Oil and Gas Industry Experience

RTI International supports a wide range of research and consulting needs for oil and gas industry firms—from broad strategic and planning studies to site-specific assessments. Our engineers and scientists understand the emissions, emissions control technologies, process operations, and process optimization opportunities for the petroleum industry. We have developed methods specifically for assessing sites contaminated—or potentially contaminated—by petroleum-related chemicals.

The following projects illustrate our capabilities and experience with respect to oil and gas operations.

**Property Management and Disposition**

- For a major oil and gas firm, RTI evaluated legacy properties—such as refineries, tank farms, and gas stations—to develop a disposition strategy that generates value and minimizes risks. We considered the financial, environmental, and community dimensions of the problem to formulate a balanced approach for a large portfolio of properties. To facilitate this process, we used our own proprietary software tool, SBS Discovery™, to execute focused data collection and develop action plans based on risk management and financial outcomes.

- We are supporting a major oil and gas firm with the disposition of downstream assets. As part of developing an effective disposition strategy, we are examining uncertainty in environmental liability estimates, methods for reducing uncertainty in environmental remediation cost estimates, and methods to manage or transfer the environmental risk.

- We are working with a major oil and gas firm to evaluate management strategies for decommissioning upstream off-shore and on-shore exploration and production assets. We are evaluating decommissioning costs, assessing the uncertainty associated with cost-estimation methods, and developing policies and methods to mitigate adverse financial impacts of future decommissioning activities.

**Environmental Analysis and Research**

- RTI evaluated petroleum refinery operations to characterize air emissions across a variety of unit processes. As a result, we developed a comprehensive understanding of hazardous air emissions, the processes contributing to the emissions, and the effectiveness and costs of alternative control techniques.

- For the European Union, we evaluated hazardous air emissions associated with the entire petroleum life cycle, from production to end user. We characterized hazardous emissions and developed strategies to minimize emissions across the entire petroleum product life cycle.
• RTI has developed a comprehensive database of physical, chemical, behavioral, and toxicological properties of virtually all petroleum hydrocarbons (PHCs). The database enables users to
  – Run predictive environmental model simulations
  – Evaluate exposure to humans and ecological receptors
  – Characterize risks to humans and ecosystems as a function of noncancer endpoints and carcinogenicity.

• We developed an online database and information system that covers 900 remediation technologies developed or used in the United States and abroad. Users can search by technology type, vendor, media addressed, contaminant, and waste/site type. Technology summaries include process descriptions, performance data, case studies, cost information, and vendor profiles.

Site-Specific Environmental Studies and Methods
• We evaluated methods for determining vapor intrusion risk and programs aimed at detecting and mitigating vapor intrusion. This work included evaluation of the vapor intrusion risk associated with various volatile and semi-volatile compounds, including those associated with petroleum contamination. We evaluated both the technical effectiveness and cost of mitigation measures.
• For the United Arab Emirates, we conducted environmental reviews of contaminated industrial sites using petroleum characterization data, including an assessment of applicable analytical methods and screening of cleanup levels, and remediation options.
• RTI is leading efforts on a large industrial site to characterize groundwater contamination, evaluate hydrologic conditions, and maintain a large-scale groundwater pumping operation for contaminant containment. Sources of contamination included volatile organic compounds and PHCs.
• We have developed and are continuing to enhance a geospatially explicit multimedia, multipathway modeling system that is used to
  – Simulate the release of PHCs from ponds, soil, waste management units, and other types of sources
  – Simulate the fate and transport of PHCs or other contaminants across soil, air, water, plants, and other environmental compartments
  – Estimate pathway-specific exposures for human and ecological receptors
  – Generate a distribution of hazard/risk that represents the variability and stochasticity of the system.

The modeling system is designed to characterize potential risks on a site-specific basis, drawing on available data.
• Our experts have conducted dozens of site-based environmental risk assessments on a wide variety of organic compounds associated with PHCs, including polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, xylene, ethylbenzene, and naphthalene. These predictive risk assessments are used to characterize the potential for adverse health and ecological outcomes associated with different types of release scenarios, and typically involve the comparison of risks for baseline conditions with residual risks after the implementation of various mitigation strategies. RTI has analyzed acute, short-term, and chronic release patterns and associated health responses.

We use both qualitative and quantitative methods to interpret the modeling results, ensuring that the quantitative model results are considered within the context of the scientific evidence with respect to bioavailability of chemicals in different types of exposure matrices.

More Information
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