DIOXIN

A CAUSE FOR CONCERN?

UNIVERSITY OF WISCONSIN

SEA GRANT INSTITUTE

DIOXIN

A Cause for Concern?

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Dioxin: A Cause for Concern?
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INTRODUCTION

For more than a decade, the University of Wisconsin Sea Grant Institute has been a leader in research on contaminant problems in the Great Lakes region. Building on the expertise gained from past research on DDT and PCBs, UW Sea Grant scientists are now studying another group of chemical contaminants, dioxins, which are causing alarm in several parts of the U.S.

There are conflicting reports in the public media regarding the danger to people posed by dioxins, particularly 2,3,7,8-TCDD -- which is usually identified as "the most toxic chemical ever made." These stories often paint TCDD as some sort of doomsday chemical loose in the environment. Many scientists and public health officials believe such stories may be causing excessive public concern about dioxins.

The UW Sea Grant Institute has produced this booklet to help answer some of the most common questions about dioxins -- what they are, why they are a problem, whether they pose a danger to the public health, and what is being done about the problem -- in the belief that an informed approach to the dioxin problem is the best way to find the proper solution for it.

WHAT ARE DIOXINS?

The term dioxin has generally come to mean any of a family of 75 related chemical compounds known as polychlorinated dibenzo-p-dioxins (PCDDs). Dioxins are not intentionally made for any purpose; they are unavoidable byproducts created in the manufacture of other chemicals.

The nucleus of a dioxin molecule is a triple-ring structure made up of two benzene rings connected to each other by a pair of oxygen atoms. The 75 chlorinated dioxins differ only by the number and position of the chlorine atoms attached to the benzene rings. The position of the chlorine atoms on the molecule is what determines the toxicity of the dioxin.

The dioxin that is the focus of most news reports is 2,3,7,8-tetrachlorodibenzo-p-dioxin, or 2,3,7,8-TCDD. 2,3,7,8-TCDD is the most toxic of the 75 dioxins -- the one often described as the most toxic chemical ever made. As it is the most toxic dioxin compound, most studies dealing with dioxin concentrate on this particular TCDD molecule. Unless otherwise noted, TCDD in this report specifically means 2,3,7,8-TCDD. Figure 1 shows the 2,3,7,8-TCDD molecule. The numbers refer to the position on the nucleus where the chlorine atoms are attached (see figure).

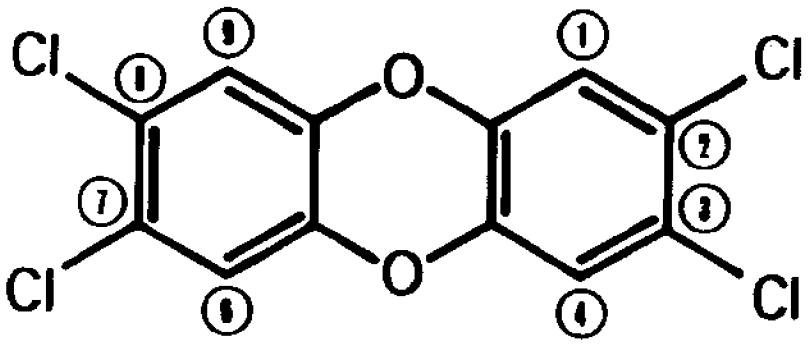

FIGURE 1: The 2,3,7,8-TCDD Molecule

WHERE DO DIOXINS COME FROM?

Dioxins are created in trace amounts during the manufacture of certain chlorinated phenolic compounds -- especially that of 2,4,5-trichlorophenol (2,4,5-TCP). 2,4,5-TCP is used as a basic ingredient in the manufacture of many other chemicals, so these chemicals also become contaminated with TCDD and other dioxins. According to U.S. Environmental Protection Agency records, in 1978 42 companies were marketing 94 commercial products containing 2,4,5-TCP. Two of these products are 2,4,5-T, a broadleaf herbicide, and hexachlorophene, an antiseptic in some prescription soaps. The pesticides Silvex, Ronnel and Erbon are also made from 2,4,5-TCP and are contaminated with dioxins.

