

CONTOUR MAP OF THE BASE OF SAPROLITE, VIENNA QUADRANGLE,
VIRGINIA AND MARYLAND

by

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The map showing the base of the saprolite which overlies fresh crystalline rock portrays, by means of continuous contours, a generalized configuration of the Saprolite-hard rock interface. This interface is usually gradational and irregular; it is the contact zone or surface between almost impermeable bedrock below (except for fractures) and porous, relatively permeable, weathered material. Most outcrops and drill holes (mainly water wells) used as elevation control points are shown; however, the locations of many drill holes were not verified, and thus should be considered only as approximations. Use of a contour interval of 20 feet locally may exceed the limits of subsurface and surface control and implies an accuracy not inherent in the available data. Local variations greater than the contour interval are possible; thus the map should not be used for detailed site evaluation, which requires additional drill hole or geophysical surveys. Dashed contours are projected in areas where the saprolite is missing, as in alluvial valleys underlain by unweathered bedrock or in upland areas where hard fresh bedrock occurs at the surface, and the base of saprolite horizon is therefore absent. As shown on the cross-section, the base of saprolite generally parallels the topographic surface.

Comparing this map with the Thickness of Overburden Map (Neuschel and Froelich, 1975) and a bedrock map it is apparent that many of the bedrock "highs" are coincident with areas of thin saprolite on quartz bodies, mafic and ultramafic rocks, and the relatively low areas are formed on schist, gneiss, or granite overlain by thick saprolite.

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The trend of the contours is usually parallel to the regional planes of splitting, and it seems likely that routes and rates of fluid migration would be influenced by the orientation and inclination of ubiquitous micas and clays in the saprolite mantle. Parallel and intersecting joint systems would also strongly influence fluid migration.

Despite excellent studies by Nutter and Otton (1969), Otton (1972) and Stewart (1962, 1964), not enough is currently known to enable accurate predictions about the physiochemical nature, filtration, transmissivity and hydrologic properties of the saprolite and soil produced from different rock types in different physiographic settings, and additional work is needed to evaluate these factors.

Possible Uses of the Map: The Base of Saprolite Map can be used to show the subsurface bedrock configuration for preliminary evaluation of proposed excavation or tunneling corridors. Use of this map in conjunction with a bedrock map may contribute to prediction of routes of subsurface fluid migration, not only of ground-water, but of effluent from septic tank fields, leachate from sanitary landfills, sewage disposal plants, or sludge pits. Used in conjunction with the topographic map, base of saprolite contours may suggest avenues where ground-water may emerge to mingle with surface streams or where storm water runoff may enter the saprolite. Relatively low areas on the bedrock surface which are overlain by a thick mantle of porous saprolite have large storage capacities; they may be favorable sites for developing ground-water supplies from wells in bedrock fractures (Ced^erstrom, 1972).

EXPLANATION

Data Control Point

240 X Bedrock outcrop, unweathered; at saprolite interface; with approximate elevation in feet. Not all outcrops shown.

X Bedrock outcrop, unweathered; no saprolite present.

180 o Drill hole, approximately located; with approximate elevation of unweathered bedrock in feet, estimated from drillers' logs or inferred from depth of casing in water wells. Queried where depth inferred. Not all wells shown.

<170 o Drill hole, approximately located; unweathered bedrock not penetrated but known to be less than indicated elevation in feet.

185 o Spring, with approximate elevation in feet.



Generalized contours on base of saprolite, contour interval 20 feet. Hachures indicate possible basins. Contours projected and dashed where saprolite-bedrock interface is absent.



Virginia (Vienna quad.) Surficial : 1:24,000. 1975
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