

# **INL RFP INFORMATION BRIEFING**

## ***Application of Engineering & Technology to Environmental Issues***

***Develop and transfer advanced technology solutions to national and international needs***

# ***Grand Challenge***

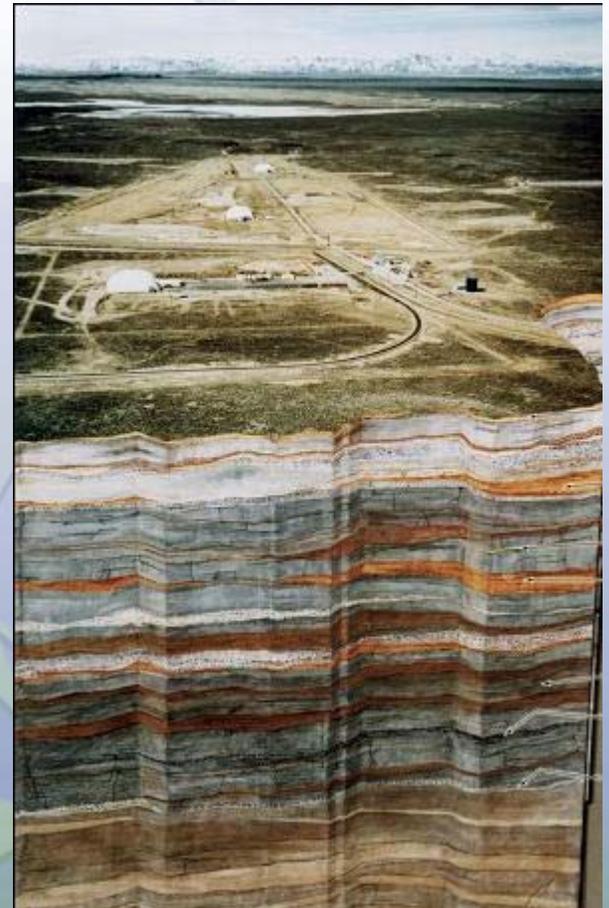
## ***Environmental Sustainability***

- ***The majority of DOE's difficult cleanup issues are related to subsurface contamination***
- ***The proposed final resting place for the majority of DOE's stabilized wastes will be in subsurface repositories or disposal areas***



# ***Environmental Sustainability requires an improved understanding of the Subsurface***

- ***Protection of the world's aquifers and ecosystems***
- ***Containment of hazardous materials***
- ***Improved predictions of contaminant fate and transport***
- ***Identification, characterization, and utilization of energy reserves***
- ***Accurate interpretation and prediction of processes controlling carbon cycling and sequestration***
- ***Energy & Water Nexus***



# **CORES**

***(Consortium for Research on the Earth's Subsurface)***

- *CORES is an overlying strategic concept to develop a national research agenda to provide new knowledge to solve currently “intractable” subsurface problems*
  - *Examples are flow through fractured media, carbon sequestration, control of subsurface processes, etc.*
  - *Gaining support from multiple offices and agencies*
    - *NSF, OSc, NAS, professional societies*
    - *Partnered with LBNL*

# ***PFN and NG probes***

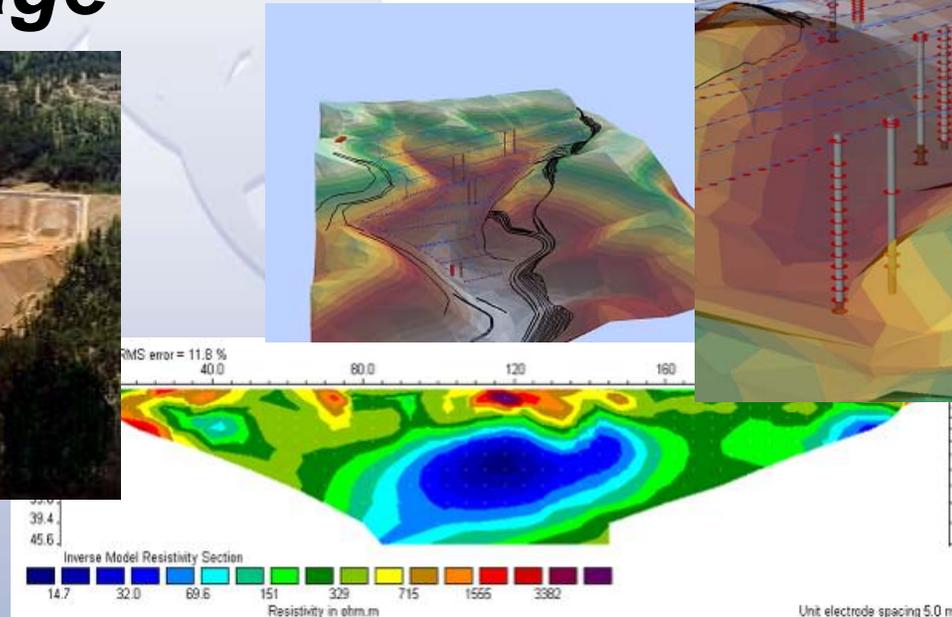
***(prompt fission neutron and neutron gamma)***

