

# A RAPID, INEXPENSIVE LEACH TEST TO ASSESS POTENTIAL LEACHING OF SOLUBLE CONSTITUENTS FROM MINE WASTES, SOILS AND OTHER GEOLOGIC MATERIALS<sup>1</sup>

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**Abstract:** The U. S. Geological Survey (USGS) has developed a fast (5-minute), simple, and cost-effective leach test that can be used to simulate the reactions that occur when geologic materials are leached by water. The USGS Field Leach Test (FLT) is a modification of a leach test developed by Hageman and Briggs (2000) to screen metal mine waste piles for metals released during snowmelt or rainfall. The FLT uses distilled water to leach the < 2mm fraction of a sample at a 20:1 ratio (20 parts leachate to one part solid). The sample is hand shaken for 5 minutes then filtered using a syringe and 0.45 micrometer filter. Subsamples of the filtrate are collected and preserved for analysis. The procedure uses readily available bottles and equipment. The USGS FLT has been used to assess the geochemical interactions between water and a broad variety of geologic materials, including: metal mine wastes (i.e., Hageman, 2004); dusts generated by the collapse of the World Trade Center towers on September 11, 2001 (Clark and others, 2001; Plumlee and others, 2005); surface applications of biosolids (processed sewage sludge) on soil, crops, groundwater, and streambed sediment (Yager and others, 2004); as well as leach studies of flood sediments deposited in the New Orleans area after Hurricane Katrina; volcanic ash from numerous eruptions; and in studies of many other diverse matrices. The USGS FLT has been an integral part of these investigations and has demonstrated its value as a geochemical research tool. It has enabled researchers to understand which elements in a solid are made potentially bioaccessible due to leaching by water, and to understand potential impacts of water-solid interactions on the surrounding environment.

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