PMLP-50615

01394106 GEOREF NO.: 86-60882
TITLE: Cadmium and manganese sorption on soil macropore material
AUTHOR(S): Steele, Kenneth F.; Turner, Ralph R.
CORPORATE SOURCE: Univ. Arkansas, Dep. Geol., Fayetteville, AR, United States
CORPORATE SOURCE: ; Oak Ridge Natl. Lab., United States
MONOGRAPH TITLE: The Geological Society of America, Southeastern Section, 35th annual meeting; South-Central Section, 20th annual meeting
CONFERENCE TITLE: The Geological Society of America, Southeastern Section, 35th annual meeting; South-Central Section, 20th annual meeting
CONFERENCE LOCATION: Memphis, TN, United States,
CONFERENCE DATE: Apr. 2-4, 1986
PUBLISHER: Geological Society of America (GSA), Boulder, CO, United States
SOURCE: Abstracts with Programs - Geological Society of America vol. 18 no. 3; p. 266
DATE: 198602
COUNTRY OF PUBLICATION: United States
CODEN: GAAPBC ISSN: 0016-7592
DOCUMENT TYPE: Abstract; Serial; Conference document
BIBLIOGRAPHIC LEVEL: Analytic
LANGUAGE: English
DESCRIPTORS: cadmium; Fullerton cherty silt loam; geochemistry; macropores; manganese; metals; Oak Ridge Reservation; pollutants; processes; Shelocta silt loam; soils; sorption; surveys; Tennessee; United States
SECTION HEADINGS: 25 (Soils); 02C (Geochemistry of rocks, soils, and sediments);
GEOREF UPDATE: 1986

TECTONICS AND SEISMICITY IN THE BOWMAN SEISMOGENIC ZONE

№ 89818

SMITH, William A., TALWANI, Pradeep, COLQUHOUN, D.J., Department of Geology, University of South Carolina, Columbia, S.C. 29208.

The Bowman seismogenic zone, located in the Coastal Plain of S.C. northwest of Charleston, is situated on the complexly faulted northern flank of an east/west trending buried Triassic basin. In order to delineate and better define the structural elements and the relationship to seismicity on the border of this Triassic basin an integrated study utilizing a detailed gravity survey, seismic refraction survey, shallow stratigraphic and geomorphological studies, and current seismicity was undertaken. An analysis of the detailed gravity survey with station spacing less than one per square km reveals several NW and NE trending shallow basement faults, the intersection at which there is recurrent low levels of seismicity. These features are also suggested on the available aeromagnetic map. Six refraction lines were run in order to determine a velocity model. These reveal a complex structural/tectonic configuration. Shallow stratigraphic data and geomorphological patterns, such as linear river and drainage systems, suggest that they are manifests of NW and NE oriented tectonic elements in agreement with those inferred from the gravity and magnetic data. The initial interpretation of the seismogenic zone suggests an area of small scale NW and NE intersecting basement horst and graben systems. The site of seismicity appears to be located on the edges of blocks defined by these intersecting systems.

GEOLOGY OF THE BUENA VISTA 7.5 QUADRANGLE, VIRGINIA

№ 90746

SPENCER, Edgar W.; BOWRING, Christopher; WATERBURY, Matthew, Geology Department, Washington and Lee University, Lexington, VA 24450

The Buena Vista Quadrangle is located on the northwestern flank of the Blue Ridge in central western Virginia. Granulite gneisses of the Blue Ridge basement complex and the Catoctin, Unicoi, Harpers, Erwin, Shady, and Rome formations are exposed.

The major structural features of the area are conveninently separated into a number of northeast trending subdivisions. The western division consists of basement complex, Unicoi, Harpers, Erwin, Shady, and Rome. The more competent members of this division generally exhibit a 30 - 40° northwesterly dip. The less competent members (Harpers, Shady, and Rome) exhibit disharmonic folding and intraformational faulting. The basement is thrust over Unicoi (inverted in places) in this division.

The second division is composed of complexly folded and faulted Chilhowee, Catoctin and basement rocks. Although the eastern side of the main fault in this section is down relative to the basement, the southeast dipping thrusts and mesoscopic features indicate southeast to northwest tectonic transport. In the southeastern corner of this map area, the Rockfish Valley Fault carries basement onto lower Chilhowee and Catoctin.

GEOLOGICAL ANALYSIS, TO CONTRIBUTE TO AN "ORDINARY HIGH WATER LINE" DETERMINATION ON SELECTED FLORIDA LAKES

№ 98509

SPENCER, Steven, CAMPBELL, Kenneth, and SCHMIDT, Walter Florida Geological Survey, 903 W. Tennessee St., Tallahassee, FL 32304-7795

In recent years the State of Florida has needed to establish a line (elevation) around the shores of selected fresh water lakes differentiating the riparian upland ownership from the sovereign lake bottom (owned by the public). Geological analysis is one of several scientific disciplines utilized from which a final elevation is obtained. The geologic data represents information from the lake basin which has generally accumulated in response to long term, repetitive lake level fluctuations.

