

# **Unconsolidated Aquifer Systems of Jackson County, Indiana**

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March 2004  
Modified 2011

Six unconsolidated aquifer systems have been mapped in Jackson County: the Unglaciaded Southern Hills and Lowlands / Dissected Till and Residuum; the Alluvial, Lacustrine and Backwater Deposits; the Scottsburg Lowland Till Subsystem; the Buried Valley; the White River and Tributaries Outwash; and the White River and Tributaries Outwash Subsystem. Boundaries of these aquifer systems are commonly gradational, and individual aquifers may extend across aquifer system boundaries.

Most of Jackson County has been covered by pre-Wisconsin glacial sediments followed by further deposition of Wisconsin outwash, alluvial and lacustrine sediments. However, there are areas along the western third of the county and southeast of Brownstown where glacial materials are absent and only thin deposits of bedrock residuum overlie bedrock.

Thickness of sediments overlying bedrock ranges from 3 feet in areas where only residuum is present to as much as 130 feet where glacially-derived till, outwash, alluvial, and lacustrine deposits are present.

## **Unglaciaded Southern Hills and Lowlands / Dissected Till and Residuum Aquifer System**

The Unglaciaded Southern Hills and Lowlands / Dissected Till and Residuum Aquifer System covers areas along the western edge of Jackson County, areas to the south and east of Brownstown (Brownstown Hills), and upland areas where thin glacially-derived sediments overlie bedrock. They are mapped as one system because they are similar in composition and aquifer characteristics.

Unconsolidated deposits of the Unglaciaded Southern Hills and Lowlands Aquifer System lie beyond the pre-Wisconsin glacial limit and consist predominantly of thin, eroded bedrock residuum. Thicknesses of these sediments typically range from 3 to 25 feet; however, some thicker deposits occur in areas near the White River where eolian sand deposits are present. In upland areas within the limits of glaciation, the unconsolidated deposits of the Dissected Till and Residuum Aquifer System consist of pre-Wisconsin tills and deposits of Wisconsin age loess, alluvium, lacustrine silt and clay, and colluvium. Thicknesses of these sediments are generally less than 50 feet but are commonly 10 to 30 feet in Jackson County. These areas may also include scattered intratill sand and gravel deposits up to 5 feet thick.

The Division has no record of drilled wells producing from the Unglaciaded Southern Hills and Lowlands / Dissected Till and Residuum Aquifer System because drillers prefer to complete wells in the underlying bedrock. However, large diameter bucket-rig wells may meet the needs of some domestic users.

Because of the low permeability of the surface materials, this system is not very susceptible to contamination from surface sources.

### **Alluvial, Lacustrine, and Backwater Deposits Aquifer System**

The Alluvial, Lacustrine, and Backwater Deposits Aquifer System in Jackson County is mapped along a portion of the South Fork Salt Creek in the northwest part of the county, along the Muscatatuck and Vernon Fork Muscatatuck Rivers in the east and southeast part of the county, and along small tributaries near the north central part of the county. Unconsolidated deposits within this system come from two sources. The first is alluvium deposited by streams along with colluvium eroded from valley walls and upland areas. The second source is glaciolacustrine deposits formed in bodies of relatively stagnant water.

Total thickness of unconsolidated materials overlying bedrock in this system is commonly less than 50 feet. Fine sand and gravel lenses, where present, are typically less than 5 feet thick and may be confined within the glaciolacustrine deposits or directly overlie bedrock. This aquifer system is a limited resource and the Division has no record of wells actually producing from these deposits. The potential does exist, however, for completion of adequate domestic wells in some places where unconsolidated deposits are thicker than 25 feet. In many places large diameter bucket-rig wells could meet the needs of some domestic users.

This aquifer system is generally marked by surface deposits of soft silt and clay that have a low to moderate susceptibility to surface contamination.

### **Scottsburg Lowland Till Aquifer Subsystem**

The Scottsburg Lowland Till Aquifer Subsystem is mapped in portions of central and eastern Jackson County. This aquifer system is limited with large diameter bucket type wells completed in unconsolidated deposits that are often drilled below the aquifer unit in order to provide extra borehole space for groundwater storage. Also, approximately 56% of wells in the mapped area are completed in bedrock.

Well depths in the Scottsburg Lowland Till Aquifer Subsystem range from 25 to 97 feet. Thicknesses of sand and gravel aquifer units vary widely ranging from less than one foot, to as much as 33 feet. However, upper portions of the thicker deposits are often noted as “dry”. Domestic well yields are generally less than 9 gpm. A few wells note greater yields, however many are associated with deeper static water levels and significant to

complete drawdown. Static water levels generally range from 3 to 54 feet below land surface.

