Potentiometric Surface Map of the Unconsolidated Aquifers of Dearborn County, Indiana

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Dearborn County is located in the southeastern portion of Indiana, and is bounded by the counties of Franklin, Ohio, and Ripley to the north, south, and west, respectively. The state of Ohio borders the county to the east, and the state of Kentucky borders the county to the southeast. Nearly the entire county lies within the Ohio River Basin with small portions in the northwest, northeast, and east within the Whitewater River Basin and a small area in the southeast within the Great Miami River Basin.

The potentiometric surface is a measure of the pressure on water in a water bearing formation. Water in an unconfined aquifer is at atmospheric pressure and will not rise in a well above the top of the aquifer, in contrast to groundwater in a confined aquifer which is under hydrostatic pressure and will rise in a well above the top of the water bearing formation.

The Potentiometric Surface Map (PSM) of the unconsolidated aquifers of Dearborn County is mapped by contouring the elevations of 143 static water-levels reported on well records received primarily over a 50 year period. These wells are completed in aquifers at various depths, and typically, under confined conditions (bounded by impermeable layers above and below the water bearing formation). However, some wells are completed under unconfined (not bounded by impermeable layers) settings. The mapped potentiometric surface contours are primarily for the upper 100 feet of the unconsolidated materials and utilize data for wells 100 feet or less in depth.

For most of Dearborn County, unconsolidated and bedrock aquifers are very limited groundwater resources. According to the Unconsolidated Aquifer Systems of Dearborn County map produced by Indiana Department of Natural Resources, Division of Water, the Dissected Till and Residuum Aquifer System covers 92 percent of Dearborn County. It can be characterized by thin till deposits with very thin layers of sand and gravel, or thin, eroded bedrock deposits. There are few reported wells in the county utilizing this aquifer system. The mapped potentiometric contours shown are predominately located in areas with sand and gravel material of the Whitewater and Ohio River Outwash Systems, which are more suitable aquifer systems to meet the needs of domestic and high-capacity users.

Static water-level measurements in individual wells used to construct county PSM's are indicative of the water-level at the time of well completion. The groundwater level within an aquifer constantly fluctuates in response to rainfall, evapotranspiration, groundwater movement and pumpage. Therefore, measured static water-levels in an area may differ due to local or seasonal variations. Because fluctuations in groundwater are typically small, static water-levels can be used to construct a generalized PSM. As a general rule, but certainly not always, groundwater flow approximates the overlying topography and intersects the land surface at major streams.

Universal Transverse Mercator (UTM) coordinates for the water wells were either physically obtained in the field, determined through address geocoding, or reported on water well records. The location of the majority of the water well records used to make the PSM were field verified. Elevation data were obtained from a digital elevation model. Quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Potentiometric surface elevations range from a high of 1010 feet mean sea level (msl) in the western portion of the county, to a low of 440 feet msl in the southeast portion of the county near the Ohio River. Regional groundwater flow direction is generally to the southeast towards the Ohio River or east towards the Whitewater River. Localized groundwater flow is towards their tributaries.

The county PSM can be used to define the regional groundwater flow path and to identify significant areas of groundwater recharge and discharge. County PSM's represent overall regional characteristics and are not intended to be a substitute for site-specific studies.