In addition to products made from 2,4,5-TCP, dioxins have been found in related chemicals. These include pentachlorophenol, 2,4-D and hexachlorobenzene, among others.

Dioxins are also known to be formed when certain materials are burned. Municipal and industrial incinerators in particular have been found to discharge dioxins in fly ash and stack gases. The temperature at which such materials are burned is a critical factor in the formation of dioxins. If incineration temperatures are maintained above 1000^{o}C, any dioxins formed are generally destroyed. The Dow Chemical Company -- a manufacturer of 2,4,5-TCP accused of being a source of dioxins in the Tittabawasee River below its Midland, Mich., plant -- says it has evidence that dioxins are routinely formed in the burning of wood and fossil fuels.

WHY ARE DIOXINS A PROBLEM?

Like PCBs, PBBs and many similar compounds, dioxins are chlorinated hydrocarbons, which have a number of properties that make them potentially dangerous to

people. All of these compounds can contaminate the environment: They are resistant to biological breakdown and therefore may remain in the environment for years. When consumed, the compounds are not readily excreted and tend to accumulate in body fat, so they tend to become biomagnified, or concentrated, as they are passed from prey to predator on up the natural food chain to people. Dioxins are extremely toxic to some animals, and the cumulative effects of extremely small doses to both animals and humans are a major concern.

HOW DO DIOXINS GET INTO THE ENVIRONMENT?

Reports on the side-effects of Agent Orange -- a dioxin-contaminated mixture of the herbicides 2,4,5-T and 2,4-D -- have attracted almost worldwide attention to the danger of dioxins. More than 12 million gallons of Agent Orange were sprayed on the Vietnam countryside between 1962 and 1970 by the U.S. military, which used it as a defoliant to destroy vegetative cover hiding enemy troops.

Various dioxin-contaminated chemicals have been used in many common herbicides, paints, preservatives, dyes, leather-tanning agents, industrial fluids, and even the popular hospital and household cleanser hexachlorophene. In the past, the herbicides 2,4,5-T and Silvex were once used on forests, lakes, rights-of-way, pastures, ornamental turf and many other places, even home lawns. Though many uses of 2,4,5-T and Silvex have been banned in this country, more than one million pounds of these chemicals are still used each year -- on rangeland and rice fields and around airports, refineries and lumberyards.

The herbicide 2,4-D is presently being used to control weeds in cornfields and small-grain crops and in lakes. From 3,000 to 4,000 pounds of 2,4-D have been applied annually to Wisconsin lakes since 1973, according to the

state Department of Natural Resources. Nationwide, 2,4-D use is estimated to be 40-45 million pounds a year. Though trace levels of dioxins have been found in 2,4-D, it is not contaminated with TCDD.

Ronnel is an insecticide that has been used on livestock, and Erbon is a nonselective herbicide that has been used as a soil sterilant.

Pentachlorophenol is a wood preservative used in this country at a rate of 44 million pounds a year, according to the U.S. Department of Agriculture. Wood products on which this preservative is used include lumber, poles, timber and fence posts. Typical items that are treated with pentachlorophenol by homeowners and farmers include decks, siding, fences, shingles and outdoor furniture.

Given the widespread use of dioxin-contaminated chemicals and the possible dispersal of low levels of dioxin in smokestack emissions, dioxins may be expected to be found almost everywhere -- in lakes, fish, birds, mammals, soils, groundwater and in people. But wherever high levels of dioxins have been detected in the environment -- levels on the order of parts per trillion or even parts per billion -- a local herbicide application, dump site or industrial discharge has usually been implicated as the source.

WHAT EFFECTS HAVE DIOXINS HAD IN TESTS ON LABORATORY ANIMALS?

Certain dioxins can be extremely toxic to many kinds of animals. Laboratory tests of TCDD show that different species exhibit a wide range of sensitivity to this dioxin. For example, tests have shown that guinea pigs are extremely sensitive to TCDD, while hamsters are relatively insensitive. In fact, a hamster can tolerate doses of TCDD up to 5,000 times higher than that which will kill a guinea pig.

