Beltsville Quadrangle, Prince Georges, Montgomery and Howard Counties, Maryland

By

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The map shows sample localities, mineral localities, drill holes, and selected outcrops and exposures. In addition, generalized contours on the bedrock surface provide a rough guide to thickness of overburden when used in conjunction with the topographic map. Overburden includes all of the unconsolidated deposits which can generally be moved by power equipment, comprising alluvium, colluvium, upland and terrace gravels, Coastal Plain strata, saprolite, artificial fill and man-made ground.

The contours on the bedrock surface portray, in a general way, the configuration of the saprolite-rock interface. This interface is essentially the contact between almost impermeable crystalline bedrock below (except for open fractures) and saprolite above; saprolite is a spongy, relatively permeable weathered material with porosities commonly exceeding 40 percent and excellent directional permeabilities. Thus the map may be useful as a general guide to predicting routes of subsurface fluid migration at the saprolite-rock interface. The bedrock "topography" is aligned parallel to the regional northeasterly foliation, and it is likely that routes of ground-water transmissivity would be strongly influenced by the preferred directional orientation of micas and clays in the saprolite formed on foliated mica schist and gneiss. Parallel and intersecting joint systems which fracture the bedrock into polygonal blocks would also influence rates and routes of subsurface migration, as shown by the devious routes depicted on the schematic diagram, Figure 1. Where the route of subsurface ground-water migration near the bedrock surface is intersected by a stream valley, springs, seepages and damp ground are common, and these are probable sites of recharge of surface streams by ground-water. Use of the bedrock surface contours in conjunction with the geologic map may contribute to prediction of probable routes of subsurface effluent migration from septic tank fields, leachate from sanitary landfills and outfall from sewage disposal plants or sludge pits.

Nevertheless, not enough is currently known to enable accurate predictions about the physico-chemical nature and hydrologic properties of the saprolite and soil produced from different rock types in different physiographic settings, the efficiency of saprolite as a filter, the nature of ion exchanges with different clays, the changes in clay mineralogy which may occur with time and with changing effluent chemistry, or the area and volume of material needed to purify leachate or surface disposal fluids.

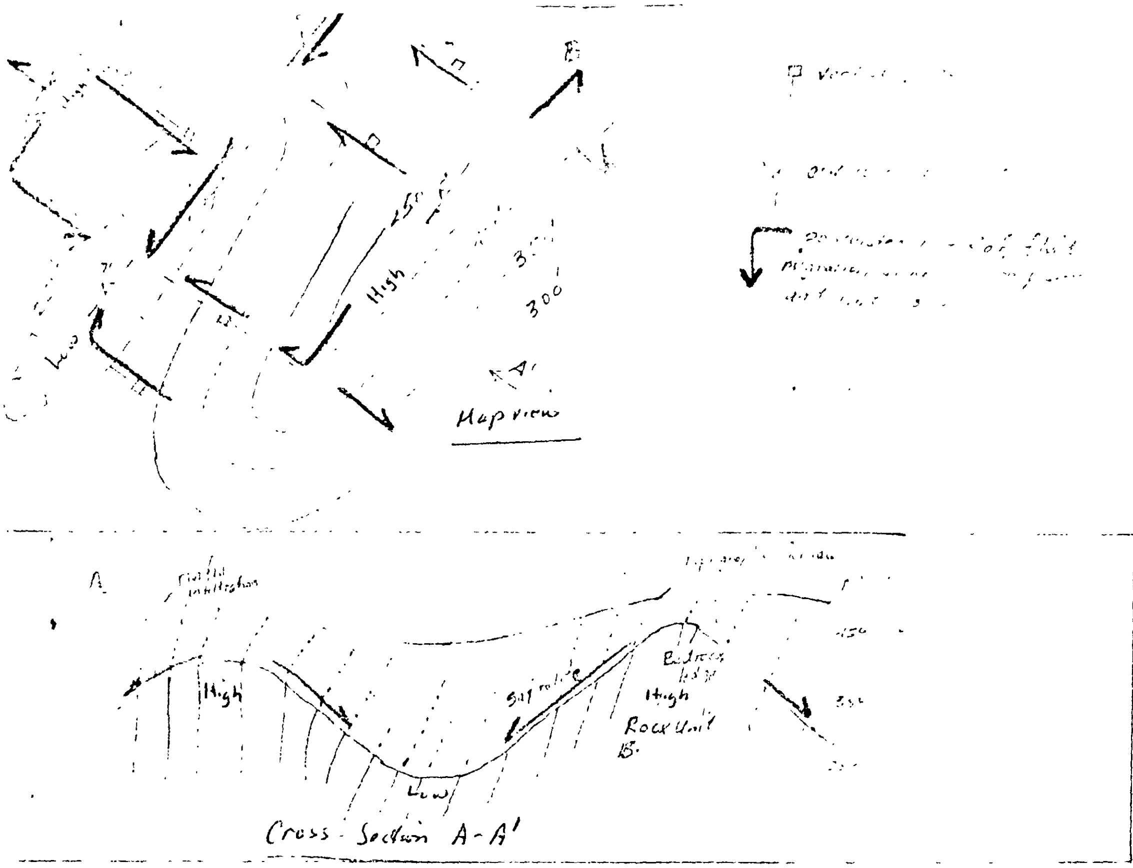

Fig. 1 Postulated routes of ground-water percolation and migration at saprolite/fresh mica schist (B) bedrock interface along foliation planes and joints. This schematic representation reflects influence of bedrock topography and structure in a lithologically homogeneous system with ground water recharge by rainfall infiltrating through saprolite.