United States
Environmental Protection
Agency

EPA530-R-10-011
October 2010

National Priority Chemicals Trends Report (2005-2007)

Section 4
Trends Analyses for Specific Priority Chemicals (2005-2007): Naphthalene

Program Implementation and Information Division
Office of Resource Conservation and Recovery
U.S. Environmental Protection Agency

Contact Information:

Bill Kline, Senior Data Analyst
Information Collection & Analysis Branch
(540) 341-3631
kline.bill@epa.gov

Tammie Owen, Data Analyst
Information Collection & Analysis Branch
(703) 308-4044
owen.tammie@epa.gov

Dwane Young, Chief
Information Collection & Analysis Branch
(703) 347-8578
Young.dwane@epa.gov

Naphthalene

Chemical Information

Alternate Names: naphthalin, tar camphor, white tar

General Uses: Naphthalene is used to make products, such as mothballs, dyes, leather goods, and insecticides.

How Much Naphthalene Was Generated?

For 2007, 644 facilities reported approximately 12.1 million pounds of naphthalene being generated. Two facilities accounted for approximately 22 percent of the national total quantity of this PC, while 33 facilities accounted for approximately 70 percent (please refer to Exhibit 3.4 to see the number of facilities that reported this PC within various quantity ranges). Compared to the total quantities of naphthalene reported for 2005 and 2006, the quantity decreased by approximately 5.2 million pounds and decreased by approximately 2.1 million pounds, respectively (Exhibit 4.53).

Exhibit 4.53. National Generation of Naphthalene (2005−2007)

TRI Reporting Year	2005	2006	2007
Total Quantity of Naphthalene (pounds)	17,232,309	14,143,706	12,071,587
Number of TRI Facilities Reporting Naphthalene	639	640	644

Where Was Naphthalene Generated?

For 2007, facilities in 53 states and territories reported naphthalene being generated. Exhibit 4.54 shows the counties in which facilities reported approximately 80 percent of the total quantity of naphthalene generated. Some observations concerning the quantity of naphthalene reported by facilities in these counties are:

- A petroleum refinery in Jefferson County, Texas (EPA Region 6) reported a decrease of approximately 2.6 million pounds for 2006, attributing the decrease to a project that recycles dewatered wastewater sludge, containing naphthalene, into coke drums rather than land dispose of the sludge.
- A cyclic crude and intermediate manufacturing facility in Harris County, Texas (EPA Region 6) reported decreases of approximately 517,000 pounds and 1.2 million pounds for 2006 and 2007, respectively that likely resulted from substituting a cleaner feedstock.
- A petrochemical manufacturing facility in Wayne County, Michigan (EPA Region 5) reported approximately 758,000 pounds for 2006 as a result of activities associated with shutdown and cleanup operations, including residuals from tank cleanouts. The facility began shutdown and cleanup operations in May 2004 and completed the shutdown 2006.
- A petroleum refinery in Galveston County, Texas (EPA Region 6) reported a decrease of approximately 435,000 pounds for 2006.
- An inorganic chemical manufacturing facility in Jefferson County, Texas (EPA Region 6) reported decreases of approximately 132,000 pounds and 283,000 pounds for 2006 and 2007, respectively. This facility sells excess incinerator capacity to off-site generators and noted that quantities of naphthalene reported are due to the variability in the concentration of this PC in wastes received from off-site generators.
- A petroleum refinery in St. Charles County, Louisiana (EPA Region 6) reported a decrease of approximately 183,000 pounds for 2006.
- A petroleum refinery in Calcasieu County, Louisiana (EPA Region 6) reported increases of 90,000 pounds and 410,000 pounds for 2006 and 2007, respectively. The facility noted they changed how to calculate the destruction efficiency for material that was sent to the flare. The facility previously used emissions data; now they are calculating quantities based on streams going to flares.
- A petrochemical manufacturing facility in Custer County, Oklahoma (EPA Region 6) reported approximately 343,000 pounds for 2007. This facility took over the closed refinery and conducted cleanup activities; naphthalene was contained in tank bottoms.

- A pesticide and other agricultural chemical manufacturing facility in Kanawha County, West Virginia (EPA Region 3) reported an increase of approximately 229,000 pounds for 2006.
- A metal coating facility in Hancock County, Indiana (EPA Region 5) reported an increase of approximately 620,000 pounds for 2006, followed by a decrease of approximately 260,000 pounds for 2007. This facility's naphthalene is from paints used to paint steel coils. The quantity of naphthalene was directly related to the chemical composition of the paints used. The paint formulation was developed by the paint vendor per the end users specifications.
- A plastics material and resin manufacturing facility in Ector County, Texas (EPA Region 6) reported decreases of approximately 418,000 pounds and 166,000 pounds for 2006 and 2007, respectively. The facility noted it started selling a waste stream to another company as feedstock, thus resulting in the lower naphthalene quantities reported.
- A metal coating facility in Hancock County, Kentucky (EPA Region 4) reported an increase of approximately 241,000 pounds for 2006 due to increased production and the formulation of paints.
- A petroleum refinery in Boyd County, Kentucky (EPA Region 4) reported a decrease of approximately 149,000 pounds for 2007.
- An iron and steel pipe and tube manufacturing facility in Jefferson County, Kentucky (EPA Region 4) reported a decrease of approximately 155,000 pounds for 2007.
- A cyclic crude and intermediate manufacturing facility in Jefferson County, Alabama (EPA Region 4) reported decreases of approximately 497,000 pounds for 2006 and 74,000 pounds for 2007 as it neared completing the cleanup and cleanout of tanks in demolishing the facility.