The test most often used to express the toxicity of a compound is measured in terms of the amount that kills half of the study animals in a specified time period, the 50 percent lethal dose or LD_{50} number (see Figure 2).

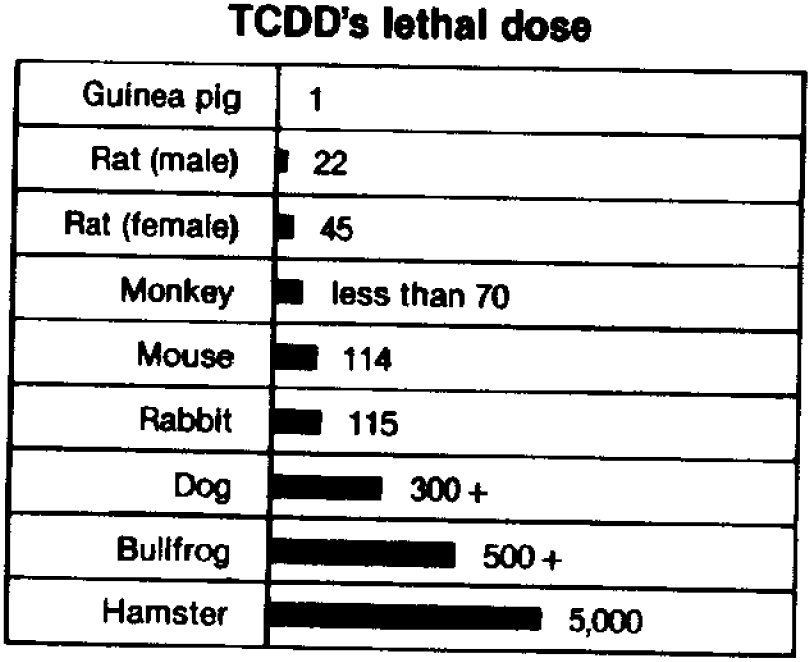

FIGURE 2: Acute LD_{50} doses of TCDD in laboratory tests on different species of animals, in micrograms per kilogram (equal to parts per billion) of body weight. (From the 1982 Review of Pharmacology and Toxicology.)

Dioxins cause several different effects simultaneously in laboratory animals, and the effects often vary from species to species. In rats, for example, TCDD apparently causes death through severe liver damage, but in guinea pigs such liver lesions are nonexistent and the animal appears to die from starvation instead. Dioxins are also suspected to be lethal to the developing fetuses of some animals and cause birth defects in other animals. It has also been shown that TCDD is an extremely potent promoter of liver cancer in rats and of skin cancer in mice.

DO DIOXINS AFFECT HUMANS?

Yes, most certainly they can -- but it is difficult to ascertain whether someone has actually been affected by dioxins. A reliable set of symptoms for diagnosing dioxin poisoning has not yet been defined, though some toxicologists believe that chloracne, a severe skin disorder, is a telltale symptom of dioxin contamination.

Since 1949, industrial accidents have exposed more than 1,000 workers to high levels of dioxins, including TCDD, and many of these workers suffered from minor liver disorders and chloracne. There have been hundreds of cases of chloracne, which shows up as circular patches of blackheads and pale yellow cysts. These acute effects seem to be reversible, though in some cases it takes years for them to go away. Individual responses to high-level dioxin exposure have not been consistent, however.

Experiments with laboratory animals have not been particularly helpful, since many symptoms of dioxin exposure are not exhibited by all species. Three symptoms that most animals exhibit are loss of lymph gland tissue, which decreases disease immunity in the young; a starvation-like loss of weight, and an enlarged or damaged liver.

There have been at least four claims that there has been an increase in spontaneous abortions and/or birth defects among people exposed to dioxins:

- The Vietnamese blame an increase in birth defects to the use of Agent Orange during the war in their country.

- Dioxin is the subject in a lawsuit against the U.S. government by 6,000 American veterans of the Vietnam War or their survivors who think the veterans or their children may have suffered from delayed effects of exposure to dioxin in Vietnam.

