

## USACE 2001 ENVIRONMENTAL DEVELOPMENT WORKSHOP

### WORKSHOP ABSTRACT

#### AUTHORS:

Karen Tyrell, Ph.D. (Presenter)

Angela Schmidt, M.S.

#### AFFILIATION:

BHE Environmental, Inc.

T (865) 922-4305

F (865) 922-8495

[ktyrell@bheenv.com](mailto:ktyrell@bheenv.com)

#### TOPIC: MEASURING AND MONITORING

**ABSTRACT:** Contamination in Sediment and Selected Fish Species Collected from Fort Leonard Wood, Missouri.

The military uses numerous chemicals in munitions, obscurants, fuels, lubricants, and solvents that could adversely affect the environment. These materials and their by-products may contain polycyclic aromatic hydrocarbons (PAHs). PAHs can accumulate in biota and inorganic media such as soil and sediment. PAHs vary in degree of toxicity for aquatic organisms and can cause carcinogenic effects in biota. PAHs may accumulate in sediment in aquatic habitats, where they can become bioavailable over time. This accumulation can lead to prolonged exposure to PAHs by aquatic organisms even after the source is removed. In this paper, we present preliminary results from an ongoing five-year study at Fort Leonard Wood, Missouri. This study monitors concentrations of environmental contaminants in fish and sediment on the Installation, and correlates these findings with military activities. Several classes of environmental contaminants are being monitored; we will discuss only results of PAH analyses. Paired exposure (on the Installation) and reference sites on two waterways (Roubidoux Creek and Big Piney River) were sampled. Reference sites were located in the Mark Twain National Forest. Fish samples were analyzed for percent lipid concentration, whole-body PAH concentrations, cytochrome P450 reporter gene system activity, and concentration of PAH metabolites. Initial results indicate a positive correlative relationship among these four parameters. Fish with the greatest concentration of lipids and PAH metabolites had the most active cytochrome P450 reporter gene induction. This is indicative of past exposure to PAHs. Sediment PAH concentrations varied at all four-sample locations. Fish with the greatest concentrations of PAHs were collected in locations where sediment concentrations were the highest. Additional monitoring data will be available at the time of the presentation.