

NABIR Field Research Center—Oak Ridge, Tennessee

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NABIR Research Objectives and Results. To encourage hypothesis-based field research and process-level understanding, the NABIR program has established a Field Research Center (FRC). The FRC provides a site for investigators to conduct field-scale research and to obtain DOE-relevant subsurface samples for laboratory-based studies. The FRC is located on the U.S. Department of Energy's Oak Ridge Reservation (ORR) in Oak Ridge, Tennessee. Staff from Oak Ridge National Laboratory's Environmental Sciences Division has operated the FRC since April 2000. Both contaminated and background (uncontaminated control) areas are located on the ORR's Y-12 National Security Complex in Bear Creek Valley. The initial focus of research at the FRC has been on in situ biostimulation experiments to promote the immobilization of uranium and technetium, but future research will be expanded to include EMSP investigators and other relevant DOE contaminants (e.g., organics, Hg, and other metals) and other processes.

The FRC is used by investigators for various purposes, including:

- Laboratory studies on FRC groundwater and sediment samples and humic material by dozens of national laboratories and universities
- Evaluation of new field and laboratory characterization and monitoring methods
- Multidisciplinary in situ accelerated bioremediation research projects
 - In situ Uranium Reduction Experiments Using Push-Pull Techniques (Jack Istok, Oregon State; located in Areas 1 and 2)
 - Field-scale Bioreduction of Uranium (Craig Criddle, Stanford; located in Area 3)
 - In situ Immobilization of Uranium in Structured Porous Media via Biomineralization at the Fracture/Matrix Interface (Tim Scheibe, PNNL; located in Area 2)

FRC Working Groups were established to coordinate technical efforts across FRC field and laboratory projects, identify key technical issues that need to be investigated, and stimulate cross-disciplinary evaluation and integration of data and findings.

The Working Groups are currently organized around four topics (Overall lead—Phillip Jardine, ORNL):

- Microbial community analysis (Lead—Joel Kostka, Florida State)
- Geochemical/geophysical characterization (Lead—Phillip Jardine, ORNL)
- Rates and mechanisms of microbially mediated metal reduction (Lead—Bill Burgos, Penn State)
- Numerical modeling (Lead—Jack Parker, ORNL)

Additional information and data can be obtained at the FRC website: <http://www.esd.ornl.gov/nabirfrc/>.