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National Priority Chemicals Trends Report (2004-2006)

Section 4 Trends Analyses for Specific Priority Chemicals (2004-2006): 1,2,4-Trichlorobenzene (1,2,4-TCB)

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1,2,4-Trichlorobenzene (1,2,4-TCB)

Chemical Information

Alternate Names: 1,2,4-trichlorobenzol

General Uses: 1,2,4-TCB is used as an intermediate or building block to make herbicides. It is also used as a solvent and dielectric fluid, degreaser, and lubricant.

How Much 1,2,4-TCB Was Generated?

For 2006, ten facilities reported approximately 1.4 million pounds of 1,2,4-TCB being generated; one facility reported approximately 95 percent of the national total quantity of this PC. Compared to the total quantity of 1,2,4-TCB reported for 2004 and 2005, this quantity represents a decrease of approximately 518,000 pounds and an increase of approximately 101,000 pounds, respectively (Exhibit 4.1).

Exhibit 4.1. National Generation of 1,2,4-Trichlorobenzene (2004–2006)

TRI Reporting Year	2004	2005	2006
Total Quantity of 1,2,4-TCB (pounds)	1,888,685	1,269,417	1,370,487
Number of TRI Facilities Reporting 1,2,4-TCB	17	10	10

Where Was 1,2,4-TCB Generated?

Since 2004, an alkalies and chlorine manufacturing facility in Calcasieu County, Louisiana (EPA Region 6) consistently reported generating most of the 1,2,4-TCB, including approximately 95 percent of the total quantity reported for 2006 (Exhibit 4.2). Annual fluctuations in the quantity of 1,2,4-TCB likely resulted from a combination of changes in facility production and the quantity of wastes (containing 1,2,4-TCB) from offsite sources incinerated at this facility.

Other observations concerning trends for the reported quantity of 1,2,4-TCB include:

- A nonmetallic mineral mining facility in Buckingham County, Virginia (EPA Region 3) is an aggregate manufacturer that used 1,2,4-TCB as a fuel (from offsite sources) in its onsite incinerators. Because its quantities for 2004 and 2005 were below the TRI reporting threshold, the facility did not report a quantity of this PC for these two years. The quantity of 1,2,4-TCB varies from year to year depending on the type fuel used and/or the concentration of this PC in the fuel used each year.
- A cyclic crude and intermediate manufacturing facility located in Greenup County, Kentucky (EPA Region 4) phased out the use of 1,2,4-TCB in its process and substituted it with another chemical.
- An alkalies and chlorine manufacturing facility in Marshall County, West Virginia (EPA Region 3) reported a large increase of 1,2,4-TCB for 2006.

Exhibit 4.2. Quantity of 1,2,4-Trichlorobenzene, by County (2006)

EPA Region	State	County	Quantity (pounds) of 1,2,4-TCB			Percent of Total Quantity (2006)
			2004	2005	2006	
6	LA	Calcasieu	1,500,850	1,199,452	1,300,732	94.9%
3	VA	Buckingham	0	0	43,939	3.2%
4	KY	Greenup	60,138	63,259	10,378	0.8%
3	WV	Marshall	0	339	6,943	0.5%
6	TX	Jefferson	3,350	415	3,282	0.2%
5	OH	Hamilton	4,905	4,104	2,880	0.2%
4	AL	Dale	365	400	1,340	0.1%
6	TX	Brazoria	3,128	900	844	0.1%
4	FL	Hillsborough	163	147	148	<0.1%
4	KY	Marshall	1	1	1	<0.1%
Total			1,572,900	1,269,017	1,370,487	100.0%

Which Industries Generated 1,2,4-Trichlorobenzene?

For 2006, ten facilities in eight NAICS codes reported 1,2,4-TCB (Exhibit 4.3). From 2004 to 2006, facilities (primarily one facility) in NAICS code 325181 (Alkalies and chlorine manufacturing) reported the largest quantities of 1,2,4-TCB, including approximately 95 percent for 2006 (please refer to Exhibit 3.4 to see the number of facilities that reported this PC within various quantity ranges).

Exhibit 4.3. Industry Sectors Quantities of 1,2,4-Trichlorobenzene (2004–2006)

Primary NAICS code	NAICS Code Description	Facilities Reporting (2006)	Quantity (pounds) of 1,2,4-TCB			Percent of Total Quantity (2006)
			2004	2005	2006	
325181	Alkalies and Chlorine Manufacturing	2	1,500,850	1,199,791	1,307,675	95.4%
212399	All Other Nonmetallic Mineral Mining	1	0	0	43,939	3.2%
325192	Cyclic Crude and Intermediate Manufacturing	1	60,138	63,259	10,378	0.8%
325320	Pesticide and Other Agricultural Chemical Manufacturing	1	3,744	415	3,282	0.2%
325132	Synthetic Organic Dye and Pigment Manufacturing	1	4,905	4,104	2,880	0.2%
325199	All Other Basic Organic Chemical Manufacturing	2	366	401	1,341	0.1%
325211	Plastics Material and Resin Manufacturing	1	3,128	900	844	0.1%
336611	Ship Building and Repairing	1	163	147	148	<0.1%
Total		10	1,757,878	1,269,017	1,370,487	100.0%

How Did Facilities Manage 1,2,4-Trichlorobenzene?