- Suspicion that a higher-than-normal rate of spontaneous abortions had occurred in an Oregon region sprayed with 2,4,5-T and Silvex prompted the USEPA to use its emergency powers in 1979 to ban most uses of those chemicals in the U.S.

- A segment of the general population around Seveso, Italy, was exposed to TCDD when an industrial explosion at a chemical factory released a poisonous cloud that drifted over 4,000 acres of land. Within days, hundreds of birds and small animals died, leaves began to drop from trees and residents of the area suffered from nausea and skin ailments. Because previous incidents of TCDD contamination were suspected to have affected unborn babies, more than 90 pregnant women obtained clinical abortions.

In all these cases, the evidence that dioxin caused an increase in spontaneous abortions or birth defects remains inconclusive. There is presently no strong evidence that dioxins are mutagenic -- that is, no dioxins have been found to cause genetic mutations.

CAN DIOXINS CAUSE CANCER?

There is controversial evidence that workers in two chemical plants in Michigan and West Virginia experienced an unusually high incidence of soft-tissue growths (sarcomas) as a result of exposure to TCDD. But epidemiologists disagree on these findings, since tumor development in this rare form of cancer can take more than 15 years. In that amount of time, the people involved could have been exposed to many different carcinogens.

The National Institute for Occupational Safety and Health is currently studying 7,000 chemical plant workers for increased incidence of soft-tissue sarcomas. Preliminary results support the link between this rare cancer and occupational exposure to dioxins.

WHAT LEVELS ARE DANGEROUS TO HUMANS?

Since all the recorded human exposures to dioxin-contaminated material have been accidental and at unknown levels, human sensitivity to dioxins cannot be determined from these cases. And the results of tests on laboratory animals clearly show that the toxic potency of TCDD in one species is not the same as in another species.

No one knows where humans fit into the picture -- whether they are vulnerable to extremely low levels, like the guinea pig, or can tolerate higher levels without toxic effects, like the hamster. To be on the safe side, toxicologists argue that humans should be thought of as one of the more sensitive species when determining a safe level of exposure. This is the reason for concern about even low levels of dioxin in the environment.

The Center for Disease Control has advised Missouri officials dealing with the much-publicized dioxin contamination problems there that soils and other materials containing TCDD at levels above one part per billion (ppb) should be removed from residential areas. But that does not mean levels below 1 ppb are safe -- the federal disease agency says that the 1 ppb standard is only a compromise between health concerns and a practical cleanup.

Clearly, there is much debate within the medical community as to what levels of dioxins are considered safe for humans. Most scientists and health specialists believe dioxins are generally far less toxic to humans than the public has been led to believe. No deaths have yet been attributed to dioxin exposure, and there is no hard, conclusive evidence that it causes cancer, birth defects or reproductive problems in humans. But uncertainty about the long-term effects of low-level dioxin exposure remains. Since people may be regularly exposed to trace amounts of dioxins in the environment, the U.S. government is trying to resolve this question with a wide variety of studies that may ultimately cost more than $100 million.

DO DIOXINS AFFECT FISH, LIVESTOCK AND WILDLIFE?

Less is known about the toxicity of dioxin to fish and wildlife. Laboratory studies show that TCDD suppresses growth and feeding in coho salmon, causes fin damage (necrosis) and causes skin discoloration. Reduced growth and increased mortality were also observed in a study of young rainbow trout fed a dioxin-contaminated diet. Northern pike larvae hatched from eggs exposed experimentally to TCDD at concentrations between 0.1 to 10 parts per trillion (ppt) for 96 hours exhibited growth suppression and changes in liver activity.

In the U.S., the only known accidental dioxin-caused deaths of livestock occurred in Missouri in 1971, where horse arenas sprayed with dioxin-contaminated oil sickened hundreds of horses, killing 65 of them.

Recently, research in Canada has implicated 2,3,7,8-TCDD as a contributing factor in the poor reproduction of Lake Ontario fish-eating birds in the early 1970s. Some herring gull eggs archived in 1971 contained TCDD at levels of 800 to 1,200 ppt -- the highest concentrations ever measured in the fish or wildlife of the Great Lakes region.

