UNCONSOLIDATED AQUIFER SYSTEMS

KENDALLVILLE AQUIFER SYSTEM

The Kendallville Aquifer system contains discontinuous sand and gravel outwash lenses that occur at various depths within a till and mixed drift complex. Individual sand and gravel aquifers within the system commonly range from 5 to 30 feet in thickness; but there is a general increase in outwash thickness northward where local accumulations approach 95 feet. Large diameter, high-capacity wells commonly yield from 70 to 1000 gpm; although yields up to 2250 gpm have been reported. The susceptibility of this aquifer system to surface contamination varies from low to moderate. Susceptibility is low for much of the aquifer system overlain by clay-rich, protective Erie Lobe tills. However, the aquifer system in DeKalb County and many parts of Steuben County, where these tills are missing and permeable sediments occur at the surface, are significantly more susceptible to surface contamination than other parts of the system.

ABOITE AQUIFER SYSTEM

The Aboite Aquifer system, consisting of sand and gravel deposits that occur at several horizons within thick, clayey till deposits, has two distinct parts that exhibit somewhat different geohydrologic characteristics. In the northern part of the system large channel deposits are sporadic, and sand and gravel bodies are separated from the underlying carbonate bedrock by till ranging from 10 to 100 feet in thickness. Coarse-grained bodies are more abundant in the southern part of the aquifer system; and many large channel deposits directly overlying bedrock valleys form well-developed hydraulic connections with the carbonate bedrock. Aquifer thickness commonly ranges from about 5 to 20 feet, and domestic wells yield from 10 to 50 gpm. The carbonate bedrock beneath the Aboite aquifer is generally preferred for high-capacity well development. In the north, the Aboite Aquifer system, overlain by clay-rich Erie Lobe tills, is moderately susceptible to surface contamination; but in the south, where there is little if any till present and the water-bearing units are poorly confined by heterogenous surficial sediments, the system is highly susceptible.

HESSEN CASSEL AQUIFER SYSTEM

The Hessen Cassel Aquifer system contains a few thin sand and gravel lenses occurring amidst thick sequences of tills and some fine-grained glaciolacustrine deposits. This aquifer system is characterized by an overall scarcity of productive zones. The sand and gravel lenses within the system are either confined within glacial till or are directly overlying bedrock. Yields for domestic wells typically range from 10 to 30 gpm. Yields of 75 to 85 gpm are obtained from the few high-capacity wells that are developed in locally-thick outwash deposits. In general, this system has low susceptibility to surface contamination.

NEW HAVEN AQUIFER SYSTEM

The New Haven Aquifer system is made up of outwash plain sediments confined by varied sequences of till and glaciolacustrine deposits. The relatively continuous outwash aquifer that occurs within the system is commonly 5 to 10 feet in thickness and overlies bedrock directly in some places. Yields from domestic wells typically range from 5 to 20 gpm. Yields of 100 to 250 gpm are common from the few high-capacity wells that penetrate locally-thick outwash deposits. The northern part of the system is moderately susceptible to surface contamination because it is overlain by an extensive blanket of fine sand. The remainder of the system, overlain by tills, debris flow deposits, and glaciolacustrine sediment, has low susceptibility to surface contamination.

CEDARVILLE AQUIFER SYSTEM

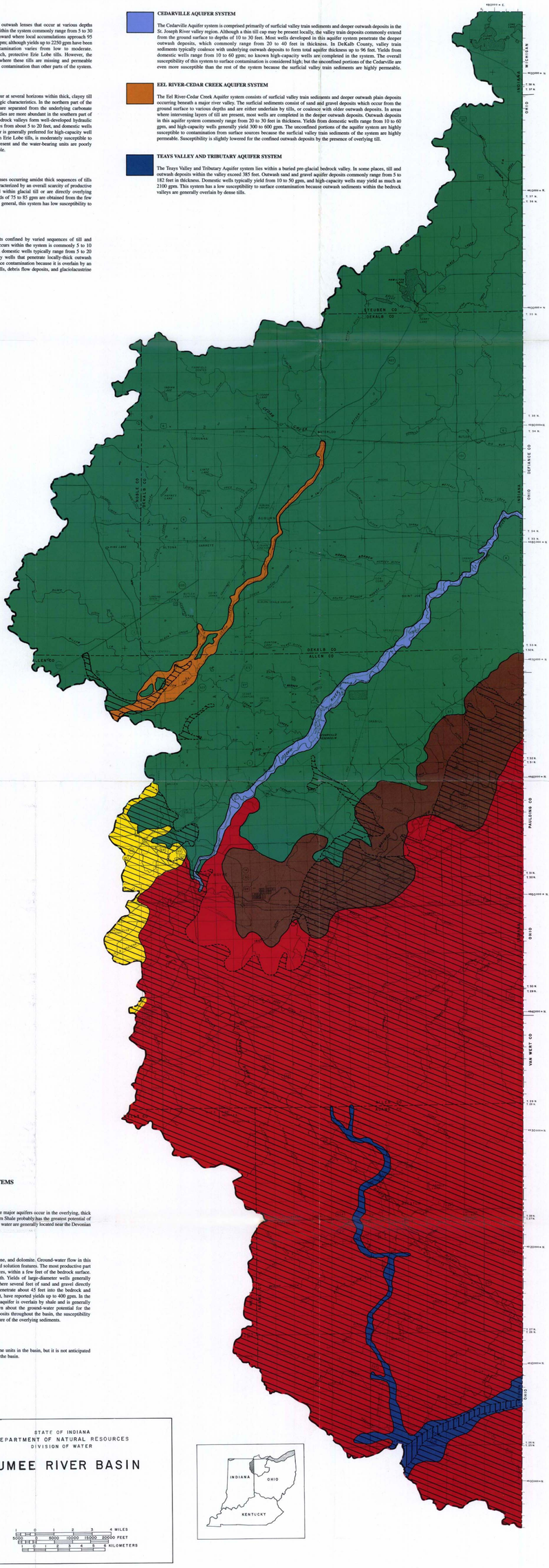
The Cedarville Aquifer system is comprised primarily of surficial valley train sediments and deeper outwash deposits in the St. Joseph River valley region. Although a thin till cap may be present locally, the valley train deposits commonly extend from the ground surface to depths of 10 to 30 feet. Most wells developed in this aquifer system penetrate the deeper outwash deposits, which commonly range from 20 to 40 feet in thickness. In DeKalb County, valley train sediments typically coalesce with underlying outwash deposits to form total aquifer thickness up to 96 feet. Yields from domestic wells range from 10 to 60 gpm; no known high-capacity wells are completed in the system. The overall susceptibility of this system to surface contamination is considered high; but the unconfined portions of the Cedarville are even more susceptible than the rest of the system because the surficial valley train sediments are highly permeable.

