Association of Environmental & Engineering Geologists

California Central Coast Chapter

May 17th, 2007

6pm Social Hour & Food

7 – 8pm Meeting Presentation

The Geological Society of America and Association of Environmental & Engineering Geologist Distinguished Jahns Lecturer

GEOLOGIC INFLUENCES ON MIDCONTINENT DAMS

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Geology and geologic processes strongly influence the siting, design, and operation of dams. Geologic site characterization for dam projects is among the most interesting challenges for the engineering geologist. This presentation will focus on some representative examples of the influence of geology on the design and performance of a number of Corps of Engineers' Kansas City District dams. All of the dams are either earth fill or rock fill and are founded on what appears at first glance to be rather monotonous flat-lying sedimentary rocks. However, successful dam construction on the apparently mundane geology can present significant challenges and requires careful attention to detail.

Seven dams founded on sequentially younger bedrock (Cretaceous through Ordovician) will be discussed. The dams are Harlan County in Nebraska; Wilson, Milford, and Clinton Dams in Kansas; and Long Branch, Blue Springs, and Stockton Dams in Missouri. The presentation will include discussion of:

- stability of a structure founded on jointed and faulted chalk containing bentonite beds
- high pore pressure in foundation shale
- potential for liquefaction of loose foundation sands during earthquake
- riprap considerations in areas of poor quality riprap stone
- effect of crayfish holes on pore pressure dissipation
- low residual strength of underclays
- potential for reduced strength in shale due to ice thrusting
- effects of high residual stress on excavated shale slopes
- post-impoundment spring at karst site
- rock fragmentation problem