Exhibit 4.4 shows how facilities, by industry, managed 1,2,4-TCB in 2006.

Exhibit 4.4. Management Methods for 1,2,4-Trichlorobenzene in Industry Sectors (2006)

Primary NAICS Code	NAICS Code Description	Total PC Quantity* Reported	Quantity (pounds) of 1,2,4-TCB							
			Disposal		Energy Recovery		Treatment		Recycling	
			Onsite	Offsite	Onsite	Offsite	Onsite	Offsite	Onsite	Offsite
325181	Alkalies and Chlorine Manufacturing	1,307,675	0	0	0	2	1,299,730	7,943	2,223	5,270
212399	All Other Nonmetallic Mineral Mining	43,939	0	0	43,939	0	0	0	0	0
325192	Cyclic Crude and Intermediate Manufacturing	10,378	0	3,478	1,800	0	0	5,100	0	0
325320	Pesticide and Other Agricultural Chemical Manufacturing	3,282	82	0	0	650	0	2,550	0	0
325132	Synthetic Organic Dye and Pigment Manufacturing	2,880	0	0	0	0	0	2,880	0	0
325199	All Other Basic Organic Chemical Manufacturing	1,341	0	0	0	0	1	1,340	7	0
325211	Plastics Material and Resin Manufacturing	844	1	0	81	0	759	3	641	0
336611	Ship Building and Repairing	148	0	0	0	148	0	0	0	0
	Total	1,370,487	83	3,478	45,820	800	1,300,490	19,816	2,871	5,270

*Note: The recycled quantity is presented to provide some perspective regarding the quantity of this PC already recycled compared to the quantities that are not recycled. In this Report, we primarily focus on non-recycled quantities of PCs (PC quantity) that offer the greatest opportunities for waste minimization. The term "PC Quantity", as used in this Report, refers to quantities of PCs that are managed via disposal, treatment, and energy recovery and thus potentially available for waste minimization.

Land Disposal: Facilities disposed of only 0.3 percent of the 1,2,4-TCB generated in 2006. NAICS code 325192 (Cyclic crude and intermediate manufacturing) facilities disposed of approximately 3,500 pounds of 1,2,4-TCB.

Energy Recovery: Facilities used energy recovery, mostly onsite, to manage 3.4 percent of the 1,2,4-TCB generated. A facility in NAICS code 212399 (All other nonmetallic mineral mining) used energy recovery for 100 percent of its 1,2,4-TCB, accounted for approximately 94 percent of the total quantity used for energy recovery

Treatment: Facilities treated, mostly onsite, approximately 96 percent of the 1,2,4-TCB generated in 2006. Facilities in 6 of the 8 industries used treatment as their primary method for managing this PC.

Recycling: Facilities recycled approximately 8,000 pounds of 1,2,4-TCB in 2006; a facility in NAICS code 325181(Alkalies and chlorine manufacturing), located in West Virginia, accounted for approximately 92 percent of this total.

Data Derived From Hazardous Waste Biennial Reports For 1,2,4-Trichlorobenzene

In this section, we present data on which facilities submitted information to the BR system. As discussed in Section 1, we caution readers against making casual one-to-one comparisons between the TRI and BR data. The differences between these two reporting systems can cause significant variation in the number of reporting facilities and quantities of chemicals reported.

Exhibit 4.5 shows the estimated quantity of 1,2,4-TCB contained in hazardous wastes generated in 2005—derived from data reported by facilities in the BR. We estimate that hazardous wastes reported by facilities in these industries contained approximately 413,000 pounds of 1,2,4-TCB. Waste streams classified as non-wastewaters contained approximately 99.7 percent of the 1,2,4-TCB generated. Facilities in NAICS code 325199 (All Other Basic Organic Chemical Manufacturing) accounted for approximately 94 percent of the estimated quantity of 1,2,4-TCB in the hazardous waste streams.

Exhibit 4.5. Estimated Quantity of 1,2,4-trichlorobenzene in Primary Generation Hazardous Waste, by NAICS Code (2005)

Primary NAICS Code	NAICS Code Description	Number of Facilities	Quantity (pounds) of 1,2,4-TCB			Percent of Total Quantity
			Non-wastewaters	Wastewaters	Total Quantity	
325199	All Other Basic Organic Chemical Manufacturing	5	387,097	1,341	388,437	94.0%
325181	Alkalies and Chlorine Manufacturing	4	13,863	0	13,863	3.4%
325110	Petrochemical Manufacturing	3	5,574	0	5,574	1.3%
325211	Plastics Material and Resin Manufacturing	2	4,352	0	4,352	1.1%
424610	Plastics Materials and Basic Forms and Shapes Merchant Wholesalers	1	1,154	0	1,154	0.3%
325131	Inorganic Dye and Pigment Manufacturing	1	31	0	31	<0.1%
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring	1	23	0	23	<0.1%
334510	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	1	3	0	3	<0.1%
334112	Computer Storage Device Manufacturing	1	2	0	2	<0.1%
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	1	0	<1	<1	<0.1%
	Total	20	412,098	1,341	413,439	100.0%