

**AAPG Annual Convention  
Salt Lake City, Utah  
May 11-14, 2003**

Ronald R. McDowell<sup>1</sup>, Khashayar Aminian<sup>2</sup>, Katharine L. Avary<sup>1</sup>, Michael Ed. Hohn<sup>1</sup>, David L. Matchen<sup>1</sup>, Benjamin H. Thomas<sup>2</sup> (1) West Virginia Geological and Economic Survey, Morgantown, WV  
(2) West Virginia University - Petroleum and Natural Gas Engineering, Morgantown, WV

### **Drill Core Helps Breathe New Life into Appalachian Basin Oil Fields**

Drill core provides a unique insight into petroleum reservoirs. In the Appalachian Basin, acquisition of new core is a rare event. For the past decade, geologists from the West Virginia Geological Survey and petroleum engineers from the West Virginia University have studied several Devonian and Mississippian oil fields discovered in the late 1800's. Reservoir characterization in an old oil field resembles an archaeological dig - data are poorly preserved, fragmentary, and buried in forgotten places. Our first task is to assess available data and to retrieve anything that has survived events such as office fires and company buyouts. Paper records may have disappeared but core is sometimes found languishing in storage sheds. Drill core is relatively indestructible, bulky, and requires a conscious effort to discard. In times of lean budgets, benign neglect works to preserve core - it may be simply too time consuming and expensive to dispose of it.

Examination of core allows the geologist to view stratigraphic units most commonly identified from geophysical logs; provides insight into the composition of units; and allows "calibration" between log and core. We use geophysical logs and parameters measured from core to establish and characterize electrofacies. Because they represent reservoir flow units and can be modeled geostatistically, electrofacies are a key element in our reservoir studies. Electrofacies are a primary input to engineering predictive tools such as numerical simulators or neural networks. The latter technique, using data taken directly from core, shows great promise in predicting reservoir production performance during secondary recovery waterflood operations.