



# North American Action on Dioxins, Furans and Hexachlorobenzene

Canada, Mexico, and the United States are currently preparing a Phase 1 of a North American Regional Action Plan (NARAP) on dioxins, furans and hexachlorobenzene to reduce environmental exposure to these substances.

Dioxins and furans are a family of toxic, synthetic, chlorine-based hydrocarbons that pose risks to humans and wildlife. Hexachlorobenzene (HCB), which poses similar environmental and health risks, is included in the NARAP because it is generated by many of the same combustion processes that produce emissions of dioxins and furans, particularly the burning of municipal waste. All three substances are among the “dirty dozen” persistent organic pollutants (POPs) that have been singled out for global action under the Stockholm POPs Convention, signed by over 100 countries in May 2001.

## What are dioxins and furans?

Dioxins and furans constitute a family of more than 200 similarly structured chemical compounds, often known collectively as dioxins, that form as byproducts of combustion and various industrial processes. They are persistent, bioaccumulative toxic substances, about 30 of which are considered to have significant toxicity.

Although dioxins and furans can also form as a result of certain natural processes, such as volcanoes and forest fires, the largest known emissions source for them in North America is waste combustion. They are also produced in chlorine-based pulp and paper bleaching, certain types of processing and manufacturing, including the manufacture of some pesticides, and other industrial processes. Human activities account for the majority of dioxin releases and the resulting exposure in humans and wildlife. Once in the environment, they degrade very slowly, persisting for a decade or more.

## The NARAP on dioxins, furans and hexachlorobenzene

A North American Task Force was established in 1999 to prepare a NARAP on dioxins and furans, and hexachlorobenzene. The work plan calls for the development of a two-phase action plan. Phase one will focus primarily on capacity building and data gathering, while phase two will focus more on risk management. The NARAP will:

- Provide a framework for information sharing and expert exchanges to reduce generation of dioxins and furans and hexachlorobenzene;
- Define actions to reduce releases and exposure to dioxins, furans and hexachlorobenzene to the North American environment;
- Develop and promote outreach and communication of environmental monitoring and assessment results; and
- Include regular progress reports on implementation.

More information can be found at: [http://www.cec.org/programs\\_projects/pollutants\\_health/smoc/](http://www.cec.org/programs_projects/pollutants_health/smoc/)



Human activities account for the majority of dioxin releases and the resulting exposure in humans and wildlife.

Dioxin levels in the environment have been declining in the United States and Canada, however, the compounds are still a source of concern for scientists because of their effects on human health and wildlife. The United States began to inventory sources of dioxins and furans in 1985, and Canada started a similar exercise in 1996. Although dioxins have not yet been measured in the Mexican environment, efforts began in 1996 to measure dioxins in source stack emissions, including cement kilns and incinerators that burn hazardous wastes.

## What is hexachlorobenzene?

Hexachlorobenzene is generated as an impurity in the manufacture of chlorinated pesticides and herbicides, and during chlorine production and other chlorination processes. It is also produced by burning municipal waste.



## Effects of dioxins and furans

Dioxins and furans are known carcinogens and have been linked to developmental, respiratory, reproductive, cardiovascular and many other disorders. They are also suspected endocrine disruptors. They have been detected in more than 100 species of invertebrates, fish, reptiles, amphibians, birds and mammals. People living in industrialized nations around the world are constantly being exposed to minute amounts of dioxins and furans through the compounds' ubiquitous presence in food, air, water and soil.

The primary exposure to dioxins and furans for humans is through consumption of food with high fat content. In Canada and the United States, over 90% of human exposure is believed to be linked to consumption of animal fat in beef, dairy products, milk, chicken, pork, fish and eggs. There are no data on exposure patterns and levels for the Mexican population.

Some groups more likely risk health effects, particularly persons who consume large amounts of contaminated fish and workers exposed to elevated concentrations through occupational scenarios including accidents.

## Effects of hexachlorobenzene

HCB is a probable human carcinogen. It is toxic when inhaled, absorbed through the skin (through contact with contaminated soil) or ingested. Short-term, high or acute exposures can lead to kidney and liver damage, central nervous effects, including seizures, circulatory collapse and respiratory depression, and death. It has also been linked to spontaneous abortions in humans. Animal studies have found low-level, long-term exposure is linked to fetal damage, cancer, kidney and liver problems.

The primary exposure to hexachlorobenzene for humans is through consumption of food. Canadians and Americans appear to be exposed at very low concentrations, primarily by eating dairy products and to a lesser extent, meat, poultry and fish. No data is available on Mexican exposure to HCB.

Although dioxins have not yet been measured in the Mexican environment, efforts began in 1996 to measure dioxins in source stack emissions, including cement kilns and incinerators that burn hazardous wastes.



Commission for Environmental Cooperation of North America  
393, rue St-Jacques Ouest, bureau 200, Montréal (Québec) Canada H2Y 1N9  
Tel: (514) 350-4300  
Fax: (514) 350-4314  
[info@ccemtl.org](mailto:info@ccemtl.org) • [www.cec.org](http://www.cec.org)