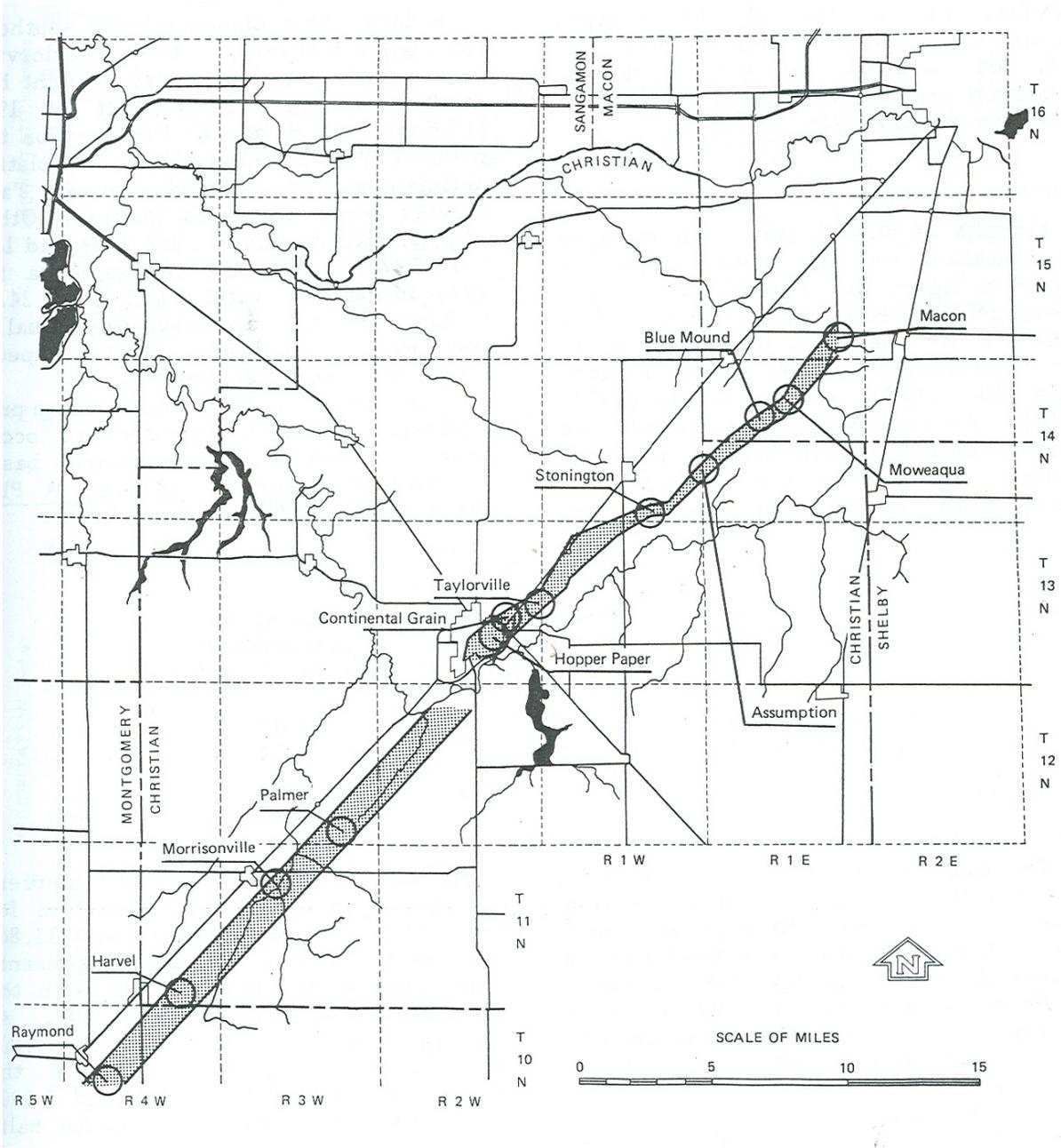


Figure 5. Municipality and well field locations for the Central Illinois Strip Aquifer. (Burriss, et.al. 1981)

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 Harvel 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.