

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

### 4.1 PRODUCTION

Table 4-1 lists the facilities in each state that manufacture or process methylene chloride, the intended use, and the range of maximum amounts of methylene chloride that are stored on site. There are currently 461 facilities that reported producing or processing methylene chloride in the United States. The data listed in Table 4-1 are derived from the Toxics Release Inventory (TRI98 2000). Only certain types of facilities were required to report (461 facilities reported this type of information out of a total of 714 facilities that reported methylene chloride releases to the environment). Therefore, this is not an exhaustive list.

Methylene chloride is produced by the chlorination of methane with chlorine or by the chlorination of methanol with hydrogen chloride followed by chlorination of methyl chloride (Mannsville Chemical Products Corporation 1988). Production of methylene chloride grew steadily through the 1970s and early 1980s at about 3% each year, with a peak production of about 620 million pounds in 1984. By 1988, methylene chloride production volume had dropped due to declining demand to about 500 million pounds (Mannsville Chemical Products Corporation 1988; USITC 1989). This decline in the demand for methylene chloride was expected to continue at a rate of about 1–2% per year through 1993, as more manufacturers move toward water-based aerosol systems in anticipation of further regulation of methylene chloride (HSDB 1999; NTP 1989). In 1994, the latest year for which data are available, 403 million pounds of methylene chloride were produced (C&EN 1996). As of October 1, 1996, the International Trade Commission ceased to collect or publish annual synthetic organic chemicals data. The National Petroleum Refiners Association, which currently collects such data, does not include methylene chloride on its list of organic chemicals.

The Toxics Release Inventory (TRI98 2000) reports that methylene chloride is produced at 23 facilities in 14 states. Table 4-1 summarizes information on the U.S. companies that reported the manufacture and use of methylene chloride in 1998 (TRI98 2000). The TRI data should be used with caution since only certain types of facilities are required to report. This is not an exhaustive list.

The Stanford Research Institute (SRI 1999) reports methylene chloride production by two companies at four U.S. facilities with a total manufacturing capacity of 545 million pounds. These facilities are Dow

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**Table 4-1. Facilities that Manufacture or Process Methylene Chloride**

State <sup>a</sup>	Number of facilities reporting	Range of maximum amounts on site in thousands of pounds <sup>b</sup>	Activities and uses <sup>c</sup>
AL	12	100-999999	1,4,7,8,10,11,12,13
AR	7	1000-999999	2,3,7,10,11,12,13
AZ	5	100-999999	8,10,11,12,13
CA	23	0-9999999	2,3,4,8,9,10,11,12,13
CO	4	1000-999999	8,10,11,13
CT	8	1000-99999	2,3,10,11,12,13
DE	2	10000-99999	8,11
FL	12	100-999999	8,10,11,12,13
GA	18	0-999999	2,3,8,9,10,11,12,13
IA	10	100-999999	8,10,11,12,13
IL	23	0-9999999	1,2,3,5,7,8,9,10,11,12,13
IN	21	100-9999999	1,2,3,5,8,9,10,10,11,12,13
KS	8	100-999999	1,2,3,4,8,10,11,12,13
KY	9	100-99999	1,5,7,8,10,11,13
LA	8	1000-9999999	1,4,5,6,7,8,10,12,13
MA	10	1000-999999	2,3,8,9,10,11,12,13
MD	5	1000-99999	8,10,12,13
ME	1	1000-9999	13
MI	17	100-999999	1,2,3,4,5,7,8,10,11,12,13
MN	8	100-99999	2,3,8,11,12,13
MO	13	1000-999999	4,8,10,11,12,13
MS	11	100-999999	1,2,3,8,11,12,13
MT	1	1000-9999	12
NC	17	100-999999	1,2,4,5,7,8,10,11,12,13

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**Table 4-1. Facilities that Manufacture or Process Methylene Chloride (continued)**

