

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

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Vanderburgh County is located in southwest Indiana, and is bounded by the counties of Posey, Gibson and Warrick to the west, north and east, respectively. The state of Kentucky borders the county to the south. The majority of the county lies within the Ohio River Basin, while the north-central, northwest and west-central portions of the county are situated within the Lower Wabash River Basin.

The Potentiometric Surface Map (PSM) of the unconsolidated aquifers of Vanderburgh County was mapped by contouring the elevations of 276 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 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.

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.

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. If the shallow data was sparse or unavailable in an area, wells greater than 100 feet in depth were used to complement the mapping. Large portions of Vanderburgh County do not have unconsolidated

potentiometric surface elevations because these areas are either lacking in data and/or covered by thin or unproductive unconsolidated deposits.

Potentiometric surface elevations range from a high of 360 feet mean sea level (msl) to a low of 340 feet msl and were only mapped in the southern part of the county. Regional groundwater flow direction is generally towards the Ohio River.

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.