In early 1983, the U.S. Fish and Wildlife Service reported that TCDD was detected in two black-crowned night herons from Green Bay. These birds were first found sick in 1979, but after they died they were archived and not tested until late 1982.

Forster's tern populations around Green Bay have been declining in recent years, and there has been a high number of deformities in the young terns. Scientists suspect chemical contaminants may be involved, and there may be a dioxin link.

SHOULD I STOP EATING FISH OR WILD FOWL?

No. Most land and water environments in Wisconsin are not likely to be contaminated with unsafe levels of dioxins. However, samples of the edible portions of carp taken from the Petenwell Flowage on the Wisconsin River in 1983 were found to have 21-70 ppt TCDD, which prompted the Department of Natural Resources to suspend commercial carp fishing on the Petenwell and Castle Rock flowages of the river in July. In September, the agency also reported traces of dioxin were detected in walleye from the Upper Petenwell. However, 2,3,7,8-TCDD was not among the dioxins detected. According to the DNR, the levels and

types of dioxins in the walleye do not appear to be the kind that adversely affect human health. The DNR is also collecting fish and turtle samples from other locations around Wisconsin for testing.

Until more vigorous detection efforts are begun, the extent to which Wisconsin's waterfowl or upland game birds are contaminated with dioxin will remain unknown. New monitoring programs are being initiated, but they are costly. Testing for trace levels of dioxin can cost up to $1,500 a sample.

The U.S. Food and Drug Administration has issued the following advisory for those who may eat fish from areas known to be contaminated with dioxin:

Under 25 ppt	=	There is little cause for concern about eating the fish.
25 to 50 ppt	=	Anglers who might eat fish from contaminated areas only a few times a year should restrict their intake to no more than one meal of such fish per week. Permanent residents of these areas, who might eat contaminated fish over the course of the entire year, should not eat the fish more than one or two times a month.
Over 50 ppt	=	The fish should not be eaten.

If you do eat fish or fowl from areas known to be contaminated, follow these general guidelines: Like PCBs, dioxins tend to accumulate in the animal's body fat, so when cleaning your game, remove as much fat as possible. On waterfowl, this should include the fatty deposits and skin. On fish, remove the belly flap and the fat along the lateral and dorsal line. When cooking

wild fish or fowl, it is recommended that you avoid cooking the game in its own juices -- broil, barbecue or bake it instead. In cooking ducks, don't make gravy from the drippings.

IS IT SAFE TO SWIM AND BOAT IN DIOXIN-CONTAMINATED WATERS?

Yes. Since dioxin does not readily dissolve in water but instead attaches to particles in the water, it eventually settles to the bottom. According to the Wisconsin Division of Health, recreational activities like swimming and boating in dioxin-contaminated waters pose no threat to human health.

IN WHAT AREAS OF THE GREAT LAKES REGION ARE FISH AND WILDLIFE MOST CONTAMINATED?

The greatest problem areas identified to date are the Tittabawasee and Saginaw rivers, tributaries to Lake Huron's Saginaw Bay. The Niagara River and portions of Lake Ontario also have experienced dioxin contamination. However, only limited monitoring for dioxin contamination of fish has been done in the Great Lakes region. The majority of data available today is for TCDD, though measurements of environmental concentrations of other dioxins is now beginning. Most of the data is for fish, though the Canadians have monitored herring gull colonies on the Great Lakes for over a decade.

Table I is a condensation of TCDD monitoring data from a number of sources. The table is designed to show concentrations of TCDD in fillets and whole fish in the Great Lakes region.

TABLE I

MONITORING OF 2,3,7,8-TCDD CONTAMINATION OF FISH IN THE GREAT LAKES REGION

NUMBER OF SAMPLES	BODY OF WATER	RANGE*
125	Lake Ontario	ND-162
21	Lake Erie	ND-3
33	Lake Huron	ND-28
12	Lake Michigan	ND-5
20	Lake Superior	ND-2
1	Lake Siskiwit/Isle Royale (Lake Superior)	ND
3	Wisconsin River (Wisconsin)	21-70
2	Lower Fox River (Wisconsin)	ND
60	Saginaw Bay, Lake Huron (Michigan)	ND-69
51	Tittabawasee/Saginaw Rivers (Michigan)	ND-695
4	Grand River, Clinton County (Michigan)	8-41
34	Niagara River/Cayuga Creek (New York)	ND-87
11	Detroit River (Michigan/Ontario)	ND-2
13	Grand River (Ontario, Canada)	ND

*Concentration Range (parts per trillion)

ND = Not Detected

HOW LONG WILL DIOXINS REMAIN A PROBLEM?