State <sup>a</sup>	Number of facilities	Range of maximum amounts on site in thousands of pounds <sup>b</sup>	Activities and uses <sup>c</sup>
NE	3	1000-999999	11,13
NH	3	1000-99999	8,12,13
NJ	19	0-999999	1,2,3,4,7,8,9,10,11,12,13
NM	2	1000-99999	8,12
NV	3	100-9999	1,2,3,8,11,13
NY	14	1000-9999999	2,3,4,7,8,9,10,11,12,13
OH	17	100-9999999	2,3,7,8,10,11,12,13
OK	9	100-999999	8,10,11,13
OR	6	1000-999999	2,4,8,10,11,12,13
PA	17	1000-999999	8,9,10,11,12,13
PR	12	1000-9999999	1,2,5,6,8,9,10,11,12,13
RI	2	10000-99999	10,13
SC	14	100-999999	7,8,10,11,12,13
TN	15	100-9999999	8,9,10,11,12,13
TX	27	0-49999999	1,2,3,4,5,6,7,8,9,10,11,12,13
UT	6	1000-999999	8,10,11,12,13
VA	10	1000-999999	8,10,11,12,13
WA	10	0-99999	1,6,7,10,11,12,13
WI	14	1000-999999	1,4,5,8,10,11,12,13
WV	5	0-9999999	8,11,13

TRI98 (2000 )

<sup>a</sup>Post office state abbreviations<sup>b</sup>Data in TRI are maximum amounts on site at each facility<sup>c</sup>Activities/Uses:

- |                               |                                  |
|-------------------------------|----------------------------------|
| 1. Produce                    | 8. As a formulation component    |
| 2. Import                     | 9. As an article component       |
| 3. For on-site use/processing | 10. For repackaging only         |
| 4. For sale/distribution      | 11. As a chemical processing aid |
| 5. As a byproduct             | 12. As a manufacturing aid       |
| 6. As an impurity             | 13. Ancillary or other use       |
| 7. As a reactant              |                                  |

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Chemical Company in Freeport, Texas and Plaquemine, Louisiana; and Vulcan Materials Company in Geismar, Louisiana and Wichita, Kansas.

**4.2 IMPORT/EXPORT**

Imports of methylene chloride had been decreasing from 60 million pounds in 1985 to 25–27 million pounds in 1988–1989 (Mannsville Chemical Products Corporation 1988; NTP 1989). During 1992, the import of methylene chloride had dropped to about 15.5 million pounds, but has since increased to 30 million pounds in 1996 (NTDB 1998). Methylene chloride exports have ranged from about 60–130 million pounds over the period of 1975–1988 (Mannsville Chemical Products Corporation 1988) and ranged from about 132 to 145 million pounds over the period of 1992–1996 (NTDB 1998).

**4.3 USE**

Methylene chloride is used as a solvent in paint strippers and removers (25%), as a propellant in aerosols (25%), as a process solvent in the manufacture of drugs, pharmaceuticals, and film coatings (20%), as a metal cleaning and finishing solvent (10%), in electronics manufacturing (10%), and as an agent in urethane foam blowing (10%) (NTP 1989). Aerosol products in which methylene chloride may be found include paints, automotive products, and insect sprays. However, because of labeling regulations and concerns over health and environmental issues, the use of methylene chloride in consumer aerosol products has declined (Mannsville Chemical Products Corporation 1988). Methylene chloride was once used in hair sprays but this use was banned in 1989 (FDA 1989).

Methylene chloride is also used as an extraction solvent for spice oleoresins, hops, and for the removal of caffeine from coffee. These uses of methylene chloride are approved by the Food and Drug Administration (see Chapter 7). However, it has been reported that because of concern over residual solvent, most decaffeinator no longer use methylene chloride (Mannsville Chemical Products Corporation 1988). Methylene chloride is also approved for use as a post-harvest fumigant for grains and strawberries and as a degreening agent for citrus fruit (Hearne et al. 1990; Mannsville Chemical Products Corporation 1988; Meister 1989; NTP 1989).

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**4.4 DISPOSAL**

Methylene chloride 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 1995). Disposal of wastes containing methylene chloride is controlled by a number of federal regulations (see Chapter 7).

Methylene chloride and wastes containing methylene chloride are considered hazardous wastes and as such, are subject to handling, transport, treatment, storage, and disposal requirements as mandated by law (see Chapter 7) (IRPTC 1990; NTP 1989).

Methylene chloride wastes may be disposed of by controlled incineration (liquid injection, rotary kiln, or fluidized bed) at the appropriate temperatures. No information was found regarding the amount of methylene chloride disposed of by each incineration method. The percent removal of methylene chloride by incineration is mandated by law depending upon the quantity of methylene chloride in the waste (HSDB 1999; IRPTC 1990).

According to the Toxics Release Inventory (TRI98 2000), about 0.37 million pounds of methylene chloride were transferred to landfills and/or other treatment/disposal facilities including publicly-owned treatment works in 1998 (see Section 5.2). No information was found on disposal method trends or past disposal practices.

