

Integrated Science to Understand Contaminants Associated with the Lifecycle of Energy Resources

The **USGS Energy Lifecycle Integrated Science Team (IST)**, a part of the Environmental Health Program, conducts research on potential contaminant exposures in the environment that originate from the life cycle of energy resources. Their research is completed in laboratories, at targeted field sites, and in watersheds across the Nation to deliver science on exposures and risks to wildlife, humans, and the environment. Potential contaminant releases are associated with transportation, storage, extraction, and management of energy-related products and wastes.

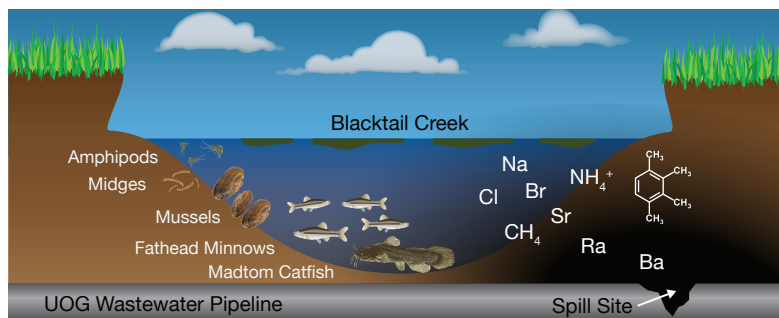
Energy IST researchers provide science to support the utilization and protection of our Nation's resources. Their work aims to:

- **Identify Sources of Contaminants from Energy-Related Materials**
- **Identify Potential Pathways of Contaminants to/in the Environment**
- **Evaluate Reuse Potential of Unconventional Oil and Gas (UOG) Wastes**
- **Evaluate Environmental Responses and Recovery from Energy Lifecycle Activities**
- **Determine Toxicity and Risks to Organisms from Energy-Associated Materials in the Environment**



The Energy IST brings together geochemists, microbiologists, ecologists, toxicologists, and hydrologists to address complex issues across disciplines. They analyze various environmental media and study organisms along the food chain (including groundwater, surface water, soils, insects, native vegetation and crops, fish, amphibians, and mussels) to understand pathways and toxicity of contaminants.

The team has documented sources and composition of toxic elements associated with the energy lifecycle and investigated effects to organisms at sites impacted by releases. They are advancing the understanding of health risks for aquatic and terrestrial species. In addition, they are developing new decision tools that can be used to look at risks to water resources and vulnerable species. They are broadening that foundational research to understand environmental health risks at similar sites across the Nation.



The team provides scientific data, tools, and predictive models to understand potential environmental health effects of energy-associated contaminants to the public and diverse stakeholders. They work hand in hand with stakeholders including Federal, state, and local resource managers, public health experts, the public, and industry. **Stakeholders use the team's science to protect vulnerable fish and wildlife, prioritize clean-up and restoration of contaminated sites, and manage energy waste products via recycling/reuse and safe disposal.** For example, as water becomes more scarce with global climate change, this team provides fundamental and applied science about the contaminants in oil and gas wastewater and waste products produced during the energy life cycle to reduce human and wildlife exposures. A priority is to address issues around environmental justice in underserved communities.

For more information:

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