4. PRODUCTION, IMPORT, USE, AND DISPOSAL

4.1 PRODUCTION

1,2-Dibromoethane is a halogenated aliphatic hydrocarbon produced when gaseous ethylene comes in contact with bromine. The mixing of ethylene and bromine is accomplished in a variety of ways. One of the more common manufacturing processes involves a liquid-phase bromination of ethylene at 35°-85°C. After the bromination of ethylene, the mixture is neutralized to free acid and then purified by distillation. Other methods of 1,2-dibromoethane formation include the hydrobromination of acetylene and a reaction of 1,2-dibromoethane with water (Fishbein 1980; HSDB 1989).

In the 1970s, production of 1,2-dibromoethane in the United States remained stable, averaging 280 million pounds per year; production peaked in 1974 at 332.1 million pounds. In 1979, the production volume averaged to 285.9 million pounds (Santodonato et al. 1985). Since then, production has consistently decreased. This decrease was primarily due to increased government regulation and restriction on products using 1,2-dibromoethane. Consequently, by 1982, the U.S. production of 1,2-dibromoethane reached a low of 169.8 million pounds (Santodonato et al. 1985). Data on production of 1,2-dibromoethane are not available after 1984.

1,2-Dibromoethane production constitutes one of the largest single uses of bromine; as a result, 1,2-dibromoethane production plants are generally located near major sources of bromine, such as in Arkansas (Fishbein 1980). Current facilities that manufacture or process 1,2-dibromoethane are listed in Table 4-l.

4.2 IMPORT/EXPORT

The U.S. import levels of 1,2-dibromoethane fluctuated between 1977 and 1981, reaching a peak in 1980 of 0.861 million pounds and a low in 1979 of 0.079 million pounds (Santodonato et al. 1985). Worldwide producers of 1,2-dibromoethane include the United Kingdom, Benelux, France, Spain, Italy, and Switzerland; collectively they produce lo-66 million pounds per year (Fishbein 1980).

A major market for U.S. 1,2-dibromoethane production has been overseas, although export levels have been declining. The U.S. export level of 1,2-dibromoethane in 1981 was 29.8 million pounds. This was substantially lower than in 1978 when the U.S. export level was 84.8 million pounds (Santodonato et al. 1985).

4.3 USE

1,2-Dibromoethane has been and is still used in a variety of ways. The main use is as an additive in leaded gasoline where 1,2-dibromoethane acts as a "scavenger" that converts lead oxides in cars to lead halides; these are

TABLE 4-1. Facilities That Manufacture or Process 1,2-Dibromoethane[a]

Facility	Location	Maximum Amount on site (lbs)	Use
Great Lakes Chemical Co. El Dorado-Main Plant	El Dorado, AR	1,000,000-9,999,999	Produce; for sale/distribution
Great Lakes Chemical Corp. South Plant	El Dorado, AR	100,000-999,999	As a reactant
Ethyl Corporation	Magnolia, AR	1,000,000-9,999,999	Produce; for sale/distribution
Texaco Ref. 7 Mktg., Inc.	Bakersfield, CA	10,000-99,999	
Exxon Co. USA. Benicia Refinery	Benicia, CA	No Data	As a formulation component
Arco Products Company Los Angeles Refinery	Carson, CA	10,000-99,999	As a formulation component
Shell Oil Company	Carson, CA	10,000-99,999	As a formulation component
Shell Oil Company	Carson, CA	10,000-99,999	As a formulation component
Chevron U.S.A. Inc.	El Segundo, CA	10,000-99,999	As a formulation component
Tosco Corporation	Martinez, CA	10,000-99,999	As a formulation component
Chevron Research Company Richmond Research Center	Richmond, CA	0-99	As a formulation component; in ancillary or other uses
Chevron U.S.A. Inc. Richmond Refinery	Richmond, CA	1,000-9,999	As a formulation component
Mobil Oil Corporation Torrance Refinery	Torrance, CA	1,000-9,999	As a formulation component
Texaco Ref. & Mktg., Inc.	Wilmington, CA	10,000-99,999	As a formulation component
Chevron U.S.A. Inc. Hawaiian Refinery	Ewa Beach, HI	100,000-999,999	As a formulation component
Shell Oil Company	Roxana, IL	10,000-99,999	As a formulation component
Rock Island Refining Corporation	Indianapolis, IN	10,000-99,999	As a formulation component
Ethyl Process Development Center	Baton Rouge, LA	100-999	As a formulation component; in repackaging
Exxon Baton Rouge Refinery	Baton Rouge, LA	100,000-999,999	As a formulation component
Alliance Refinery - Bp America	Belle Chasse, LA	100-999	As a formulation component
Tenneco Oil Company	Chalmette, LA	0-99	As a formulation component
Marathon Petroleum Company	Garyville, LA	10,000-99,999	As a formulation component
Placid Refining Company	Port Allen, LA	1,000-9,999	Import; as a formulation component
Marathon Petroleum Company	Detroit, MI	1,000-9,999	As a formulation component
Koch Refining Company	Saint Paul, MN	1,000-9,999	In ancillary or other uses
Chevron U.S.A. Inc. Pascagoula Refinery	Pascagoula, MS	100,000-999,999	As a formulation component
Du Pont Chambers Works	Deepwater, NJ	1,000,000-9,999,999	As a formulation component
Diaz Chemical Corporation	Holley, NY	10,000-99,999	As a byproduct; as a reactant

