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RADIOACTIVE OILFIELDS: COLD WAR URANIUM EXPLORATION IN AREAS OF HYDROCARBON DEPOSITS

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Early 20th century radiation studies related to hydrocarbon deposits were part of the fundamental research on natural materials' radioactivity. U.S. oil company research in the 1930s considered the potential usefulness of radioactive anomalies in hydrocarbon exploration. Development and early usage of the gamma ray (GR) log in the late 1930s and 1940s continued to document anomalous oilfield signatures. With the beginnings of the atomic age (1945), the U. S. Atomic Energy Commission (1946), and the Cold War (1947), there was a strategic need to develop domestic uranium supplies. The United States Geological Survey (USGS) was the main federal agency to assist the AEC in this mission. The oil industry was considered the most knowledgeable about sedimentary-rock-related radioactivity. In 1948, the USGS began a 10,000-GR-well-log review from the major oil company files to identify sedimentary deposits which might contain radioactive minerals. Oilfield study began that same year and included the mid-continent of Kansas and Oklahoma and the Texas gulf coast. Besides log examination, samples of cuttings, oilfield pit sludge, precipitated scale and formation water were also analyzed. The AEC formally requested the assistance of the petroleum industry and began a series of meetings with oil industry executives in 1951. Phillip Merritt of the AEC presented a talk in St. Louis at the 1951 American Association of Petroleum Geologists (AAPG) annual meeting entitled "Uranium and the Petroleum Industry." A program for agency/oil company cooperation was initiated which included data sharing and the AAPG's 1952-56 Advisory Committee on Radioactive Mineral Exploration. The USGS incorporated laboratory safety procedures in 1951 and focused upon dust control during sample preparation of the relatively low-radioactivity samples. In 1952, radon analysis of helium-bearing natural gas of the Panhandle Field indicated that several hundred producing gas wells contained radon 10 times higher than the 1941-established maximum permissible concentration of radon in air. When the oil company operator was informed, the company initially refused permission to release the specific data for fear of lawsuits. However, the USGS suggested comparison to radon safety standards of mining operations where the Public Health

Service permissible worker radon standards were higher than the gas well radon measurements. Analytical data indicated that most oilfield-related radioactivity was associated with radium, not uranium. By 1954, radioactive precipitates were documented in eight Texas and two Louisiana gulf coast salt dome oilfields, but uranium deposits were not found. Oilfield-specific uranium research slowed down after the 1950s, but renewed interest in Louisiana salt domes in 1969-71 resulted in regional study but no successful uranium discoveries.