

Unconsolidated Aquifer Systems of LaGrange County, Indiana

by
Indiana Department of Natural Resources
Division of Water
1987

The following is a summary of the availability of ground water in LaGrange County and was derived from the Indiana Department of Natural Resources 1987 publication Water Resource Availability in the St. Joseph River Basin, Indiana. The full report describes the availability, distribution, quality, and use of ground and surface water in the St. Joseph River Basin and can be viewed and downloaded at <http://www.in.gov/dnr/water>.

Unconsolidated deposits of glacial sands and gravels are the principle source of ground water in LaGrange County. Six unconsolidated aquifer systems have been mapped and defined on the basis of geologic environments and aquifer characteristics. Due to the availability of prolific unconsolidated aquifer systems and the extreme limitations of shale materials, the underlying bedrock is generally not used as an aquifer resource.

Nappanee Aquifer System

This aquifer system is composed of interbedded medium to coarse sand and gravel zones contained within a thick till sequence. The individual layers of sand and gravel range from 3-10 feet in thickness. Individual aquifers thicken locally to 30 feet or more but are seldom more than one to two square miles in area. It is not uncommon to have two or more of the aquifer units at an approximate elevation of 750 feet mean sea level (msl). This aquifer system is also present under the glacial till plain in western Elkhart and eastern St. Joseph Counties. This is an area of moderate to good ground-water availability (50-600 gallons per minute; gpm). This system, exclusive of areas where surface and gravel is present, is only slightly susceptible to contamination.

Topeka Aquifer System

The Topeka Aquifer System is located in two separate areas in the basin. The northernmost occurrence of this system is just south of Topeka, Indiana, in LaGrange County, and extends southward into Noble County. The other occurrence of the Topeka Aquifer System covers approximately five square miles in north central Noble County. The Topeka Aquifer System consists of up to 126 feet of near surface sands and gravels overlying till. The till sequence that underlies this near surface sand and gravel consists of clay units alternating with up to four separate sand and gravel layers. In most areas of this system, however, there is only one (0-60 feet thick) sand and gravel zone at depth. The majority of existing wells in these regions utilize the more continuous deeper sand and gravel aquifer rather than the near surface deposits. In areas where there is more than one aquifer present, the minor aquifers are only locally

continuous. Ground-water availability is generally good in this area (100-600 gpm). The surficial sand and gravel deposits are highly susceptible to contamination and the deeper aquifers are slightly susceptible.

Natural Lakes and Moraines Aquifer System

The Natural Lakes and Moraines Aquifer System normally contains at least two potential sand and gravel aquifers, one near the surface, the other at depth. The surface and near surface aquifers vary from 10 to 50 feet in thickness and typically occur within 100 feet of the ground surface. These surface sand and gravel layers are often continuous over many square miles and may be related to the thick surficial outwash deposits to the west. Often, the near surface aquifers are directly connected to areas of surficial sands and gravels and thus are more prone to contamination than are the deeper sand and gravel aquifers.

The deeper sand and gravel aquifers of the Natural Lakes and Moraines Aquifer System are more variable in depth and thickness, and typically occur as discontinuous lenses and layers below a thick clay layer. They are usually 10 to 30 feet thick and occur at depths of 100 feet or more. Because these deeper sands and gravels occur below or within thick clays, they are less susceptible to surface contamination. Most of the wells in the Natural Lakes and Moraines Aquifer System are completed at depths shallower than the deeper aquifers of this system. This is an area of irregular, but generally good ground-water availability (25-800 gpm). The system, exclusive of surficial and near surface sand and gravel, is moderate to slightly susceptible to contamination.

Kendallville Aquifer System

The Kendallville Aquifer System is characterized by fairly thin sand and gravel lenses contained within a thick clay sequence. Individual sand and gravel aquifers are usually 5 to 30 feet in thickness although they may be up to 50 feet thick in localized areas. The depth to a productive aquifer is quite variable although it is usually at least 90 feet below the ground surface. In some local areas where the clays are thick, depths to the aquifers may be over 200 feet. Surface and near surface sand and gravel is largely absent although it does occasionally occur as localized discontinuous patches. The Kendallville Aquifer System grades into the Natural Lakes and Moraines Aquifer System to the west and is distinguished from the western system by the lack of surface and near surface sand and gravel deposits, and by the less continuous and more variable deeper deposits. Due to the discontinuous nature of sand and gravel deposits and the lack of surficial sand and gravel, the Kendallville Aquifer System is less prone to contamination. This is an area of limited to good ground-water availability (25-600 gpm).

Howe Outwash Aquifer System

The Howe Outwash Aquifer System occurs in the northern third of LaGrange County. The prevailing character of this aquifer system is moderately thick near surface sand and gravel

deposits that overlie an altered till plain. The near surface outwash deposits are the most extensive granular deposits in this system and vary from 15-135 feet in thickness. Within the underlying till sequence, clay zones alternate with sand and gravel layers. These sand and gravel layers average 5-25 feet in thickness, although some localized lenses reach thicknesses of 100 feet. The tops of the sand and gravel lenses characteristically occur between 800-850 feet mean sea level (msl) in the western portion of the aquifer system. This system typically occurs at progressively higher elevations to the east; two or more sand and gravel deposits often occur at depth within the till sequence, but are only continuous locally. This is an area with good to excellent ground-water availability (100-1000 gpm). The surficial deposits are highly susceptible to contamination and the deeper sand and gravels are moderately so.

An anomaly in the Howe Aquifer System is present around Pigeon Lake, North and South Twin Lakes, and Still Lake west of Howe. Surrounding this group of lakes is an unexpectedly thick clay sequence within the aquifer system. Surficially, this region is similar to the remainder of the Howe Aquifer System in that it is underlain by sand & gravel. However, below this upper zone, the lake area contains clay layers ranging from 25 to 180 feet in thickness, which is much greater than the depth in the Howe System. This is an area of moderate ground-water availability (5-100 gpm). This system, exclusive of the surficial sand and gravel, is only slightly susceptible to contamination.

St. Joseph Aquifer System and Tributary Valleys

The St. Joseph Aquifer System is composed of fine to medium sand with zones of coarse sand and gravel. Interspersed within these deposits are thin clay or glacial till units of limited areal extent. The St. Joseph Aquifer System varies from 20 feet to over 400 feet in thickness within the basin. Numerous high capacity industrial, municipal and irrigation wells obtain water from this aquifer which constitutes one of the major aquifer systems in the state. This aquifer system is an area of excellent ground-water availability (100-1500 gpm) and is highly susceptible to ground-water contamination.

The Tributary Valleys Aquifer System is similar to the main stem St. Joseph Aquifer System, but often contains coarser outwash deposits. The surficial sand and gravel deposits of this system are highly susceptible to contamination and the deeper aquifers are slightly susceptible.

Registered Significant Ground-Water Withdrawal Facilities

There are 132 registered significant ground-water withdrawal facilities using unconsolidated aquifers in the county (total of 178 wells). Most of these facilities utilize the Howe Outwash Aquifer System (101 facilities, 123 wells), Natural Lakes and Moraines Aquifer System (20 facilities, 33 wells), and the Kendallville Aquifer System (9 facilities, 18 wells). One facility uses the St. Joseph Aquifer System and Tributary Valleys (2 wells), one facility uses the Nappanee Aquifer System (1 well), and one facility uses the Topeka Aquifer System (1 well). Reported high-capacities for individual wells range from 75 to 2000 gpm. The dominant uses for

these facilities are irrigation, public water supply, and industry. Refer to the table for some details on the wells and to the map for the facilities location.

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