Unconsolidated Aquifer Systems of Wabash County, Indiana

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Seven unconsolidated aquifer systems have been mapped in Wabash County: the Till Veneer; the Bluffton Till; the Bluffton Till Subsystem; the Bluffton Complex; the Natural Lakes and Moraines; the Wabash River and Tributaries Outwash System; and the Wabash River and Tributaries Outwash Subsystem. Boundaries of these aquifer systems are commonly gradational and individual aquifers may extend across aquifer system boundaries.

In Wabash County, the thickness of unconsolidated sediments is quite variable. Bedrock is at or near the surface in places along the Wabash River and some tributaries. However, the thickness of unconsolidated sediments exceeds 400 feet in a buried bedrock valley, which enters the county near La Fontaine and trends northwest and exits into Miami County near the Wabash River. Additionally, unconsolidated deposits are over 300 feet thick in the northwest corner of Wabash County. Elsewhere in the county, the unconsolidated deposits are commonly 50 to 125 feet thick. In Wabash County, about half of the reported wells are finished in the unconsolidated deposits.

Regional estimates of aquifer susceptibility to contamination from the surface can differ considerably from local reality. Variations within geologic environments can cause variation in susceptibility to surface contamination. In addition, man-made structures such as poorly constructed water wells, unplugged or improperly abandoned wells, and open excavations can provide contaminant pathways that bypass the naturally protective clays.

Till Veneer Aquifer System

In Wabash County, the Till Veneer Aquifer System encompasses areas where the unconsolidated material is predominantly thin glacial till and/or alluvium overlying an eroded bedrock surface. This system is mapped primarily in the southern half of the county, along portions of the Wabash River, the Mississinewa River, and the Salamonie River. Total thickness of the Till Veneer Aquifer System generally ranges from about 20 to 50 feet.

This system has the most limited ground-water resources of the unconsolidated aquifer systems in Wabash County. Potential aquifers within the Till Veneer Aquifer System are primarily thin isolated sand and/or gravel layers. Therefore, very few of the reported wells penetrating this aquifer system are completed in the unconsolidated materials, which are bypassed in favor of the more productive underlying bedrock.

This system is not very susceptible to contamination from surface sources because the near-surface materials generally have low permeability. However, there are areas where unconsolidated deposits are extremely thin. These areas are very susceptible to contamination.

Bluffton Till Aquifer System

The Bluffton Till Aquifer System is mapped mostly in the northern half of the county and primarily consists of thick clay with intratill sand and gravel layers. In Wabash County, this system ranges in thickness from about 50 feet to more than 275 feet, but is typically 80 to 120 feet thick. Saturated aquifer materials include sands and/or gravels that commonly range from 5 to 15 feet thick and are generally overlain by 40 to 80 feet of till.

In Wabash County, most of the wells in this system are completed in the underlying bedrock; however, the Bluffton Till Aquifer System is generally capable of meeting the needs of most domestic and some high-capacity users. Wells producing from the Bluffton Till Aquifer System are generally 65 to 140 feet deep. Domestic well capacities are typically 10 to 60 gallons per minute (gpm) and static water levels are commonly 20 to 60 feet below the surface.

The Bluffton Till Aquifer System has a low susceptibility to surface contamination because intratill sand and gravel units are generally separated from the surface by thick till layers.

Bluffton Till Aquifer Subsystem

Areas where unconsolidated materials are generally greater than 50 feet in thickness, yet have limited aquifer potential, are mapped as the Bluffton Till Aquifer Subsystem in Wabash County. This subsystem is mapped in about 17 percent of the county. This subsystem ranges from about 50 to 220 feet thick, but is typically less than 100 feet thick. Potential aquifer materials include thin, intratill sand and gravel deposits. Where present, aquifer materials are capped by till that is generally 40 to 120 feet thick.

More than 80 percent of wells started in the Bluffton Till Aquifer Subsystem in Wabash County are completed in the underlying bedrock aquifer system. However, this subsystem is capable of meeting the needs of some domestic users in the county. The few wells producing from the Bluffton Till Aquifer Subsystem are completed at depths of 50 to 218 feet.

This subsystem is generally not very susceptible to surface contamination because intratill sand and gravel lenses are overlain by thick till deposits. Wells producing from shallow aquifers are moderately susceptible to contamination.

Bluffton Complex Aquifer System

The Bluffton Complex Aquifer System is mapped over a large portion of Wabash County. This aquifer system is characterized by deposits that are quite variable in materials and thickness. A

thick till commonly overlies sand and gravel aquifer deposits. This system generally has multiple layers of intratill sands and gravels of various thickness and lateral extent. The main aquifer deposits are typically deeper, thicker, and more continuous than the shallower sands and gravels in this system. In Wabash County, this system is up to 250 feet thick. Saturated aquifer materials in the Bluffton Complex Aquifer System are generally 10 to 25 feet thick and are overlain by a till cap which is commonly 30 to 75 feet thick.

