

# **Potentiometric Surface Map of the Unconsolidated Aquifers of Miami County, Indiana**

by  
Glenn E. Grove  
Division of Water, Resource Assessment Section  
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Miami County, Indiana is located in the north-central section of the state and lies within the Upper Wabash River Basin.

The Potentiometric Surface Map (PSM) of the unconsolidated aquifers of Miami County was mapped by contouring the elevations of approximately 860 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 were completed under unconfined (not bounded by impermeable layers) settings. 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 water bearing formation, in contrast to water in a confined aquifer which is under hydrostatic pressure and will rise in a well above the top of the water bearing formation.

The mapped potentiometric surface contours primarily utilize data for wells 100 feet or less in depth. If the shallow data was sparse or unavailable in an area, deeper wells were used to complement the mapping. There are portions of central and southern Miami County where unconsolidated well data is lacking and/or consists of thin or unproductive deposits, therefore, the potentiometric surface elevation contours have not been extended through these areas.

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; however, 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.

Unconsolidated potentiometric surface elevations in Miami County range from a high of 840 feet mean sea level (msl) in the north-central section of the county, to a low of 630 feet msl in the west-central portion along the Wabash River. Groundwater flow direction is generally toward the Wabash River and its 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.