from decreasing flow regime. This sequence of bedding, together with the vertical decrease in grain size observed, is typical of a fluvial sandstone. Sandstones (quartzarenite) are characterized by a high quartz content (85 to 98%), moderate matrix (5 to 10%), and a small amount of minor constiuents (muscovite and calcite).

Electric log cross sections reveal lateral variation in sandstone thicknesses. Sand bodies are lenticular and discontinuous, characteristic of intermittant braided stream deposition. Reservoir sandstones have porosities ranging from 12 to 22% and permeabilities of up to 500 md. Recognition of the vertical sequence of primary rock properties is indicative of braided stream deposits, and the associated electric log characteristics may aid in future exploration and production efforts for similar reservoirs.

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Geomorphic Controls on Course of Juniata River in Valley and Ridge Province, Pennsylvania

Structural and lithologic factors affect stream-flow patterns of the Juniata River, a cross-axial superimposed consequent stream, in the Valley and Ridge province of Pennsylvania. From an examination of the influence of folding, faulting, and jointing upon the course of this stream and its major tributaries through a succession of points and reaches, the various means have been identified by which its course is determined across both weak and resistant rock deformed into a variety of geometric attitudes. Jointing, thrust faulting, normal and reverse faulting, superimposition, subsequent stream development, and monoclinal shifting in the classic sense of Gilbert are the geomorphic controls. No one control is dominant, all being effective, owing to the complexity of the jointing, folding, and faulting of the region. Monoclinal shifting will probably dominate as the principal geomorphic control in the geologic future.

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Flocculation Reduces Cation Exchange Capacity of Suspended Estuarine Sediment

The variation in the cation exchange capacity (CEC) of suspended sediment entering the Delaware Bay was determined as a function of salinity. Cation exchange capacity is based on Ca, Mg, Na, and K, the four commonest exchangeable ions. A comparison of the CEC (units in meq/100 g) of suspended sediment with salinity shows a sharp initial decrease from 73 meq/100 g at 0% salinity to a minimum value of 29 meq/100 g at 2.44% salinity, then a gradual rise to 48 meq/100g at 15.03% salinity. The observed trends between CEC and salinity were correlated with sampling conditions (depth, temperature, pH), mineralogy, iron III hydroxide and organic coatings, and the degree of particle flocculation. A very good ($> .90$) linear correlation exists between the degree of flocculation, expressed as the proportion of primary (individual, $< 2\mu$) particles, and the CEC's of the overall suspended sediment. The other variables do not show any significant correlation with the CEC-salinity trend. It is evident, therefore, that the process of flocculation leads to a decrease in CEC values. It is speculated that the process of flocculation is a function of the ionic strength of the water. The attraction or repulsion of suspended particles is a surface-charge phenomenon which is controlled by the ionic strength of the water.

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Transmission Survey Using Seismic Guided Waves: Cadiz, Ohio

When seismic survey energy is initiated within a coal seam, internally reflected S and P waves constructively interfere to form a seam wave. The seam wave is a high-frequency, dispersive wave which may exhibit both Rayleigh-type and Love-type modes. Since the seam wave is confined to the coal seam, its frequency content and dispersion characteristics are a function of the elastic properties and thickness of the coal seam. Large variations in the elastic properties or thickness of the coal seam, such as faults, sand bodies and pinch-outs, will affect the frequency and dispersion of the seam wave.

Seam-wave studies applied to coals in the eastern United States are few. The paper gives an acount of a transmission survey shot across a block of coal in the Oak Park Mine located near Cadiz, Ohio. The coal seam, under investigation is the lower Freeport (6A) which is 54 in. (14 cm) thick at the Oak Park Mine. Conducting an underground seismic survey presents many difficulties including: (1) mine accessibility; (2) underground-safety regulations; (3) source and receiver coupling; and (4) maneuverability. Comparison of the observed dispersion and predicted dispersion of the seam wave reveals its dominant mode and frequency content.

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Geochemical Controls on Aquia Aquifer in Maryland and Model for a Major Cation Source

The Aquia Formation is a Paleocene-Eocene glauconitic marine sand. It forms part of the Pamunkey Group of the Atlantic coastal plain. The geochemistry of the water in the Aquia aquifer, as shown by computer analysis, is controlled by the hydrologic flow regime and the mineralogy of the sediments. The ionic exchange of Na for Ca in glauconite and the dissolution of the sedimentary minerals are believed to be major sources of the cations in the aquifer waters. A model equation for the dissolution of glauconite has been developed and found to be thermodynamically feasible. The value for Gibbs free energy of formation for glauconite was estimated by a known method for layered silicates and found to be -1425 Kcal/mol. This produced a log Kiap/Keq ratio of -197 and shows glauconite undersaturated with respect to the formation water.

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Coal Geology of Lower Youghiogheny Basin, Garrett County, Maryland

The Lower Youghiogheny basin (130 sq mi or 338 sq km) ranks fourth in total area of the five synclinal coal basins of western Maryland. Approximately 1,000 ft (305 m) of coal-bearing strata of Early to Late Pennsylvanian is exposed (Pottsville, Allegheny, and Conemaugh Formations). The Pottsville Formation rests unconformably on the Mauch Chunk Formation of Late Mississippian. The contact separating the Pottsville and Allegheny Formations is the top of the Homewood Sandstone, and that separating the Allegheny and Conemaugh Formations is the top of the Upper Freeport coal bed. A coal bed correlated with the Little Clarksburg, which occurs in the upper third of the Conemaugh Formation in West Virginia, is