

# Potentiometric Surface Map of the Unconsolidated Aquifers of Union County, Indiana

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Union County, Indiana is located in the east-central portion of the state and is within the boundaries of two river basins. The western two-third of the county is located within the Whitewater River Basin and the remaining part of the county is located in the Lower Great Miami River Basin.

The potentiometric surface mapped (PSM) contour elevations represent lines of equal elevation relative to the measured groundwater levels in wells. In general, wells completed in a confined aquifer system are bound by impermeable layers and will have static water levels under hydrostatic pressure causing the water level to rise above the elevation of the aquifer resource. In contrast, an unconfined aquifer system is not bound by impermeable layers; therefore, the water level will not be under hydrostatic pressure and will not rise above the aquifer resource.

Static water level measurements in individual wells used to construct the potentiometric surface map are indicative of the water level at the time of well completion. Therefore, current site specific conditions may differ due to local or seasonal variations in measured static water levels.

Coordinate locations of water well records were physically obtained in the field, determined through address geocoding, or reported on water well records. Elevation data were obtained from a digital elevation model (DEM). Elevation and location quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Well depths 100 feet or less were a priority in mapping the potentiometric surface in Union County. However, deeper wells were used to compliment the mapping in areas where wells at depths of less than 100 feet were sparse. There are 492 unconsolidated located water well records in the county with 465 within the priority depth range.

Much of Union County exhibits limited unconsolidated aquifer potential. However, many wells, in these areas are large diameter bucket wells with porous concrete casing that utilize thin sand and gravels seams or reportedly “wet” clays (Maier, 2011). These wells make up about 55 percent of all unconsolidated wells in the county and are extremely limited in flow capability.

Potentiometric surface elevations range from a high of 1110 feet mean sea level (msl) to the northeast, to a low of 750 feet msl along a small portion of the East Fork Whitewater River in the east-central part of the county. Portions of the county are generally lacking in data, primarily in

areas where ridge top highs and steep, incised valleys are present. Potentiometric surface elevation contours, therefore, have not been extended throughout these areas.

Generalized groundwater flow direction for Union County is towards major drainage relevant to the basin. Therefore, groundwater flow for the Whitewater River Basin is generally towards the East Fork Whitewater River and its tributaries. Along the eastern part of the county, within the Lower Great Miami River Basin, groundwater flow is generally south and east towards Little Four Mile Creek and southeast approaching Indian Creek.

Maier, 2011: Unconsolidated Aquifer Systems of Union County, Indiana. Indiana Department of Natural Resources, Division of Water, Aquifer Systems Map 80-A.