Exhibit 4.54. Quantity of Naphthalene, for Facilities Reporting 80 Percent of Total Quantity, by County (2007)

EPA Region	State	County	Quantity (pounds) of Naphthalene			Percent of Total Quantity (2007)
			2005	2006	2007	
6	TX	Jefferson	4,545,791	1,864,797	1,726,465	14.3%
3	WV	Kanawha	703,295	932,598	957,373	7.9%
6	LA	Calcasieu	359,426	492,707	884,075	7.3%
6	LA	Iberville	100,099	527,748	586,770	4.9%
5	IN	Hancock	85,682	705,338	445,098	3.7%
4	KY	Hancock	163,970	444,903	422,318	3.5%
3	PA	Allegheny	403,823	422,033	413,822	3.4%
6	TX	Harris	2,339,697	1,694,220	376,144	3.1%
3	WV	Brooke	345,363	353,410	346,986	2.9%
6	OK	Custer	0	0	343,480	2.8%
4	MS	Hinds	275,740	333,802	334,910	2.8%
6	TX	Brazoria	201,657	445,898	318,575	2.6%
10	WA	Spokane	342,070	338,374	284,545	2.4%
4	AL	Jefferson	833,300	360,292	250,106	2.1%
5	IL	Cook	218,349	171,921	231,238	1.9%
5	IL	Madison	180,456	222,678	171,143	1.4%
6	TX	Galveston	664,105	267,797	155,419	1.3%
5	IN	Warrick	120,592	65,314	154,873	1.3%
6	LA	East Baton Rouge	147,177	106,126	131,405	1.1%
6	TX	Harrison	164,068	145,235	130,029	1.1%
7	IA	Scott	119,482	119,252	119,237	1.0%
2	NJ	Middlesex	234,010	163,278	118,977	1.0%
9	CA	San Bernardino	101,088	70,119	118,293	1.0%
6	LA	St Charles	288,201	96,649	114,598	0.9%
5	IN	Porter	106,096	123,272	113,628	0.9%
5	IN	Marion	237,319	166,741	103,855	0.9%
5	MI	Midland	189,130	137,420	103,000	0.9%
4	GA	Cobb	94,947	75,696	97,498	0.8%
6	TX	Ector	662,994	253,210	97,121	0.8%
Total			**14,227,926**	**11,100,828**	**9,650,981**	**79.9%**

Which Industries Generated Naphthalene?

For 2007, facilities in 73 different NAICS codes reported naphthalene being generated. Facilities in seven NAICS codes accounted for approximately 80 percent of the total quantity of naphthalene generated (Exhibit 4.55).

Exhibit 4.55. Industry Sectors Quantities of Naphthalene, for Facilities Reporting 80 Percent of Total Quantity (2007)

Primary NAICS code	NAICS Code Description	Facilities Reporting (2007)	Quantity (pounds) of Naphthalene			Percent of Total Quantity (2007)
			2005	2006	2007	
324110	Petroleum Refineries	117	5,375,285	2,393,056	3,156,283	26.1%
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	33	2,133,973	2,931,264	2,634,147	21.8%
325110	Petrochemical Manufacturing	30	1,726,853	1,632,070	1,336,625	11.1%
325320	Pesticide and Other Agricultural Chemical Manufacturing	10	737,713	946,212	979,314	8.1%
325199	All Other Basic Organic Chemical Manufacturing	23	707,484	556,075	876,661	7.3%
325192	Cyclic Crude and Intermediate Manufacturing	4	2,641,912	1,650,297	456,861	3.8%
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	2	342,052	338,447	284,399	2.4%
	Total	**219**	**13,665,272**	**10,447,421**	**9,724,290**	**80.6%**

How Did Facilities Manage Naphthalene?

Exhibit 4.56 shows how facilities, by industry, managed naphthalene in 2007.

Disposal: Facilities disposed of approximately 6 percent of the naphthalene generated. Facilities in NAICS code 324110 (Petroleum refineries) accounted for approximately 68 percent of the naphthalene disposed of.

Energy Recovery: Facilities used energy recovery for approximately 32 percent of the naphthalene generated; facilities in several of the industries used energy recovery as their primary method of managing naphthalene.

Treatment: Facilities used treatment, mostly on site, for approximately 63 percent of the naphthalene generated**.** Facilities in NAICS code 324110 (Petroleum refineries) and NAICS code 332812 (Metal Coating, Engraving Except Jewelry and Silverware) accounted for approximately 81 percent of the naphthalene treated.