This system is capable of meeting the needs of domestic and most high-capacity users in Wabash County. Wells in this system are typically completed at depths of 75 to 125 feet. Domestic well yields are commonly 10 to 60 gpm and static water levels are generally 20 to 50 feet below the surface. There are 10 registered significant ground-water withdrawal facilities (20 wells) utilizing this system and individual wells produce 130 to 1500 gpm.

> Part of the Bluffton Complex Aquifer System overlies a deep buried bedrock valley in southern Wabash County. The total unconsolidated thickness exceeds 400 feet in many places. Only a few wells that utilize the deeper aquifers within the buried bedrock valley have been reported. These wells indicate that the deep sand and gravel deposits are 10 to 60 feet thick in places. Reported domestic well yields are greater than 50 gpm and high-capacity wells yield in excess of 300 gpm.

The Bluffton Complex Aquifer System is not very susceptible to contamination because thick clays overlie the aquifer materials.

Natural Lakes and Moraines Aquifer System

The Natural Lakes and Moraines Aquifer System in Wabash County is mapped north of the Eel River and is a complex aquifer system typically with multiple intratill sand and gravel seams. Unconsolidated deposits range in thickness from about 100 feet to over 250 feet. Thick surficial clays predominate and are generally 50 to 110 feet thick. A few localized surficial sand and gravel deposits are reported and range from 20 to 50 feet thick; however, the static water levels are typically deep and these deposits are seldom used.

This system is capable of meeting the needs of domestic and some high-capacity users in Wabash County. Wells completed in this aquifer system range in depth from 30 to 241 feet deep. However, the wells are typically 60 to 130 feet deep. Aquifer thickness is generally between 15 and 30 feet thick. In addition, several areas have two or more aquifers ranging in thickness from 5 to 15 feet. Domestic well yields are commonly 10 to 75 gpm and static water levels are typically 15 to 50 feet below the surface. There are 2 registered significant ground-water withdrawal facilities (4 wells) utilizing this system with individual wells producing up to 70 gpm.

The Natural Lakes and Moraines Aquifer System is generally not very susceptible to surface contamination because thick clay deposits overlie intratill sand and gravel seams. Wells producing from shallow aquifers are moderately to highly susceptible to contamination.

Wabash River and Tributaries Outwash Aquifer System

The Wabash River and Tributaries Outwash Aquifer System is mapped along the Eel River and along the Wabash River in the western portion of the County. Large amounts of outwash sand and gravel from the receding glaciers were deposited in the stream valley. This system exceeds 150 feet in thickness in a few places with up to 90 feet of continuous sand and gravel in some places. However, the outwash is typically 25 to 75 feet thick with the thickness of saturated sands and gravels generally ranging from 15 to 50 feet. In some areas 10 to 45 feet of sandy clay or silt occurs at the surface or below the surficial sand and gravels.

These sand and gravel deposits have adequate potential for domestic and most high-capacity users. Well depths are commonly 40 to 100 feet. Domestic well yields are commonly 10 to 60 gpm and static water levels are generally 10 to 25 feet below the surface. Five registered significant ground-water withdrawal facilities (10 wells) currently use the Wabash River and Tributaries Outwash Aquifer System in Wabash County. Reported yields for high-capacity wells in this aquifer system are 100 to 1100 gpm.

> In places, this system overlies a deep buried bedrock valley. The total unconsolidated thickness exceeds 300 feet in many places. The few wells that use the deeper aquifers of the buried valley have sand and gravel thicknesses that typically range from 20 to over 45 feet. Reported domestic well yields are greater than 50 gpm and there are no high-capacity wells in the buried valley but yields would be expected to be in excess of 500 gpm.

This aquifer system is highly susceptible to contamination from surface sources in areas that lack overlying clay layers. The system is only moderately susceptible where it is overlain by thick clay or silt deposits.

Wabash River and Tributaries Outwash Aquifer Subsystem

This system is primarily mapped along part of the Eel River in northern Wabash County and along portions of the Wabash River along the Miami County line and the city of Wabash. Saturated sand and gravel layers are generally 7 to 20 feet thick and are commonly overlain by silt, sandy clay, or clay ranging from 10 to 30 feet thick.

The Wabash River and Tributaries Outwash Aquifer Subsystem has the potential to meet the needs of domestic and some high-capacity users. Few wells utilize this system in Wabash County. There is an only one registered high-capacity facility (5 wells) with reported yields up to 350 gpm.

Areas within this aquifer system that have overlying clay or silt deposits are moderately susceptible to surface contamination; whereas, areas that lack overlying clay or silt deposits are highly susceptible to contamination.

Registered Significant Ground-Water Withdrawal Facilities

There are 18 registered significant ground-water withdrawal facilities (39 wells) using unconsolidated aquifers in the county. These wells utilize the Bluffton Complex Aquifer System, the Natural Lakes and Moraines Aquifer System, the Wabash River and Tributaries Outwash Aquifer System, and the Wabash River Tributaries Outwash Aquifer Subsystem. Reported capacities for individual wells range up to 1500 gpm. Uses for these facilities are primarily public water supply and irrigation. Refer to the table for details on the wells and to the map for facility locations.

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