Scientists don't know for sure. There is not enough long-term data to point to any specific trends. While one set of TCDD data taken from Lake Ontario has shown levels have declined since the early 1970s, many scientists suspect that, because of their similarity to PCBs, dioxins will remain an environmental problem for several decades. Here's why:

1. It appears dioxin molecules do not readily break down into other, nontoxic molecules.
2. Dioxins do not dissolve readily in water; rather, they attach to particles in the water and settle to the bottom. Once in bottom sediments, they may be recycled back into the water and food chain by bottom-feeding organisms.
3. Dioxins are heat-resistant and so are not easily destroyed by burning. In some cases, they are actually created in the burning of other materials at temperatures below 1000°C.
4. Dioxins appear to accumulate in the fat of fish and animals, and the contamination is concentrated as it moves up the food chain to top predators.
5. Since they were prevalent in many industrial products used in the past -- and some that are still being used -- dioxins most likely will continue to be released into the environment as these material are discarded. Inadequate disposal practices in the past may also mean that as waste storage barrels rust and water leaches through waste disposal sites, dioxins will wend their way into the environment.

WHAT HAS INDUSTRY DONE ABOUT THE DIOXIN PROBLEM?

In 1957, dioxins were identified as contaminants in the herbicide 2,4,5-T. Following that discovery, dioxins were found at varying degrees as a contaminant in

other commercial products, including Silvex, Erbon, 2,4-D, Ronnel, Teradifon, 2,3,4,6-tetrachlorophenol, DMPA, Sesone, pentachlorophenol and 2,4,5- and 2,4,6-trichlorophenol. All these products have pesticide applications, either as herbicides or insecticides, or both. Pentachlorophenol is a widely used wood preservative. Chlorophenols also have a variety of other uses, especially as raw materials in the synthesis of certain organic compounds.

The level of contamination and the specific dioxins in these products varied by company and production batch. In 2,4,5-T, concentrations of TCDD reached levels as high as 60 parts per million (ppm). By 1965, some companies had changed their production processes and increased quality control practices in an attempt to reduce the level of dioxin contamination. As a result, the levels of TCDD in 2,4,5-T were often lowered to about 2 ppm. As the controversy over dioxins increased, TCDD levels in 2,4,5-T were lowered even further, and some companies ceased manufacturing the controversial products altogether. By 1978, seven of 14 major producers of 2,4,5-T no longer manufactured it, and today even fewer companies make the herbicide.

Recently, Dow Chemical announced that it is funding $3 million in studies on the environmental and health effects of dioxins.

WHAT HAS GOVERNMENT DONE ABOUT THE DIOXIN PROBLEM?

In the U.S.:

* In 1970, the federal departments of Agriculture; Health, Education and Welfare, and the Interior jointly announced the suspension of many uses of the herbicide 2,4,5-T as a result of a report by the National Institute for Environmental Health Services that 2,4,5-T caused birth defects in laboratory mice. The herbicide may not be used to control weeds in lakes and rivers, crops, lawns and recreational areas. But it could still be used in applications involving forests, rights-of-way, pastures, open range land and other uses not involving crops. Because of an appeal of the ban on its use for rice crops, 2,4,5-T is still allowed for this purpose.

* In 1970, the Department of Defense halted the spraying of Agent Orange in Vietnam.

* In 1972, the U.S. Food and Drug Administration banned the use of hexachlorophene in nonprescription soaps and deodorants.

