**REE Characterization R&D**

**OBJECTIVES**

Identify, locate, field sample, and analyze US domestic coal and coal byproduct solid and/or liquid materials to identify high REE concentrations.

NETL FUNDED FIVE PROJECTS FOCUSED ON:

- Sampling and characterization of pre-combustion coal-related materials to identify suitable material for recovery of REEs.

Characterized coal types: Bituminous, Subbituminous, and Anthracite

**ACCOMPLISHMENTS**

These projects furthered program goals by determining the most viable sources of materials to support future research and development and commercial REE production.

- Analyzed samples and found REE concentrations exceeding 300 parts per million (ppm) from:
  - Acid mine drainage precipitate and coal samples from Northern and Central Appalachia coal basins.
  - Coal preparation plant refuse from West Kentucky No. 13 bituminous coal in the Illinois Coal Basin and rock samples from Eastern PA anthracite coal seams.

**IMPORTANCE**

DOMESTIC REE RECOVERY BENEFITS THE UNITED STATES

**INCREASE NATIONAL SECURITY:** Domestic REEs would lessen or eliminate dependence on foreign REE production.

**INCREASE REVENUE FOR ENERGY SECTOR:** Utilization of coal byproducts as a feedstock for REE recovery will provide additional revenue for the coal industry.

**ECONOMIC GROWTH:** Domestic REE recovery would allow the U.S. to export REEs to other countries and developing industries in places where coal has played an important economic role.

**PROJECT AWARD TOTALS**

- DE-FE0026448
  - University of Kentucky
  - Tetra Tech, Inc. (2 projects)
  - Technology Manager: Mary Anne Alvin
  - Team Supervisor: Patricia Rawls
  - Total Award: $749,500

- DE-FE0026444
  - West Virginia University
  - Technology Manager: Chuck Miller
  - Team Supervisor: Vito Cedro
  - Total Award: $214,795

- DE-FE0026627
  - University of Kentucky
  - Technology Manager: Chuck Miller
  - Total Award: $400,000

- DE-FE0026929
  - West Virginia University
  - Technology Manager: Vito Cedro
  - Total Award: $400,000

Coal basins found to date as having at least one sample with >300 ppm REEs:

- SANDSTONE Core Sample (above seam)
- CLAY Below seam
- REDSTONE SHALE Overburden
- COAL Ash
- ANTHRACITE Coal
- CARBONACEOUS SHALE Core Sample (below seam)
- SHALE Overburden
- CLAY Below seam

Technology Manager — Mary Anne Alvin
Team Supervisor — Patricia Rawls

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*Gd: IUPAC Light REE; USGS Heavy REE
*Included with rare earth elements