Capability Package

US Army Engineer
Research and Development Center
Waterways Experiment Station

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ERDC Geotechnical and Materials Expertise Applicable to Abandoned Mine Lands

Statement of Need:

Remediation or restoration of abandoned mine lands (AML) requires extensive geotechnical and materials expertise and experience at real-world sites. Within ERDC, this expertise can be mobilized quickly to augment or extend the expertise available in Corps Districts and from other federal and state partners. ERDC experience on interdisciplinary and interagency task forces can contribute to a holistic approach to abandoned-mine issues by the Corps team, and deal with mine drainage at its source. The following areas of ERDC geotechnical and materials expertise are available to address AML needs.

Abandoned Mine Site

1. Location, shape, depth, dimensions, and significance of subsurface geologic features such as the mines themselves, major rock joint systems, or associated karst features, that will impact mine drainage, groundwater movement, and origin and offsite transport of contaminants
2. Design and stability of berms, access roads, sediment retention structures, and other embankments
3. Geotechnical conceptualization and engineering geological site characterization
4. Selection and use of geophysical tools and methods for subsurface characterization.
5. Interpreting engineering significance of surface and subsurface data
6. Slope stability analysis, from selection and application of appropriate analytical tools to interpretation and presentation of data
7. Regional hydrogeology, and assessing the regional impact of proposed geotechnical modifications in light of subsurface geology
8. Identifying subsurface hydrogeologic connectivity and interpreting geological control on flow regimes
9. Interpreting mineralogic and geochemical data in a forensic framework, and determining likelihood of stability of mine-isolation or embankment materials in various geochemical settings
10. Selecting materials and proportioning specially-tailored grouts and concretes for enhanced geochemical stability in acid conditions or excessively mineral-rich waters

11. Detailed mapping of subsurface geologic features from macro- to micro-scales
12. Selection and application of 3-D visualization tools for geotechnical, geologic, and hydrogeologic features
13. Integrated geo-data management, combining the power of multiple computer technologies with geotechnical expertise and knowledge of how data are used in practical engineering decisions
14. Geoarchaeologic interpretation of geomorphic features, and assessment of potential impacts on these features through engineering modifications to flow or erosion rates
15. Location parameters, design review, and stability analyses of temporary roadways
16. Interpretation of the engineering significance of geomorphic features, and the interface for geomorphologic interpretation and wetlands or riparian habitats

ERDC geotechnical engineers and engineering geologists have experience with all of these issues of potential importance to abandoned-mine land initiatives. ERDC POC for geotechnical areas of interest: Dr. Lillian Wakeley (601-634-3215, Lillian.D.Wakeley@erdc.usace.army.mil); ERDC POC for AML program is Ms. Kathleen D. White (603-646-4187, Kathleen.D.White@erdc.usace.army.mil). OCE POC for AML issues: Dr. Mike Klosterman (202-761-8682), Michael.J.Klosterman@HQ02.usace.army.mil.