Geomorphic evidence such as scarps, terraces, and berm elevations are correlated. Lithologic sediment analysis may reveal granulometric trends, heavy mineral accumulations, organic layers, or clean beach sands. Sedimentary structure can be observed in transect trenches dug normal to the current shoreline. Soil geochemistry and microfossil content are also used to identify the transition zone between the upland, oxidized sediments, and the lake dominated, commonly reduced, organic rich sediments.

LATE DEVONIAN-EARLY MISSISSIPPIAN PHOSPHORITE-BEARING SHALES, ARBUCKLE MOUNTAIN REGION, OKLAHOMA.

№ 89704

SPESSHARDT, Scott A., and BARRICK, James E., Department of Geosciences, Texas Tech University, Lubbock, TX 79409.

Variations in phosphorite development across the Arbuckle Mountain region of southern Oklahoma reflect hydrographic and topographic conditions during late Famennian-early Kinderhookian time. Formation of marine apatite was controlled by upwelling circulation and concurrent development of a prolific pelagic biota. Release of phosphorous occurred as organic matter decayed near the boundary of the oxygen minimum layer, and phosphate subsequently accumulated below the sediment/water interface.

In the central Arbuckle Mountain region, phosphorites formed at shallow bathyal depths and occur as discrete spheroidal to lenticular nodules in black siliceous shales and cherts of the Woodford Shale. X-ray diffraction analysis reveals no phosphate within the sediments except that within the nodules. Nodules formed as a result of physicochemical mobilization of syndepositional phosphate by differential compaction. Various stages of fluorapatite crystal development occurred as a result of phosphate mobilization.

On the Lawrence Uplift, 35 miles to the northeast, phosphorites accumulated on a current agitated platform and occur as irregular laminae interbedded with dark clay shales and black siliceous shales of the Woodford. Phosphate formed as discrete, sand-sized collaphonous micronodules. Most micronodules lack internal structure, although some are concentrically laminated and others resemble grapestones. Reworking of phosphate by winnowing currents concentrated the micronodules into packstone laminae, and ultimately into irregular nodules. Discrete nodules accumulated in the overlying green shales of the pre-Welden horizon due to reworking of packstone laminae.

CADMIUM AND MANGANESE SORPTION ON SOIL MACROPORE MATERIAL

№ 91065

STEELE, K.F., Department of Geology, University of Arkansas, Fayetteville, AR 72701; TURNER, Ralph R., Environmental Science Division, Oak Ridge National Laboratory, Oak Ridge, TN 37830

There is a growing recognition that movement of contaminants through preferred channels, or macropores, in field soils may bypass much of the soil matrix and lead to faster contaminant transport to groundwater and streams than predicted from whole soil properties. Therefore, bulk soil and macropore materials were collected from two contrasting soil sites (Fullerton cherty silt loam and Shelocta silt loam) on the Oak Ridge Reservation, TN in order to compare the sorptivity of these materials for Cd and Mn. Sorptivity was determined as single point batch distribution coefficients using radiotracers.

The results of this study indicate that organic-rich root channel macropores exhibit higher distribution coefficients (580 and 160, respectively for Shelocta materials under ambient conditions) than for bulk soil (38 and 36, respectively for Shelocta materials under ambient conditions). Due to the higher density of pH dependent sorption sites on organic matter, sorption on root-derived macropore materials increases more rapidly as pH increases than does sorption on inorganic macropore materials. Inorganic linings and fillings along rock/soil contacts or soil fracture surfaces exhibited sorptivities that were very similar to the bulk soil sorptivities. For both organic and inorganic macropore materials, solution pH was generally far more important in determining sorptivity than the nature of the macropore material. Overall the results suggest that the migration of Cd and Mn will likely be more highly retarded in root-derived macropores, and that factors other than sorptivity (e.g. hydrology) will be more important in determining whether retardation of Cd and Mn is greater or less in the bulk soil versus inorganic macropores.

GASOLINE CONTAMINATION OF WATER WELLS IN A CRYSTALLINE ROCK AREA MADISON COUNTY, GEORGIA

№ 102551

STEELE, William M., Georgia State Univ., Dept. of Geology, Atlanta, Ga. 30303

Water levels were measured and water samples analyzed from wells in the Neese community, Madison County, Georgia to evaluate the (a) source(s) and (b) areal extent of ground-water contamination by gasoline. Contamination was first reported in December 1982 when the local health department received a complaint concerning an odor and taste of gasoline from well water. Neese is located in the Piedmont Province and is underlain by a sillimanite-mica schist which weathers to a mica-rich saprolite. Ground-water in the area occurs under unconfined conditions. Water is supplied by (a) bored wells that obtain water from the saprolite zone and (b) drilled wells that obtain water from the unweathered rock zone. Drilled wells have steel casing installed from land surface into unweathered rock whereas bored wells are cased with large-diameter concrete pipes that are not sealed or grouted. For these reasons, bored wells are more susceptible to contamination from surface and underground sources.

Analyses performed on water samples from 7 bored and 3 drilled wells revealed that 1 bored well was contaminated with components of gasoline. Ground-water flow is probably fracture controlled because no other bored or drilled wells were contaminated with gasoline. A potentiometric map of the area, constructed from water-level