

4. PRODUCTION, IMPORT, USE, AND DISPOSAL

4.1 PRODUCTION

Heptachlor was first registered for use in the United States as an insecticide in 1952 and commercial production began the following year (EPA 1986a). Nearly all registered uses of heptachlor were canceled in 1974 by EPA because of its potential cancer risk and its persistence and bioaccumulation throughout the food chain (EPA 1986a). The sale of heptachlor was voluntarily canceled in 1987 by its sole U.S. manufacturer, the Velsicol Chemical Corporation. The sale, distribution, and shipment of existing stocks of all canceled chlordane and heptachlor products were prohibited in the United States as of April 1988 (EPA 1990b; SRI 1990). Heptachlor is a constituent of technical-grade chlordane, approximately 10% by weight (HSDB 1990a). Heptachlor epoxide is an oxidation product of heptachlor and of chlordane; it is not produced commercially in the United States (IARC 1979).

Table 4-1 summarizes the facilities in the United States that manufacture or process heptachlor. It also lists the maximum amounts of heptachlor that are allowed at these sites and the end uses of the heptachlor. This information is based on the release data reported to the Toxics Release Inventory (TRI) in 1988 (TM88 1990).

Heptachlor is produced commercially by the free-radical chlorination of chlordane in benzene containing from 0.5% to 5.0% of fuller's earth. The reaction is run for up to 8 hours. The chlordane starting material is prepared by the Diels-Alder condensation of hexachlorocyclopentadiene with cyclopentadiene (Sittig 1980). Technical-grade heptachlor usually consists of 72% heptachlor and 28% impurities such as trans-chlordane, cis-chlordane, and nonachlor (HSDB 1990a).

The U.S. International Trade Commission (USITC) did not report the domestic production volume of heptachlor separately for the years 1981-1985 (USITC 1982b, 1983b, 1984b, 1985, 1986). Only yearly totals were reported for all cyclic insecticides. The USITC reports production volume data only for chemicals for which three or more manufacturers report volumes that exceed certain minimum output levels.

4.2 IMPORT/EXPORT

The USITC did not report separate import data for heptachlor for the years 1981, 1982, and 1983 (USITC 1982a, 1983a, 1984a). The U.S. Department of Commerce did not report separate importation data for heptachlor for the year 1985 (USDOC 1986). The sale, distribution, and shipment of existing stocks of all canceled heptachlor products were prohibited by EPA in 1988 (EPA 1990b). No information was located that provided specific information about heptachlor or heptachlor epoxide importation following the 1988 ban.

No information was located regarding the exportation of heptachlor or heptachlor epoxide.

4.3 USE

Heptachlor is a persistent dermal insecticide with some fumigant action. It is nonphytotoxic at insecticidal concentrations (Worthing and Walker 1987). Heptachlor was used extensively from 1953 to 1974 as a soil and seed treatment to protect corn, small grains, and sorghum from pests. It was used *to control* ants, cutworms, maggots, termites, thrips, weevils, and wireworms in both cultivated and uncultivated soils. Heptachlor was also used nonagriculturally during this time period to control termites and household insects (EPA 1986a; Worthing and Walker 1987).

TABLE 4-1. Facilities That Manufacture or Process Heptachlor^a

| Facility | Location ^b | Range of maximum amounts on site in pounds | Activities and uses |
|-------------------------|-----------------------|--|---------------------|
| Velsicol Chemical Corp. | Memphis, TN | 10,000-99,999 | Produce |

^aDerived from TRI88 (1990)

^bPost office state abbreviations used

4. PRODUCTION, IMPORT, USE, AND DISPOSAL

EPA proposed cancellation of nearly all registered uses of heptachlor in 1974 because of its potential cancer risk and its persistence and bioaccumulation throughout the food chain. The few uses that were not canceled in 1974, treatment of field corn, seed (for corn, wheat, oats, barley, rye, and sorghum), citrus, pineapple, and narcissus bulbs, were phased out gradually over a 5-year period ending on July 1, 1983 (EPA 1986a). Certain uses of heptachlor were specifically exempted from EPA's suspension and cancellation actions because they were believed to result in insignificant exposure and, consequently, insignificant risk. Registrations were retained for subsurface termite control, fire ant control in buried cable closures, and dipping of roots or tops of nonfood plants (a use subsequently canceled voluntarily by the registrant, Velsicol Chemical Corporation) (EPA 1986a).

In 1988, EPA prohibited the sale, distribution, and shipment of existing stocks of all canceled chlordane and heptachlor products. Subsequently, virtually all uses of heptachlor products were voluntarily canceled by the registrant, Velsicol Chemical Corporation (EPA 1990b). The only commercial use of heptachlor products still permitted is fire ant control in power transformers. Use of existing stocks of heptachlor-containing termiticide products in the possession of homeowners is also permitted (EPA 1990b).

4.4 DISPOSAL

Heptachlor and heptachlor epoxide are Resource Conservation and Recovery Act (RCRA) hazardous wastes and hazardous constituents (EPA 1986c); as such, they must be disposed of in secure landfills in compliance with all federal, state, and local regulations. They may also be incinerated at 1,500°F for 0.5 second for primary combustion and at 3,200°F for 1 second for secondary combustion, with adequate scrubbing of incinerator exhaust and disposal of ash (Sittig 1985).

