

# **CHARACTERIZING RESERVOIR QUALITY AND EXTENT OF MARCELLUS MUDROCKS THROUGH A COMPARISON OF CHEMOSTRATIGRAPHIC CHARACTER AND PETROPHYSICAL RESPONSE**

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## **ABSTRACT**

This study combines robust geochemical data with core descriptions and wireline log responses to gain new insight into the paleoceanographic conditions during Marcellus deposition and the resulting quality and distribution of reservoir facies. Three cores penetrating the Marcellus Formation in North-Central Pennsylvania were described and samples were taken at two-foot intervals. The geochemistry of the 502 samples was characterized and used to identify chemofacies. Lithofacies descriptions and chemofacies characterization indicate the production and preservation of TOC-enriched intervals occurred during periods of euxinia/anoxia coupled with high production. GR log response in the Marcellus Formation is principally controlled by uranium and the relationship of uranium to organic matter allows for the creation of synthetic TOC logs from GR logs and the prediction of TOC. Subsurface correlation indicates relative thinning of chemofacies to the northwest and a general increase of net organic enrichment thicknesses to the northeast of our study area.

AAPG Search and Discovery Article #90298 © 2017 AAPG Foundation 2016 Grants-in-Aid Projects