Current Intelligence Bulletin 10

May 11, 1976

RADON DAUGHTERS

May 11, 1976

It has recently come to the attention of the National Institute for Occupational Safety and Health (NIOSH) that measurements of the radioactive decay product "daughter" concentrations of radon gas in a number of National Park Service caves are near the occupational limits as set forth in Occupational Safety and Health Administration's (OSHA) standards for uranium miners. National Park Service caves in which one or more samples greater than 0.30 working levels (WL) were found include Carlsbad Caverns National Park, New Mexico; Lehman Caves National Monument, Nevada; Mammoth Cave National Park, Kentucky; Oregon Caves National Monument, Oregon; and Round Spring Cave in Ozark National Scenic Riverways, Missouri. In addition to the radiation levels inside the caves, buildings above the ground at Mammoth Cave, cooled with cave air, had 0.6 WL alpha radiation. Studies of uranium miners have shown that the alpha radiation emitted by the radon "daughters" caused an increase in pulmonary malignancies which became evident ten or more years after individuals first started mining.

The OSHA requirements for uranium mines and deemed by Environmental Protection Agency (EPA) applicable to natural caves are as follows:

- Above 0.1 WL alpha radiation -- all underground smoking stopped

- 0.1 to 0.2 WL -- monitor workspace at least once yearly

- 0.2 to 0.3 WL -- monitor workspace quarterly

- Above 0.3 WL -- monitor workspace weekly and maintain exposure records on all exposed employees

- 1.0 to 2.0 WL -- immediate corrective action to lower the concentration below 1.0 WL

- Above 2.0 WL -- withdraw all workers not necessary to lower the concentrations below 1.0 WL

- Cumulative individual exposure shall not exceed 4 working level months in any calendar year

EPA states that the individual exposure limit of 4 WL months per year recommended by OSHA cannot be characterized as safe since the risk of lung cancer would be expected to double after 10 to 20 years employment. Therefore, it might be advisable to rotate long-term employees working in high radiation areas.

NIOSH supports the above recommendations, and is taking this opportunity to advise State Radiological Health officials of the potential hazards for privately owned caves and "cave air" conditioned buildings. Because there are a number of state and privately owned caves throughout the United States, NIOSH would also recommend the radiation levels in these caves be assessed.

Sincerely yours,

Edward J. Baier
Deputy Director

NIOSH

Current Intelligence Bulletin

Reprints-Bulletins 1thru18 (1975-1977)

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Center for Disease Control
National Institute for Occupational Safety and Health