

4. PRODUCTION, IMPORT/EXPORT, USE, AND DISPOSAL

4.1 PRODUCTION

Table 4-1 lists the facilities in each state that manufacture or process chloroethane, the intended use, and the range of maximum amounts of chloroethane that are stored on site. There are currently 50 facilities that produce or process chloroethane in the United States. The data listed in Table 4-1 are derived from the Toxics Release Inventory (TRI) (TR196 1998). Only certain types of facilities were required to report. Therefore, this is not an exhaustive list.

The production of chloroethane in the United States has decreased as the use of leaded gasoline has been regulated. In 1960, approximately 247,000 metric tons (1 metric ton = 1,000 kg) of chloroethane were produced, while in 1988 production of chloroethane was approximately 69,000 metric tons (IARC 1991).

Companies on the TRI listed as producers of chloroethane include: Degussa Corporation and Huls America, Inc., in Theodore, AL; Monsanto Company in Muscatine, IA, and Bridgeport, NJ; Westlake Monomers Corporation in Calvert City, KY; BASF Corporation in Geismar, LA; Condea Vista Company in Westlake, LA; Dow Chemical Company in Plaquemine, LA, and Freeport, TX; Formosa Plastics Corporation in Baton Rouge, LA, and Point Comfort, TX; Georgia Gulf Corporation in Plaquemine, LA; PPG Industries in Lake Charles, LA; Vulcan Materials Company in Geismar, LA; Dow Chemical USA in Midland, MI; Dow Corning Corporation in Midland, MI; Akzo Nobel Chemicals, Inc., in Edison, NJ; Cyanamid Agricultural in Manati, PR; Lobeco Prods., Inc., in Lobeco, SC; Zeneca Specialties in Mount Pleasant, TN; Eastman Chemical Company in Longview, TX; Hoechst-Celanese in Bay City, TX; Occidental Chemical Corporation in Deer Park, TX, and Gregory, TX; Specialtychem Prods. Corporation in Marinette, WI; and OS1 Specialties, Inc., in Friendly, WV (TR196 1998).

4.2 IMPORT/EXPORT

From 1979 to 1988, chloroethane imports were significant only in 1980, 1981, and 1982. During those years, imported quantities were 1,270,5,030, and 2,325 metric tons, respectively (IARC 1991). From 1990 to 1994, US. imports of chloroethane in kilograms were 3,011,432 in 1990, 4,103,072 in 1991, 14,260 in 1992, 24 in 1993, and 0 in 1994 (NTDB 1996).

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Table 4-1. Facilities that Manufacture or Process Chloroethane

State ^a	Number of Facilities	Range of Maximum Amounts on Site in Pounds ^b	Activities and Uses ^c
AL	2	0-999	1, 5, 6
CA	1	100,000-999,999	8
CT	2	10,000-999,999	7, 8
GA	2	10,000-999,999	7, 8
IA	1	100-999	1, 5
IL	2	100,000-999,999	7, 11
KY	1	100,000-999,999	1, 3, 7
LA	10	1,000-49,999,999	1, 3, 4, 5, 6, 7, 8, 11
MI	2	10,000-999,999	1, 5, 7, 13
MO	2	1,000-999,999	2, 4, 8, 10
NJ	4	0-999,999	1, 5, 7, 13
OH	2	10,000-999,999	10, 12
PA	1	100,000-999,999	10
PR	1	0-99	1, 5
SC	2	10,000-99,999	1, 5, 7
TN	1	0-99	1, 5, 7
TX	11	0-999,999	1, 5, 6, 7, 11, 13
VA	2	10,000-999,999	7, 8
WI	1	1,000-9,999	1, 5
WV	1	100-999	1, 5

Source: TRI96 1998

a Post office state abbreviations used

b Range represents maximum amounts on site reported by facilities in each state

c Activities/Uses:

- | | |
|--------------------------|-----------------------------|
| 1. Produce | 8. Formulation Component |
| 2. Import | 9. Article Component |
| 3. Onsite use/processing | 10. Repackaging |
| 4. Sale/Distribution | 11. Chemical Processing Aid |
| 5. Byproduct | 12. Manufacturing Aid |
| 6. Impurity | 13. Ancillary/Other Uses |
| 7. Reactant | |

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From 1979 to 1988, the United States exported 8,562-13,868 metric tons, with the maximum occurring in 1986 and the minimum occurring in 1988 (IARC 1991). From 1991 to 1995, U.S. exports of chloroethane in metric tons were 11.3 in 1991, 16.8 in 1992, 15.1 in 1993, 38.1 in 1994, and 5.4 in 1995 (NTDB 1996).

4.3 USE

In the past, the single largest use of chloroethane was in the production of tetraethyl lead. As recently as 1984, 80% of the chloroethane consumed in the United States was used in domestic production of tetraethyl lead, 15% was used in the production of ethyl cellulose, and 5% was used for miscellaneous applications including use as a solvent, refrigerant, and topical anesthetic, and use in the manufacture of dyes, chemicals, and pharmaceuticals (HSDB 1997; Morris and Tasto 1979). Government-mandated reduction in the amount of lead additives used in gasoline in the United States and a shift to the use of unleaded gasoline caused a drastic reduction in the amount of chloroethane required for the production of tetraethyl lead (CMR 1982; EPA 1985; IARC 1991).

Chloroethane has been used as a pulp vitality tester in dentistry, as a medication to alleviate pain associated with insect bums, stings, and sports injuries, as an adjunct in the treatment of tinea lesions and creeping eruptions, as a test for regional anesthesia before Caesarean section, and as a counterirritant and anesthetic for relief of myofacial and visceral pain syndromes (Adriani 1986; Boume et al. 1997; Brown 1972; Ehrmann 1977; Marbach 1996; Ott 1969). Chloroethane has recently been used as a freezing agent to relieve spasms in recipient arteries in microvascular transfer (Cavadas 1996).

Chloroethane is also used as a recreational inhalant, desired for its narcotic effects. The compound is manufactured in pressurized canisters and sold specifically for inhalant abuse under names such as Ethyl Gaz, Ethyl Four Star, Black Jac, and Maximum Impact (Hersh 1991; Walker 1993).

4.4 DISPOSAL

Chloroethane is listed as a toxic substance under Section 313 of the Emergency Planning and Community Right to Know Act (EPCRA) under Title III of the Superfund Amendments and Reauthorization Act (SARA) (EPA 1998c). Disposal of wastes containing chloroethane is controlled by a number of federal regulations (see Chapter 7).

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Chloroethane may be disposed of by controlled incineration. It is recommended that chloroethane be mixed with another combustible fuel prior to incineration; however, sufficient oxygen and an adequate operating temperature are mandatory to avoid incomplete combustion resulting in the formation of phosgene. Incinerators for this compound are typically equipped with an acid scrubber to remove halo acids from the effluent gas (HSDB 1997; OHM/TADS 1998). In a study of the thermal destruction of chloroethane, the minimum temperature required for 99.99% destruction with a 1 -second residence time was 727 °C (Fisher and Koshland 1990). Among the chlorinated methanes and ethanes studied, chloroethane had the lowest temperature required for destruction. Chloroethane is also a constituent of some waste-water streams; it is susceptible to removal by air stripping (HSDB 1997). Placing chloroethane in a landfill is not recommended (HSDB 1997).