HYDROLOGY OF UNCONSOLIDATED AQUIFER

GENERAL HYDROLOGY

Unconsolidated deposits of Tertiary and Quaternary age form the principal aquifer of Gray County. The water-bearing characteristics of the aquifer differ from place to place, depending on the type of formation and the location, and are influenced by regional and local factors, including the age and thickness of the deposit and the presence of minerals. The water-bearing characteristics of the aquifer are generally uniform (within most), but not in a few local areas.

Groundwater movement generally is toward the east and southeast, and is also affected by local topography and soil conditions.

The unconsolidated deposits contain a variety of minerals, including quartz, feldspar, mica, and clay. The composition of the deposits varies from place to place, depending on the age and thickness of the deposit.

AQUIFER AND WELL CHARACTERISTICS

Data on the unconsolidated aquifer are derived from hydraulic characteristics in different parts of the county. The results and their characteristics are described as follows:

1. Alluvium: Wells are confined to the Recent alluvial plains. Specific capacity range from 0.5 to 2.5 gpm per ft.
2. Unconsolidated deposits, Tertiary: Wells are confined to the Tertiary deposits. Specific capacity range from 0.5 to 2.5 gpm per ft.
3. Unconsolidated deposits, Quaternary: Wells are confined to the Quaternary deposits. Specific capacity range from 0.5 to 2.5 gpm per ft.
4. Shale deposits: Groundwater is unconfined and is subject to change from year to year.

Selection of Groundwater Production Wells

The selection of groundwater production wells is based on the following criteria:

1. Alluvium: Wells must be located in the Recent alluvial plains.
2. Unconsolidated deposits, Tertiary: Wells must be located in the Tertiary deposits.
3. Unconsolidated deposits, Quaternary: Wells must be located in the Quaternary deposits.
4. Shale deposits: Groundwater production wells must not be located in areas where the shale deposits are present.

CHRONICAL QUALITY OF GROUND WATER

Ground water in the unconsolidated aquifer ranges from the shallow freshwater type to the calcium magnesium sulfate type. The water, which has a hardness of more than 7 grains per gallon, shows a trend of increasing concentration of dissolved solids with depth and distance from the center of the city. The water is calcium magnesium sulfate type, with a calcium hardness of more than 7 grains per gallon.

GROWTH AND EFFECT OF DESTRUCTION

The population of the county has increased significantly in recent years, and the demand for water has increased accordingly. The growth of the population has led to an increase in the demand for water, and the demand for water is expected to continue to increase in the future.

SELECTING REFERENCES


Geology and groundwater resources of Harvey County. Kansas Geological Survey Bull. 43. 170 p.

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