Threats to Surface and Karst Groundwater of Mammoth Cave National Park from The Arthur Oil Field, Kentucky

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Abstract

In the early 1990s, a small oil boom began in Edmonson County, Kentucky. Oil production continues and a number of wells have been drilled on properties adjacent to the southwestern edge of Mammoth Cave National Park. Besides being the world's longest cave, Mammoth Cave is one of the premier "reference" caves for understanding cave and karst systems. In January of 1997, a well fitting ruptured, spilling over 2,000 liters of crude oil that flowed on the surface into the park. Only a quick and coordinated effort prevented the oil from sinking into, and contaminating, the primary karst aquifer. This spill highlighted the potential threat posed by these wells, and demonstrated the need for a better understanding of the karst hydrogeology of this region of the park, to better prepare for future threats associated the numerous oil wells and other petroleum facilities.

In order to prepare for potential threats in the area, scientists and students of Western Kentucky University and the National Park Service are cooperating in the development of a geographic information system (GIS) data base which depicts the hydrogeology, oil well location data, karst features, access roads, and, in particular, surface and subsurface flow routes adjacent to these oil facilities. This database will then be distributed to the various agencies, organizations, and emergency response personnel, including a summary map for use in the field during emergency responses and to better plan and coordinate future efforts.