- *Now being tested and calibrated*
  - *Applications for insitu and exsitu assay at INL and Hanford*
  - *Other potential applications in mineral and petroleum industries*

# ***Insitu monitoring***

- *Gilt Edge Mine system implemented for EPA region 8 defines state-of-the-art*
  - *NEAR REAL TIME access to subsurface data and intelligent processing capabilities from remote locations*
    - *Applications in monitoring closed sites in the DOE complex, national waste and spent fuel repositories, and other contaminated sites*

# ***Electrical Resistance Tomography System Monitors Ruby Gulch Acid Rock Drainage***

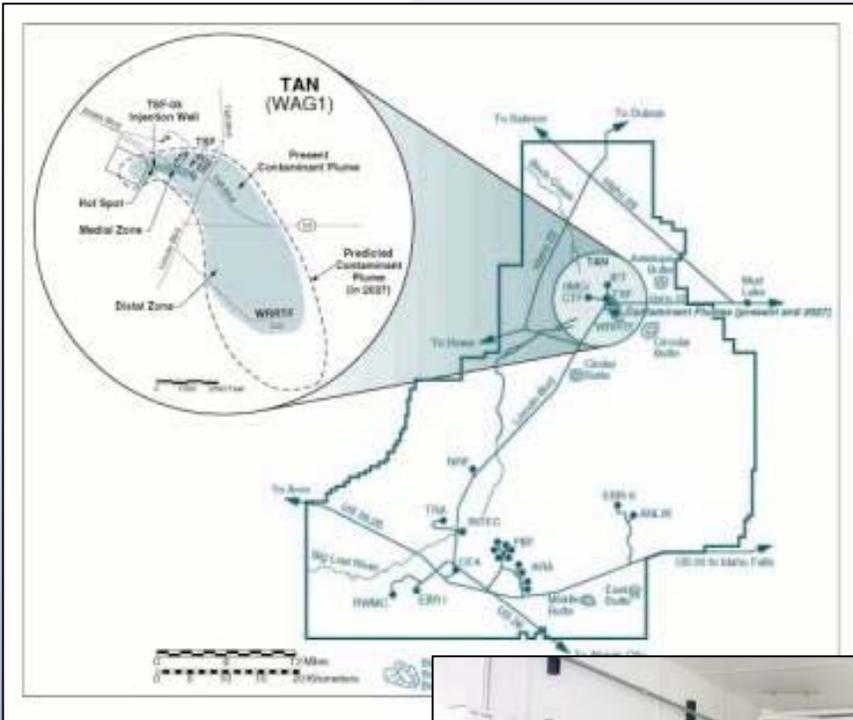


- ***270-acre Gilt Edge Mine site in South Dakota***
- ***70-acre isolation-containment facility***
- ***650-electrode array of down-hole and surface electrodes***
- ***Autonomous, remotely controllable data acquisition***

# ***Insitu Bioremediation***

- *Initial success at TAN to treat TCE in a groundwater plume*
- *Another geo-biochemistry developed to treat Sr in groundwater at INL and Hanford*
  - *Proposal being evaluated by OSc to expand current EMSP projects scope*
    - *New scope supported by potential end-users*
- *Potential system to treat Carbon-tet plume from RWMC being evaluated*
  - *EMSP projects*

# ***Enhanced Bioremediation and Natural Attenuation at INEEL***



- ***Cost effective alternative to groundwater Pump and Treat***
- ***Significantly reduced remediation time***
- ***No generation of secondary waste streams***
- ***Cost Savings: \$25M***
- ***Schedule: 50% reduction***
- ***Licensed to Northwind Environmental***

