SURFACE EXPLORATION IN MATURE BASINS: ADVANCES OF THE EIGHTIES, APPLICATIONS FOR THE NINETIES

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ABSTRACT

Few question the fact that the surface indications of oil and gas seepage have led to the discovery of many important oil-producing areas. Less clear, however, is the precise relationship between a hydrocarbon-induced anomaly at the surface and a subsurface petroleum accumulation. The surface manifestation of hydrocarbon seepage can take many forms, including anomalous hydrocarbon concentration in sediments, microbial and botanical anomalies, mineralogic changes, and altered magnetic and electrical properties. These varied expressions of hydrocarbon seepage have led to the development and marketing of an equally diverse number of surface prospecting techniques. Each has its proponents; each claims success; and all compete for the explorationist's attention and dollars. Is it any wonder explorationists are confused, or at least skeptical?

Recent technological advances in geochemical and non-seismic surface methods have demonstrated the validity of many of these methods. More importantly, a number of these methods show considerable promise for the early delineation of the productive limits of a field or recent discovery. As the emphasis of the domestic exploration industry shifts increasingly from frontier basins to mature basins, and from exploration to development, new opportunities will be created for the use of these cost-effective surface exploration methods. These applications will be not only to high-grade leads and prospects, but to help guide the development program as well. Proper integration of surface and subsurface methods has the potential to significantly reduce exploration and development costs, while improving success rates and shortening development time.

PERMIAN BASIN OIL AND GAS FIELDS: INNOVATIVE IDEAS IN EXPLORATION AND DEVELOPMENT