EVENING MEETING—JANUARY 9, 1978

WILLIAM E. GALLOWAY—Biographical Sketch

Dr. Galloway is a native Texan, being born in Waco and receiving his geological training at Texas A&M and The University of Texas. He was awarded a B.S. with High Honors from A&M, where he was an NSF research participant during his Junior year. His M.A. and Ph.D. in Geology were granted by The University of Texas at Austin, where he was an NSF Fellow. During his schooling, he held summer jobs with Mobil and with the Bureau of Economic Geology. In 1970 he joined Continental Oil Company at Ponca City, where he rose from Research Scientist to Director of Geological Research in the Exploration Research Division before joining the Bureau of Economic Geology at Austin as a Research Scientist.

Dr. Galloway's research interests include the stratigraphy and geologic setting of uranium and sedimentary copper deposits; the effects of depositional environment and diagenesis on reservoir parameters; stratigraphic analysis of seismic gravity and computer-compiled subsurface data; and seismic modeling techniques. He is a member of Tau Beta Pi, Sigma Gamma Epsilon, and Phi Eta Sigma honorary societies. He received the A. I. Levorsen Award from the Rocky Mountain Section-AAPG (April 1977) for the paper to be given to HGS.

RELATIONSHIPS BETWEEN DEPOSITIONAL SYSTEM; GROUND-WATER FLOW HISTORY; AND ORIGIN, MIGRATION, AND CONCENTRATION OF URANIUM—CATAHOULA FORMATION OF TEXAS COASTAL PLAIN[1] (Abstract)

by William E. Galloway

The Catahoula Formation is a host for major known reserves of uranium ore and is the target of extensive exploration in the Texas coastal plain. Regional genetic facies analysis shows the Catahoula to consist of two principal fluvial systems. The Gueydan fluvial system of South Texas consists of low sinuosity, bed-load to mixed-load channel sands, and gravelly sands interbedded with ash-rich crevasse and floodplain facies. Coarse material was derived from erosion of volcanic debris in Trans-Pecos Texas; ash was derived from explosive eruptive centers in western Mexico. The Chita-Corrigan fluvial system of East Texas contains deposits of several sinuous to meandering, mixed-load channel complexes surrounded by extensive crevasse-splay, floodplain, and lacustrine facies. Sands were derived from nonvolcanic sources, but air-fall ash is abundant.

Analysis of trace uranium content of ash-derived mudstones indicates early mobilization of uranium in depositional environments characterized by subaerial leaching and soil formation. Solubilized uranium entered a well-integrated, semiconfined ground-water flow system in areas of ground-water recharge, and moved coastward down the regional hydrodynamic gradient. Primary controls on the geometry of ground-water flow and total flux through a particular area include (1) the aggregate permeability, degree of interconnection, and orientation of aquifer sands (determined by the depositional system); (2) the distribution of syndepositional fault zones (which affect both facies distribution and later ground-water flow geometry); and (3) the geographic position of recharge and discharge areas. The areal extent, geometry, and uranium content of alteration fronts, in turn, reflect the geometry and flux of the ground-water flow system at the time of mineralization. Postmineralization diagenetic alteration of host sands and the geological relationships suggest that Catahoula mineralization patterns were established soon after deposition in a semiconfined aquifer; subsequent remobilization and migration of uranium have been limited.

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