

THE US ENVIRONMENTAL PROTECTION AGENCY'S DIOXIN POLICIES AND PROGRAM IN 1993

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The United States Environmental Protection Agency (EPA) is the chief pollution control agency of the United States Government. The EPA operates under the authority of a number of separate environmental laws to control hazardous emissions to air, land and water. In addition EPA has programs to regulate the manufacture, sale, use, and disposal of toxic chemicals, including pesticides, and to insure the adequate cleanup of previously contaminated waste disposal sites. Dioxin is a pollutant which has received significant risk management attention under each of EPA's major authorities and programs

Dioxin is not initially produced for any commercial purpose but is rather a totally unintentional by-product. Three major classes of activities are known to result in environmental releases of dioxin. They are: the manufacture of certain chlorinated organic compounds; the chlorine bleaching of pulp and paper; and the combustion of materials containing dioxin or dioxin precursors

Chemical Manufacture: The most thoroughly studied source of dioxin contamination in the US has been the manufacture and use of certain trichlorophenol-based pesticides. The herbicide 2,4,5-T was widely used in the United States in the management of commercial forests, the clearing and maintaining of railroad and power line right-of-ways, and was a major ingredient in Agent Orange the defoliant most commonly used in the Vietnam War. In the spring of 1979, EPA placed an emergency suspension on all major uses of 2,4,5-T because of dioxin contamination and in 1983, EPA formally cancelled the herbicide's registration.

An additional problem with manufacture of dioxin contaminated chemicals like 2,4,5-T and trichlorophenol has been the disposal of their associated industrial chemical wastes. Dioxin contamination of soil and ground water through the improper disposal of chemical waste has resulted in the designation of a number of waste sites for clean up under the EPA Super Fund Program. The most notorious dioxin contaminated area has been Times Beach, Missouri, where contaminated oil

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was sprayed on roads and private properties to control dust. Contamination at Times Beach required evacuation of the area and a government purchase of the property through the EPA SuperFund program

To limit future contamination of soil and ground water from dioxin contaminated industrial hazardous waste EPA issued its "Land Ban" regulations. Under these regulations wastes formally identified as "acutely hazardous" including many which contain dioxin can no longer be deposited in hazardous waste burial facilities without proper treatment. For dioxins the only currently acceptable form of treatment is high temperature incineration

Chlorine Bleaching of Pulp and Paper: While surveying the extent of dioxin contamination from pesticide manufacturing, EPA discovered dioxin contaminated fish downstream from several pulp and paper mills. Further studies conducted jointly between EPA and the pulp and paper industry confirmed that dioxin can be formed when chlorine reacts with natural components of wood during bleached pulp manufacture. Since that discovery, EPA has proceeded to control dioxin emissions from pulp and paper plants through two parallel authorities provided in the Clean Water Act. First, working with the states, EPA has sought to limit dioxin emissions under the water permit program. Second, EPA is developing and will soon propose Effluent Guidelines that will set technology based effluent limits for dioxin and other chlorinated organics from pulp and paper mills. Since the initial discovery of dioxin in pulp mill effluents, the U.S. pulp and paper industry has initiated its own efforts in dioxin reduction and has already achieved significant reduction at many facilities.

In addition to effluents, EPA has also moved to reduce the risk to wildlife from certain methods of disposal of pulp and paper mill sludge. EPA proposed regulations in 1992 under authority of the Toxic Substances Control Act that would set limits on dioxin contamination for sludge that is used as a soil conditioner. Final action on this dioxin issue is currently under development.

Combustion: Dioxin can be a problem with combustion in two separate ways. First, there is the issue of the adequate destruction of dioxin contaminated wastes being deposited in hazardous waste incinerators. This is a limited problem since most hazardous waste incinerators do not handle dioxin-contaminated wastes. A second, and more common concern is the actual formation of dioxin during the combustion process. This occurs when wastes contain the necessary precursors for dioxin formation and the incinerator creates the proper environment for its formation. Facilities where this has been a concern include hazardous waste incinerators, municipal and medical waste incinerators, boilers and industrial furnaces, and other similar combustion operations.

EPA has established destruction efficiency standards for hazardous waste incinerators. These standards require a destruction efficiency of 99.9999%. EPA has also issued standards controlling dioxin emissions from municipal waste incinerators and from boilers and industrial furnaces (BIF). All of the limitations on combustion sources have been technology based and in most cases, the primary responsibility for implementing dioxin emissions limitations from combustion sources rests with the states.

One significant source of dioxins that has been effectively eliminated in the US is gasoline powered automobile exhausts. Prior to the EPA ban on leaded fuels (Jan. 1986), automobile engines produced dioxin as a result of incomplete combustion of gasoline additives used to control lead deposits. With the United States conversion to unleaded gasoline, these additives are no longer necessary and gasoline powered automobiles exhausts are no longer contributing dioxin to the environment at detectable levels.

Another unique but significant source of dioxin has been fires in transformers containing PCBs. If such a PCB containing transformer malfunctions and catches on fire the heat can convert some of the PCBs into dioxins and seriously contaminate surrounding structures. To control this risk, EPA has banned the use of PCBs in all new electrical equipment and has required that transformers which are used in or near commercial buildings either have their PCBs removed or have additional safety equipment be installed.

In addition to these specific actions for controlling major existing sources, EPA's Toxic Substances Program continually reviews premanufacturing notices from companies that intend to produce new chemicals. A part of this review is to examine the possibility of a new chemical containing harmful contaminants such as dioxins. If such contaminants are suspected, EPA can require the appropriate testing and if necessary limit or prevent manufacture.

Future Directions: EPA is currently engaged in a major reassessment of dioxin science. A draft of this reassessment should be ready for peer review early this fall, with a final document completed some time next summer. Accompanying EPA's reassessment of dioxin science is a parallel effort to examine EPA's dioxin policies and programs. This effort is exploring not only the policy implications of the newly emerging dioxin science but is also working to develop a more comprehensive approach to managing dioxin risks.

In the past EPA has not attempted to address dioxin risks through a coordinated, agency-wide approach. Instead, EPA has relied upon individual programs to address specific dioxin problems primarily within the confines of their individual authorities, policies and priorities. Although this approach has resulted in a significant reduction in dioxin releases, it is uncertain that this approach, by itself,

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will adequately and effectively address future dioxin concerns. For example, in the past EPA's programs only addressed dioxin sources which resulted in clear "hot spots" of environmental contamination. The Agency did not actively consider the broader question of risks to the general population from background exposure to dioxin. Aided by the scientific reassessment EPA is now working to develop an agency-wide Dioxin Strategy to guide its future dioxin risk management efforts. It is EPA's goal to complete this strategy concurrent with completion of the reassessment so that no time will be lost in incorporating the new dioxin science into all of the agency's dioxin control programs.