TABLE 4-1 (Continued)

Facility	Location	Maximum Amount on site (lbs)	Use
Shell Chemical Company	Belpre, OH	10,000-99,999	As a reactant
Sun Refinery And Marketing Co.	Oregon, OH	10,000-99,999	As a formulation component
Sun Refining And Marketing Co.	Tulsa, OK	1,000-9,999	As a formulation component
Kerr-Mcgee Refining Corp.	Wynnewood, OK	1,000-9,999	Import; as a formulation component
Chevron U.S.A. Inc.	Philadelphia, PA	10,000-99,999	As a formulation component
Exxon Baytown Refinery	Baytown, TX	10,000-99,999	As a formulation component
Du Pont Beaumont Works	Beaumont, TX	10,000-99,999	In re-packaging
Chevron U.S.A. Inc. El Paso Refinery	El Paso, TX	0-99	As an impurity
Ethyl Corporation Houston Plant	Pasadena, TX	100,000-999,999	As a formulation component; in repackaging
Chevron U.S.A. Inc. Port Arthur Refinery	Port Arthur, TX	10,000-99,999	As a formulation component
Diamond Shamrock Refining And Marketing Company	Sunray, TX	10,000-99,999	As a formulation component
Phillips 66 Company Sweeny Refinery And Petrochemical	Sweeny, TX	10,000-99,999	As a formulation component
Marathon Petroleum Company	Texas City, TX	10,000-99,999	As a formulation component
Diamond Shamrock Refining And Marketing Company	Three Rivers, TX	10,000-99,999	As a formulation component

[a]Derived from TRI87 1989

released more easily with engine exhaust (Fishbein 1980; Stenger 1978). In 1978, 90% of the 1,2-dibromoethane produced went into leaded gasoline for this purpose (Santodonato et al. 1985). Due to the increased regulation of leaded gasoline, the production and consumption of 1,2-dibromoethane has been and will continue to decrease in the future (Fishbein 1980; Santodonato et al. 1985).

In the 1970s and early 1980s, the second largest application of 1,2-dibromoethane was as a soil fumigant to protect against insects, pests, and nematodes in citrus, vegetable, and grain crops and as a fumigant for turf, particularly on golf courses (HSDB 1989). However, in 1984, EPA banned the use of 1,2-dibromoethane as a soil and grain fumigant, thus eliminating this market for 1,2-dibromoethane manufacturers (Santodonato et al. 1985). Currently, other minor applications include treatment of felled logs for bark beetles, termite control, control of wax moths in beehives, spot treatment of milling machinery, Japanese beetle control in ornamental plants, and as a chemical intermediate for dyes, resins, waxes, and gums (HSDB 1989).

4.4 DISPOSAL

Disposal methods of 1,2-dibromoethane fall under the general regulation for organic pesticide disposal developed by EPA. The two main methods of disposal are incineration and burial. Incineration is the preferred method; disposal by burial, in a specially designated landfill, is used only if no appropriate incineration facilities are available. All emissions of the incineration process must meet the requirements of the Clean Air Act of 1970 relating to gaseous emissions. Similarly, combustible containers of organic pesticides should be disposed of in a pesticide incinerator or be buried in a specially designated landfill. The noncombustible containers should be triple-rinsed and then returned to the manufacturer to be recycled. Residues and rinse liquids should be used in conjunction with the 1,2-dibromoethanecontaining product where possible, otherwise they should be disposed of as described above (HSDB 1989).