

Hydrogeology of the Farm Loop Road Area, Anchorage C-6 Quadrangle, Alaska

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The study area lies just north of Palmer, Alaska and is bounded by the Palmer-Fishhook Road to the south and west, Moose Creek and the Matanuska River to the east, and the foothills of the Talkeetna Mountains to the north. All utilized water is obtained from groundwater. Several single-family housing developments are present, but most of the land is used for agriculture. Loess mantles the topographically dominating Naptowne II glacial features in the area which consist of kame/esker complexes, outwash terraces, and ground moraine. Underlying Tertiary bedrock, exposed only along Moose Creek, consists of interlayered sandstone, shale, and coal.

Examination of 526 wells and geotechnical borings revealed water is being produced from four aquifers. The unconfined aquifer, aquifer A, consists of glaciofluvial sands and gravels mantled by loess. The underlying glacial till is the confining layer in the area and has been termed aquifer B, even though water is only produced from discontinuous sand layers with the main till mass. Aquifer C is a zone of sands and gravels underlying the glacial till, while aquifer D consists of the sandstone in the underlying Tertiary bedrock. Geostatistical spherical kriging techniques were used to produce unconfined water table and confined piezometric surfaces for the aquifers. Kriged surfaces with variograms having the least root mean square error were chosen to represent the actual surfaces. Regional groundwater flow is to the south and southeast for all aquifers. The flow directions for aquifer A delineate three watersheds, Spring Creek, Wasilla Creek, and Little Susitna River. Currently the B aquifer is the highest producing zone, followed by bedrock sandstone and then the C aquifer. The unconfined A aquifer is rarely used for water supply.