* In 1978, the Veterans Administration created the Agent Orange Registry. Its goals are to (1) identify Vietnam veterans who are concerned about possible exposure to Agent Orange, (2) provide means for Vietnam veterans to receive physical examinations and ask questions and get answers, (3) provide for follow-up services, and (4) gather information on the current health status of exposed Vietnam veterans.

* In 1979, on the basis on controversial evidence that linked forest spraying of 2,4,5-T with an increase in miscarriages among some Oregon women, the U.S. Environmental Protection Agency suspended use of

Silvex and 2,4,5-T on forests, rights-of-way and pastures, but still allowed spraying on rice fields, fence rows, vacant lots and lumberyards.

* In 1981, the U.S. Food and Drug Administration recommended that people not eat fish with dioxin levels greater than 50 parts per trillion. The USFDA also suggested that people limit their consumption of fish contaminated with 25-50 ppt dioxin. Fish with dioxin levels under 25 ppt are considered safe to eat.

* In 1981, the Center for Disease Control began a study to determine if Vietnam veterans are at a greater risk of having children with birth defects. The USFDA presently has no tolerance levels for dioxin in commercial products, and the manufacture and use of Silvex and 2,4,5-T is still legal for certain purposes. There are no regulations restricting the manufacture and use of 2,4-D.

* In 1982, the Environmental Protection Agency required some industries to certify that they are no longer using chlorophenol-type compounds as biocides (slime control agents).

* Late in 1983, the USEPA proposed a seven-tiered study to look for areas where TCDD may be present in the environment. The agency will be looking for TCDD above the 1 ppb level in areas where dioxin-contaminated products may have been manufactured, used or dumped. It also proposes to monitor industrial and municipal incinerators where dioxins may be formed. In a related effort, the agency will attempt to establish environmental background levels for TCDD in areas where dioxins are not expected to be present.

WHAT HAS GOVERNMENT DONE ABOUT THE DIOXIN PROBLEM?

In Wisconsin:

* In 1983, after TCDD was detected in two black-crowned night herons from Green Bay, the Wisconsin Department of Natural Resources tested for TCDD in fish from both the Lower Fox River and the Petenwell Flowage of the Wisconsin River. TCDD was not detected in Lower Fox River fish, but was in Wisconsin River carp. As a result, the DNR suspended commercial fishing for carp on the Petenwell and Castle Rock flowages as of July 12.

* The U.S. Fish and Wildlife Service, Wisconsin Department of Natural Resources and the University of Wisconsin Sea Grant Institute are now cooperating in a study to determine whether dioxins are a factor in the decline of Forster's tern populations nesting in the marshes of Green Bay. A large number of deformities in young terns and cormorants has led scientists to suspect that dioxin or a dioxin-like compound may be involved.

* The DNR is currently trying to identify all possible dioxin sources in the Wisconsin River basin. In addition, the agency is collecting fish and snapping turtles from 17 locations around Wisconsin to test them for dioxin contamination. The DNR also plans to check for dioxins in fish in the state's commercial fishing centers.

WHOM DO I CONTACT IF I THINK I HAVE A CONTAMINANT PROBLEM?

The first place to contact is the Wisconsin Division of Health's Bureau of Community Health and Prevention in Madison. Another place to contact is your county public health office. Also, six Wisconsin Department of Natural Resources field offices each have an environmental specialist that may be able to answer your questions. Contact the one nearest you: Southeast District Office-Milwaukee, Southern District Office-Fitchburg, West Central District Office-Eau Claire, North Central District Office-Rhinelander or Lake Michigan District Office-Green Bay. The DNR's central office in Madison has a variety of toxic substances specialists who can answer questions regarding contaminants in air, solid waste, water, fish and wildlife.

In most cases, it is best to contact local or state people because the regional offices for the U.S. Environmental Protection Agency, Food and Drug Administration, Fish and Wildlife Service, Department of Agriculture and others usually refer such questions back to the local or state offices that handle contaminant problems.

In an emergency -- especially a chemical spill -- call the state Division of Emergency Government Hotline, (608) 266-3232, and the appropriate agencies will be contacted for you. You can call collect, 24 hours a day. If for some reason you are unable to reach anyone at that number, try the federal National Response Center, (800) 424-8802, toll-free.