



Persistent, Bioaccumulative, and Toxic (PBT) Substances



Valued wildlife species, such as the polar bear, may be exposed to PBT substances through the food chain, though they may live far from the primary source of the substance.

Registering a new pesticide, developing a risk management strategy, cleaning up a contaminated site, conducting a cost-benefit analysis...these activities involve highly complex and challenging science and risk issues. How these issues are addressed can have a major impact on the decision-making that may be involved, which in turn can affect lives, livelihoods, and the environment. Ensuring these decisions are based on the most solid scientific data and analytical methods is key. Equally important is how any uncertainty and variability of the data and methods are considered and presented.

For more than 20 years, ICF Consulting has met these challenges by providing technically sound, legally defensible environmental science and risk services. More than 300 of our staff provide services in human health and ecological risk assessment, population exposure assessment, toxicology, environmental impact assessment, environmental data analysis, statistical analysis, and related technical analysis for litigation, regulatory, and other support. We have successfully completed thousands of projects for a diverse client base encompassing a wide variety of multinational corporations; trade associations; local, state, and federal governments (both foreign and domestic); and research institutions.

What are PBTs?

Persistent, bioaccumulative, and toxic (PBT) substances are compounds that possess all three of the following characteristics, making them particularly problematic pollutants:

Persistent. Some substances are very persistent in the environment, with lifetimes on the order of decades to centuries. The molecular structures of these compounds allow them to resist the natural fate processes in the atmosphere, waters, and biota that break down other pollutants.

Bioaccumulative. Substances that concentrate in fatty tissue tend to build up to much higher concentrations in humans and other organisms. They are also more likely to transfer and accumulate up the food chain.

Toxic. Laboratory, field, and epidemiologic research indicate that some substances cause or are suspected to cause adverse effects to humans and wildlife in ways that range from minor skin irritations to cancer.

Women and children have been found to be particularly susceptible to the

effects of some PBT compounds. In addition, wildlife exposure to PBT substances is of significant concern, particularly for species at the upper levels of the food chain (e.g., carnivores such as polar bears that consume seals). Certain ecosystems, such as the Great Lakes, are also particularly vulnerable to PBT pollution, due to factors such as their location, size, and food web structure.

As a result of these concerns, some PBT substances (e.g., DDT, PCBs) have been banned or otherwise restricted by industrialized countries and many developing countries. But PBT substances continue to present potential risks to human health and the environment, governments, public interest groups, industry, and academia continue to focus on them.

Featured Solutions

ICF Consulting has a broad range of experience related to identifying, evaluating, and managing PBT substances. This experience includes method and guidance development; risk-based ranking; chemical assessments; source characterization; and policy development. A sample of PBT

substance-related project experience

includes the following:

Featured Solutions (continued)

PBT Policy Implementation Guidance. For a major industry chemical trade organization, ICF Consulting assisted in the preparation of guidance that included a screening approach to identify PBT chemicals, an exposure assessment methodology, and risk management options for the chemical industry.

Great Waters Focus Chemicals. For the U.S. Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards, ICF Consulting developed and implemented a ranking system based on PBT criteria to identify hazardous air pollutants of priority concern.

Comprehensive Review of Screening Tools. For the U.S. EPA Office of Solid Waste (OSW), we provided technical analyses and meeting support for a multi-stakeholder team that evaluated more than 50 risk-based chemical screening tools to identify a candidate tool that could be used for ranking hazardous waste constituents based on PBT criteria.

Waste Minimization Prioritization Tool (WMPT)

Development. For U.S. EPA OSW, ICF Consulting provided technical support for the conversion of the Use Clusters Scoring System into WMPT, a software tool for prioritizing chemicals in hazardous waste for pollution prevention efforts based on PBT criteria and quantity. ICF Consulting identified, collected, and evaluated sources of PBT data, provided technical analysis for development of the software tool, and drafted the technical support document.

Review of PBT Scoring Methods. In a quick turn-around project for a major industry trade association, we compiled and evaluated chemical ranking systems and compared PBT definitions, quantitative thresholds used for scoring, and applications of the three criteria.

PBT Chemicals List Development Support. For the U.S. EPA OSW, ICF Consulting prepared dossiers describing the PBT characteristics of chemicals that ranked high based on a screening analysis. The dossiers were used to finalize the initial list of PBT chemicals that would be used as the basis for the final Resource Recovery and Conservation Act (RCRA) PBT Chemicals List.

Evaluation of PBT Data. ICF Consulting reviewed and analyzed a draft list of 19 persistent organic pollutants (POPs) proposed by the United Nations Economic Commission for Europe (UNECE). Our efforts focused on compiling and evaluating test data relevant to the persistence, bioaccumulation potential, long-range transport potential, and toxicity of each of the substances.

Great Lakes Water Quality Initiative (GLWQI) Wildlife Criteria. ICF Consulting assisted the U.S. EPA Office of Water in revising GLWQI wildlife toxicity reference values for DDT, dioxin, PCBs, and mercury. ICF Consulting evaluated toxicity studies, included revised exposure factors for wildlife species, and incorporated changes in the method for calculating wildlife criteria from wildlife feeding habits, trophic level, and bioaccumulation factors.

Emission Inventories. ICF Consulting created a global POPs inventory, gathering and analyzing data related to worldwide production, trade, stockpiles, emissions, exposures, and concentrations in environmental media for 12 POPs for more than 80 countries.

Policy Development Support. For a multi-stakeholder round table established by Environment Canada, ICF Consulting provided analytical support in the development of policy options and controls for releases of 16 toxic substances, including PBT compounds, from integrated steel mills and electric arc furnaces.

ICF Consulting's GSA Contract Vehicles

- Environmental Services GSA Schedule #GS-10F-0124J
- Management, Organizational, and Business Improvement Services (MOBIS) GSA Schedule #GS-23F-8182H
- General Purpose Commercial Information Technology Equipment Services GSA Schedule #GS-35F-4121D
- Marketing, Media, and Public Information Services GSA Schedule #GS-23F-0115K
- Logistics Worldwide (LogWorld) GSA Schedule #GS-10F-0578N
- Professional Engineering Services (PES) GSA Schedule #GS-23F-0016P

About ICF Consulting

ICF Consulting is a leading management, technology, and policy consulting firm. Drawing upon extensive industry knowledge, distinguished professionals, and innovative analytics, the firm develops solutions to complex homeland security and emergency management, community development, energy, environment, and transportation issues. ICF Consulting's approach to these issues is strengthened by its expertise in information technology, organizational improvement, program management, and communications. Since 1969, ICF Consulting has been serving major corporations, government at all levels, and multinational institutions. More than 1,000 employees serve these clients in the Americas, Europe, Asia Pacific, and Africa.

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