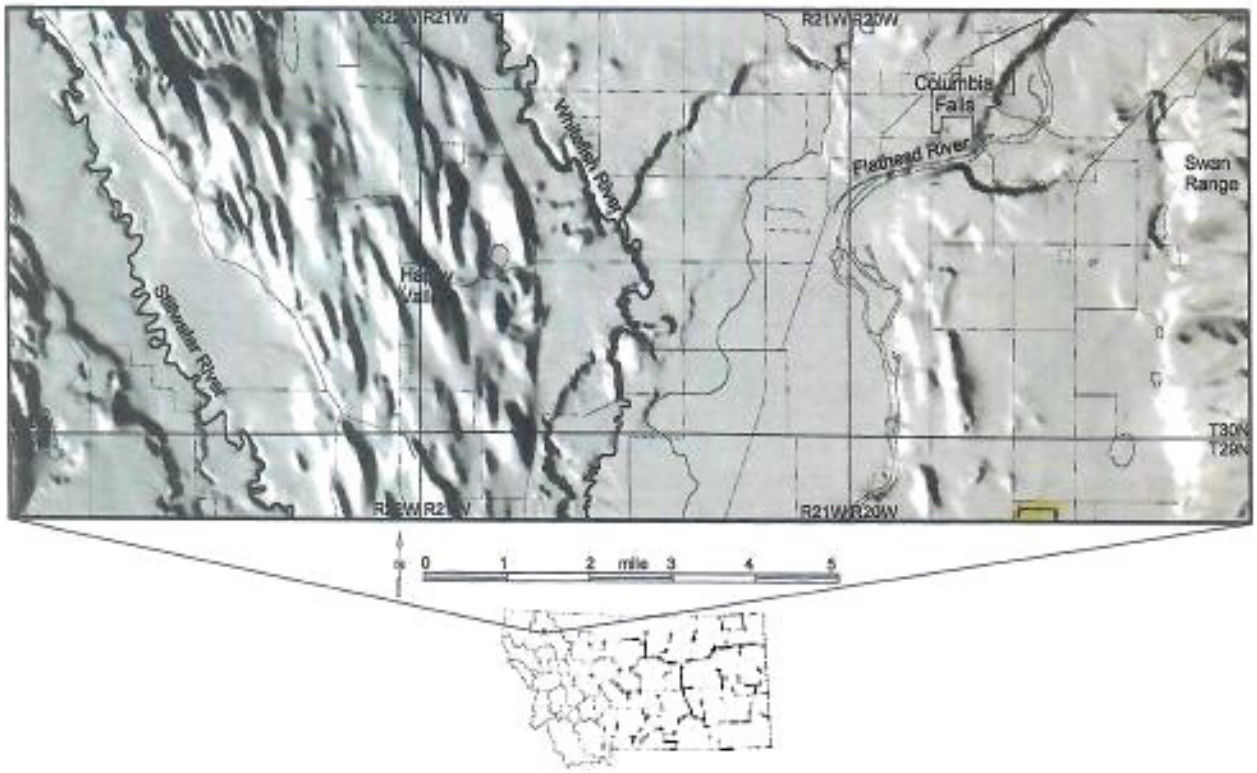
A Reconnaissance Groundwater Investigation in the Upper Flathead River Valley Area



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Montana Department of Natural Resources and Conservation

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ABSTRACT

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The Flathead Valley Groundwater Study provided a reconnaissance-level characterization of groundwater conditions across the upper Flathead River valley area from 1994 to 1997. The study area comprised a 1-mile wide, east-to-west transect extending from the base of the Swan Range about 2 miles south of Columbia Falls, westward to the foothills of the Salish Mountains. Groundwater conditions were characterized by drilling observation wells to describe the geology of the deep aquifer, and monitoring groundwater levels and quality.

Deep subsurface geology was delineated from lithologic descriptions of the installed project wells and other existing well logs along the transect. Surficial geology was examined and described by Smith (2000). Major depositional environments include: floodplain alluvium, glacial outwash, glacial till, and glacial lakebed deposits. The valley floodplain alluvium and glacial outwash constitute the shallow aquifer. The deep valley fill and bedrock beneath glacial till and glacial lakebed sediments comprise the deep aquifer. The glacial till and glacial lakebed deposits of varying thickness form a confining unit that overlies the deep aquifer.

Groundwater levels were monitored in transect wells from June 1994 through December 1997. Hydrographs showed a general rising trend in groundwater levels, that was attributed to above-average precipitation from 1995 through 1997. In addition to the groundwater-level rises, some wells displayed seasonal groundwater-level fluctuations in response to snowmelt, stream stage, and drawdown effects of pumping irrigation wells. Groundwater-level data indicate that groundwater flows from the bedrock of the nearby mountains and recharges the valley-fill aquifer.

Water quality of the deep aquifer was generally good for consumptive and irrigation uses. Concentrations of inorganic chemical constituents fell below maximum concentration limits established by the U.S. Environmental Protection Agency, except for iron and hardness, which exceeded recommended levels in some wells.