# CONTROLS ON COAL QUALITY IN COASTAL ENVIRONMENTS: EXAMPLE OF THE DANVILLE COAL IN THE ILLINOIS BASIN, CENTRAL USA

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The Danville Coal Member (upper Desmoinesian, Pennsylvanian) is a significant economic coal resource in the Illinois Basin, central USA. Deposition of the Danville coal (peat) took place in coastal environments, with varying distance form the coastline and, therefore, variable influences of saline waters both contemporaneously and post-depositionally. The purpose of this study is to examine the coal quality and petrography of the Danville coal and relate that to the depositional environment and, in turn, to discuss the significance of these relationships to the final coal product. An area of medium sulfur (1.0 to 1.5%) Danville coal (Vigo County, IN) was compared to an area of low (1.0%) sulfur Danville coal (Knox County, IN). The medium sulfur coal resulted from the peat being deposited in a near-marine environment in contact with saline waters, whereas the low sulfur coal resulted from deposition further inland where the peat was protected from the influence of saline waters by thick deposits of non-marine fine-grained clastics. Within both areas the coal quality, coal composition, and trace element contents also vary as a function of the proximity of the coal to an overlying permeable marine sandstone aquifer as well as mine-scale seam elevation changes. Where the marine sandstone overlies the coal, the sulfur content is higher in the top third of the seam. Conversely, where there is a thick section (10 ft) of fine clastic sediments atop the Danville; the sulfur and trace elements are significantly lower.