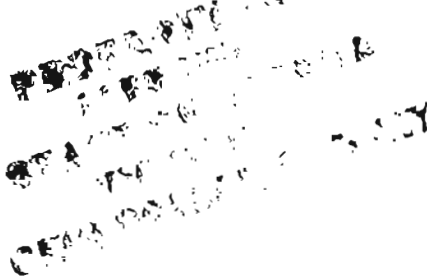


U.S. DEPARTMENT OF THE INTERIOR

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Uraniferous Phosphate Occurrence on
Kupreanof Island, southeast Alaska

by

Kendell A. Dickinson

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This report is preliminary and has not
been edited or reviewed for conformity
with U.S. Geological Survey standards
and nomenclature

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An occurrence of uraniferous phosphate was found near Big John Bay and Hamilton Creek on Kupreanof Island in southeastern Alaska. Three samples were collected from a road-metal pit located near the center of the south half of sec. 6, T. 58 S., R. 75 E., in the Petersburg D-5 quadrangle. Although the area is unmapped, the samples were collected from a carbonate that appears to be a facies of the Permian Cannery Formation (Muffler, 1966).

The dominant rock type at the pit is gray limestone with white calcite veins. The samples consist of fine-grained light to dark gray silty laminated apatitic dolomite that contains white calcite veins and quartz. Fragments of laminated phosphatic rock are suspended in white calcite. According to J. Cathgart (written commun., 1979) "The apatite mineral, judging from the X-ray diffractograms is a rather typical carbonate fluorapatite--the mineral of all marine phosphate deposits. In this mineral there is only slight substitution of CO_3 for PO_4 in the apatite structure. I would guess, that from this limited evidence that the apatite mineral is very close in its composition and substitutions to the apatite mineral of the Phosphoria Formation, and is quite different, for example, from the apatite mineral of the Florida and North Carolina deposits." Judging from X-ray peak heights on diffractograms, the samples contain about 30-50 percent apatite. A beta eU measurement from one sample indicated 80 ± 24 ppm uranium. The uranium is apparently contained in the apatite. In the three samples studied, a direct relation exists between the height of the X-ray diffractogram peaks of apatite and the alpha-count of the X-ray sample. In addition to apatite, the samples contain dolomite, calcite, and quartz.

The bed from which the samples were taken is poorly exposed, but judging from the dimensions of the radioactive anomaly, which reached a maximum of about 20 times background, it is no more than a half meter in thickness. Its lateral extent was not determined. No aerial radiometric anomaly was recorded along a flight path that passed over similar rocks about 6 km north of the occurrence. Also, no anomaly was found over dissimilar rocks where a flight line passed 4 km south of the occurrence (LKB Resources, Inc., 1979a, 1979b).

This report is based on a very brief field visit and it does not establish the existence of commercial size phosphate deposits in the area. It suggests, however, that further work could prove fruitful. The only other known occurrence of phosphate rocks in Alaska is in Mississippian and Triassic rocks along the northern margin of the Brooks Range (Patton and Matzko, 1959).

References cited

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- Muffler, L. J., 1966, Stratigraphy of the Keku Islets and neighboring parts of Kuiu and Kupreanof Islands, southeastern Alaska U.S. Geological Survey Bulletin 1241-C, 52 p.
- Patton, W. W., Jr., and Matzko, J. J., 1959, Phosphate deposits in northern Alaska: U.S. Geological Survey Professional Paper 302-A, 17 p.