

**NATIONAL EVALUATION FOR DEVELOPMENT AND EXPLORATION POTENTIAL
OF MINERAL COMMODITIES IN PRODUCED WATERS**

Stephanie L. Ray*

Dept. of Geological Sciences
University of Texas at El Paso, El Paso, TX
500 West University Ave
El Paso, TX 79968
915-747-5503
slray@miners.utep.edu

Mark A. Engle

U.S. Geological Survey
Reston, VA

Produced waters contain virtually every naturally occurring element making them a potentially under utilized resource. Thus, a national evaluation of the mineral commodity potential of produced waters is warranted. This investigation completes this evaluation utilizing the United States Geological Survey (USGS) produced waters geochemical database (Version 2.1), which is a compilation of records from approximately 160,000 samples providing major and trace element data for produced waters from hydrocarbon and geothermal wells.

National maps will show spatial differences in concentrations for constituents of interest, estimated economic values of the commodities, and correlation among potential mineral sources. Estimated gross values are considered based on element concentration per well, per barrel of water. The identification of mineral commodities in produced water resulting from statistical outlier analysis will narrow and serve as a powerful tool for exploration or extraction of strategic elements. Detailed economic analysis for the Permian basin will be used as a model for demonstration. This effort highlights an opportunity for mineral commodities and improving water sustainability.

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