The Scottsburg Lowland Till Aquifer Subsystem is generally not very susceptible to surface contamination because sand and gravel aquifer units are overlain by thick clay deposits. However, in some isolated places thin to no clay deposits overlie the aquifer resource. These areas are considered at high risk to contamination.

### **Buried Valley Aquifer System**

The Buried Valley Aquifer System consists of aquifer materials deposited in pre-glacial bedrock valleys. There is one main buried bedrock valley system mapped in Jackson County. It includes an area that extends from approximately 2.5 miles south of Seymour and fans out to the south-southwest towards the Muscatatuck River. It cuts as deeply as 125 feet into rock of the Mississippian Borden Group.

Well depths range from 25 to 114 feet, but are typically 35 to 60 feet deep. Aquifer materials include multiple outwash deposits that vary in thickness. In some cases drillers report more than one outwash unit separated by clay materials that range from 4 to 20 feet thick. Upper outwash deposits range from 1 to 94 feet, but are typically 5 to 30 feet. Thickness of the lower outwash deposits ranges from 2 to 15 feet. Some well records also note clay underlying the lower outwash deposits. Most wells do not penetrate the full thickness of the aquifer system.

Domestic well yields range from 1 to 34 gpm but are typically 4 to 20 gpm. Static water levels range from 5 to 81 feet below surface but are typically 15 to 30 feet below surface. The Division has no records of high-capacity wells in this aquifer system. However, in some areas this aquifer system has sufficient thickness of sand and gravel to support high-capacity wells.

Because its intratill sand and gravel units are overlain by thick till and lacustrine deposits, the Buried Valley Aquifer System is generally not very susceptible to surface contamination.

### **White River and Tributaries Outwash Aquifer System**

The White River and Tributaries Outwash Aquifer System is located throughout portions of central and eastern Jackson County. This system contains large volumes of outwash and alluvial deposits that filled the main river valley of the East Fork White River. Thickness of unconsolidated deposits overlying bedrock can be as much as 130 feet.

Aquifer materials include predominantly sand and gravel deposits that range from 6 to 96 feet thick but are more commonly from 20 to 60 feet thick. However, outwash areas

mapped near the Muscatatuck and Vernon Fork Muscatatuck Rivers will include thinner aquifer deposits and more fine-grained sands and lacustrine sediments.

Well depths are typically 35 to 70 feet below surface. In some areas 6 to 15 feet of clay or silt overlie the aquifer materials. Static water levels range from 4 to 20 feet below surface but are typically 5 to 15 feet. Because the level of ground water is near the surface, most of the aquifer materials are saturated.

This system has the greatest potential of any aquifer system in Jackson County and can meet the needs of domestic and high-capacity users. Domestic yields range from 7 to 30 gpm. There are 25 registered significant water withdrawal facilities (67 wells) in this system. Typical yields for high-capacity wells range from 100 to 1000 gpm.

In areas that lack overlying clays, this aquifer system is highly susceptible to contamination from surface sources. Where the aquifer system is overlain by clay deposits, the aquifer is moderately susceptible to surface contamination.

### **White River and Tributaries Outwash Aquifer Subsystem**

The White River and Tributaries Outwash Aquifer Subsystem includes areas adjacent and parallel to the White River and Tributaries Outwash Aquifer System. This system typically occupies a higher topographic position than that of the outwash system and is marked by thinner outwash deposits overlain by sandy clay, clay, lacustrine, or eolian-derived loess and sand. These materials overlie aquifer deposits and range from 1 to 28 feet thick but are typically between 10 and 20 feet thick.

Total thickness of unconsolidated deposits overlying bedrock ranges from 27 to 130 feet. The thickness of aquifer materials within the unconsolidated deposits ranges from 1 to 74 feet but are typically between 10 and 35 feet. Well depths range from 12 to 114 feet below surface but are typically between 30 to 60 feet below surface. Many wells do not penetrate the full thickness of the aquifer system.

This aquifer system has the potential to meet the needs of domestic and some high-capacity users. Domestic yields range from 5 to 20 gpm. Static water levels range from 5 to 30 feet below surface but are commonly between 10 and 25 feet below surface. There are three registered significant water withdrawal facilities (11 wells) that report yields ranging from 90 to 350 gpm.

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

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