



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2004KY44B

Title: Assessing groundwater age, regional flowpaths, and hydrochemical evolution of the Knox Group Aquifer in the Bluegrass Region of Kentucky

Project Type: Research

Focus Categories: Groundwater, Hydrogeochemistry, Water Supply

Keywords: stable isotopes, Chlorine-36, brine

Start Date: 03/01/2004

End Date: 02/28/2005

Federal Funds: \$18,000

Non-Federal Matching Funds: \$38,230

Congressional District: KY 6th

Principal Investigator:

Harry Rowe

Abstract

The Cambro-Ordovician Knox Group dolomites in the subsurface of Kentucky are host to a regionally extensive aquifer system that could potentially play an important role in future water resource developments of the region. Preliminary water quality assessments, based largely on total dissolved solids concentrations from wells drilled into the Knox Group, identify large portions of the aquifer as being saline; however, a freshwater portion of the aquifer in the central Bluegrass Region is potentially useful for rural and suburban use. The proposed study expands on previous work in order to 1) define the age of Knox Group ground waters along locally-inferred flowpaths, 2) identify regional flowpaths, including important recharge-discharge zones, and 3) characterize the evolution of ground water within the Knox Group. The proposed research relies largely upon isotopic tracers to uncover subtle and large differences in ground water characteristics that can be used to infer ground water age and the processes that alter water chemistry. A clearer understanding of flow regime and rates of ground water movement within the Knox Group aquifer will yield a more effective strategy for exploitation of water resources within the Bluegrass Region.