Environmental Science Division

The mission of the Environmental Science Division (EVS) is advancing in formed environmental decision making. It conducts applied environmental research, assessment, and technology development, primarily for federal agencies that have responsibilities for energy development and use, natural resource management, or national defense.

DEVELOPMENT OF ADVANCED ENVIRONMENTAL TOOLS

Programmatic knowledge and practical field experience are combined in developing innovative tools and approaches that facilitate achieving technical objectives. An example is the development of Bayesian Approaches for Adaptive Spatial Sampling (BAASS) software to support accelerated sampling of contaminated sites. Advanced information and visualization technologies are used to compile, manage, and communicate environmental information.

SITE ENVIRONMENTAL RESTORATION AND STEWARDSHIP

Environmental evaluation and planning projects address soil, surface water, sediment, and groundwater at sites contaminated by past federal activities. EVS assists federal cleanup managers with technical problems as diverse as radiologically contaminated soil, military munitions disposal areas, and groundwater contaminated with carbon tetrachloride. Remedies range from precise excavations to innovative combinations of engineered wetlands and phytoremediation. Assessments are also conducted of approaches for long-term stewardship of remediated sites with residual contamination.

ATMOSPHERIC AND CLIMATE RESEARCH

The Division performs fundamental process-oriented research and analysis in the areas of aerosol science, boundary layer and micrometeorology, air quality, global climate, remote sensing, and atmospheric chemistry. In support of climate research, EVS provides and maintains instruments that measure key climate variables that range from routine surface observations of wind speed and direction, temperature, and relative humidity, to advanced remote sensing of aerosol distributions in the atmospheric boundary layer.

In addition, EVS employs its significant air quality modeling resources to assess the potential impacts of such major activities as the large-scale development of coalbed methane extraction systems and the diversion of federal lands in Clark County, NV, to urban and other uses.

RISK-BASED ENVIRONMENTAL ASSESSMENT AND MANAGEMENT

Information and tools are developed to support decision making based on health, safety, environmental, economic, and socio-cultural risks. As an example, the EVS-developed set of RESRAD codes are the leading methodology approved by the U.S. Department of Energy for evaluation of cleanup guidelines at sites formerly used

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A U.S. Department of Energy laboratory managed by UChicago Argonne, LLC

for nuclear material production. These codes permit the estimation of risk to human health and the environmental (eco-risk) due to contaminated environmental media and buildings.

INTEGRATED ENVIRONMENTAL ASSESSMENTS

Under the National Environmental Policy Act (NEPA), federal actions require an environmental assessment, with an Environmental Impact Study (EIS) being needed for significant actions. EVS has extensive experience assisting federal agencies in the preparation of important EISs such as the recent one completed for the Department of Interior for the right-of-way renewal for the Tran-Alaska Pipeline System. Such assessments require many and diverse environmental analyses as well as responses to comments from the public and other stakeholders. The Energy Policy Act of 2005 requires federal agencies to prepare Programmatic Environmental Impact Statements (PEISs) for important new federal energy actions. EVS has led the preparation of three PEISs on: designating energy corridors on federal lands in 11 western states; oil shale and tar sands resources leasing in Bureau of Land Management lands in Colorado, Utah, and Wyoming; and renewable energy and alternate use on the Outer Continental Shelf, managed by the Department of Interior.

NATIONAL SECURITY

Many EVS core capabilities, including modeling and analysis skills, are applicable to national security programs. The objective of these programs is to support efforts to reduce national and international threats from nuclear, radiological, biological, and chemical materials and to evaluate the risks and responses to incidents involving those materials.

ENVIRONMENTAL POLICY AND PLANNING

Studies are being conducted to characterize environmental, economic, and social implications of proposed policies and regulations applicable to energy systems and federal facilities. Technical assistance is also given for planning, management, and training to facilitate compliance with current and long-term environmental regulatory requirements. Analyses in this area have, for example, included independent feasibility studies of the technical, regulatory, economic, and risk implications of promising oil field technologies to mitigate environmental impacts. EVS has investigated issues of national import such as the improvements in environmental management of coal combustion wastes and the environmental policy and regulatory constraints to natural gas production.