EEL RIVER-CEDAR CREEK AQUIFER SYSTEM

The Eel River-Cedar Creek Aquifer system consists of surficial valley train sediments and deeper outwash plain deposits occurring beneath a major river valley. The surficial sediments consist of sand and gravel deposits which occur from the ground surface to various depths and are either underlain by tills, or coalesce with older outwash deposits. In areas where intervening layers of till are present, most wells are completed in the deeper outwash deposits. Outwash deposits in this aquifer system commonly range from 20 to 30 feet in thickness. Yields from domestic wells range from 10 to 60 gpm, and high-capacity wells generally yield 300 to 600 gpm. The unconfined portions of the aquifer system are highly susceptible to contamination from surface sources because the surficial valley train sediments of the system are highly permeable. Susceptibility is slightly lowered for the confined outwash deposits by the presence of overlying till.

TEAYS VALLEY AND TRIBUTARY AQUIFER SYSTEM

The Teays Valley and Tributary Aquifer system lies within a buried pre-glacial bedrock valley. In some places, till and outwash deposits within the valley exceed 385 feet. Outwash sand and gravel aquifer deposits commonly range from 5 to 182 feet in thickness. Domestic wells typically yield from 10 to 50 gpm, and high-capacity wells may yield as much as 2100 gpm. This system has a low susceptibility to surface contamination because outwash sediments within the bedrock valleys are generally overlain by dense tills.



BEDROCK AQUIFER SYSTEMS

DEVONIAN AND MISSISSIPPIAN SHALES

Little is known about the ground-water potential of these shale units because major aquifers occur in the overlying, thick unconsolidated deposits; however, shale is not usually productive. The Antrim Shale probably has the greatest potential of these units. Wells in the Antrim that produce yields of 10 to 15 gpm of potable water are generally located near the Devonian carbonate/shale contact.

SILURIAN-DEVONIAN CARBONATES

The carbonate aquifer system is composed of limestone, dolomitic limestone, and dolomite. Ground-water flow in this system is predominately along bedrock joints, fractures, bedding planes, and solution features. The most productive part of the carbonate aquifer occurs within the upper 100 feet, and in many places, within a few feet of the bedrock surface. However, zones of relatively high permeability also occur at greater depth. Yields of large-diameter wells generally range from 100 to 500 gpm, but higher-yielding wells may be possible where several feet of sand and gravel directly overlie the bedrock surface. In Adams County, domestic wells typically penetrate about 45 feet into the bedrock and yield from 7 to 63 gpm; high-capacity wells having depths of 20 to 400 feet, have reported yields up to 400 gpm. In the northern part of the basin, including northern Allen County, the carbonate aquifer is overlain by shale and is generally not considered a significant ground-water source; however, little is known about the ground-water potential for the system in this area. Because the bedrock is overlain by unconsolidated deposits throughout the basin, the susceptibility of bedrock aquifer systems to surface contamination is dependant on the nature of the overlying sediments.

ORDOVICIAN SHALES AND LIMESTONE

Little is known about the ground-water potential of these shale and limestone units in the basin, but it is not anticipated that these units would be productive. These rocks are not used as aquifers in the basin.

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER

MAUMEE RIVER BASIN

0 1 2 3 4 MILES
5000 0 5000 10000 15000 20000 FEET
0 1 2 3 4 5 KILOMETERS

UNCONSOLIDATED AND BEDROCK AQUIFERS