In 2007, facilities also recycled approximately 36 million pounds of naphthalene. See Exhibit C.3 in Appendix C for additional information about the recycling of naphthalene. Facilities also released approximately 872,000 pounds of naphthalene as air emissions and surface water discharges in 2007. See Appendix D for additional information about releases of naphthalene.

Exhibit 4.56. Management Methods for Naphthalene, by Industry (NAICS Code) in 2007

Primary NAICS Code	NAICS Code Description	Total PC Quantity Reported	Quantity (pounds) of Naphthalene					
			Disposal		Energy Recovery		Treatment	
			On-site	Off-site	On-site	Off-site	On-site	Off-site
324110	Petroleum Refineries	3,156,283	6,107	361,082	51,779	29,523	2,657,131	50,661
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	2,634,147	250	27	334,929	65,621	2,229,094	4,226
325110	Petrochemical Manufacturing	1,336,625	274	53,120	520,010	77,783	511,721	173,717
325320	Pesticide and Other Agricultural Chemical Manufacturing	979,314	5	0	950,178	0	20,232	8,899
325199	All Other Basic Organic Chemical Manufacturing	876,661	68	2,607	507,350	24,972	273,275	68,389
325192	Cyclic Crude and Intermediate Manufacturing	456,861	106	118,409	0	258,619	21,272	58,455
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	284,399	0	0	283,371	1,012	0	16
	Total	**9,724,290**	**6,810**	**535,245**	**2,647,617**	**457,530**	**5,712,725**	**364,363**

Data Derived From Hazardous Waste Biennial Reports for Naphthalene

In this section, we present data about naphthalene contained in hazardous wastes, derived from information submitted by facilities in Biennial Reports under RCRA. We derived these data by applying a methodology to estimate the quantity of naphthalene contained in BR waste streams. The estimates of naphthalene contained in hazardous wastes supplement the data reported to TRI, providing a broader perspective regarding the industries that generate and manage wastes that contain naphthalene. Based on applying our methodology to the 2007 BR data, we estimate that 346 facilities in 67 NAICS codes reported hazardous wastes, virtually all non-wastewater, containing approximately one million pounds of naphthalene. Facilities in two industries: NAICS code 325199 (All Other Basic Organic Chemical Manufacturing) and NAICS code 321114 (Wood Preservation) accounted for approximately 74 percent of the total estimated quantity of naphthalene in the hazardous waste streams (Exhibit 4.57).

Exhibit 4.57. Estimated Quantity of Naphthalene in Primary Generation Hazardous Waste, by NAICS Code (2007)

Primary NAICS Code	NAICS Code Description	Number of Facilities	Quantity (pounds) of Naphthalene			Percent of Total Quantity
			Wastewaters	Non-Wastewaters	Total Quantity	
325199	All Other Basic Organic Chemical Manufacturing	8	0	497,684	497,684	50.9%
321114	Wood Preservation	54	921	220,568	221,489	22.6%
331111	Iron and Steel Mills	5	0	76,202	76,202	7.8%
324110	Petroleum Refineries	139	319	63,005	63,325	6.5%
221210	Natural Gas Distribution	1	0	52,269	52,269	5.3%
325188	All Other Basic Inorganic Chemical Manufacturing	4	0	35,952	35,952	3.7%
324199	All Other Petroleum and Coal Products Manufacturing	3	0	15,059	15,059	1.5%
	Total	**214**	**1,240**	**960,739**	**961,980**	**98.4%**

In 2007, facilities generated hazardous waste containing naphthalene in 220 counties within 48 states and territories. A facility in Brazoria County, Texas (EPA Region 6) generated an estimated 40 percent of the naphthalene contained in hazardous wastes (Exhibit 4.58).

Exhibit 4.58. States and Counties in Which Facilities Generated 98 Percent of Naphthalene Contained in Primary Generation Hazardous Waste (2007)

EPA Region	State	County	Estimated Quantity of Naphthalene Contained in Hazardous Wastes (pounds)	Percent of Total Quantity of Naphthalene Contained in Hazardous Wastes
6	TX	Brazoria	390,167	39.9%
5	IN	Marion	52,269	5.3%
6	TX	San Patricio	51,103	5.2%
6	LA	Iberville	50,348	5.1%
6	LA	Caddo	44,347	4.5%
3	WV	Hampshire	43,903	4.5%
6	LA	East Baton Rouge	36,465	3.7%
5	IN	Lake	33,811	3.5%
5	OH	Trumbull	29,451	3.0%
4	MS	Grenada	14,750	1.5%
3	PA	Allegheny	12,373	1.3%
6	TX	Harris	12,094	1.2%
9	CA	Contra Costa	9,027	0.9%
		Total	**780,109**	**79.8%**

Exhibit 4.59 shows how facilities reported managing hazardous wastes that contain naphthalene. For example, facilities incinerated hazardous wastes containing an estimated 272,000 pounds of naphthalene and reclaimed/recovered an estimated 235,000 pounds of naphthalene. See Appendix E for a full list of the BR management codes and their descriptions.

Exhibit 4.59. Methods Used to Manage Hazardous Wastes Containing Naphthalene (2007)

Management Method Group	Management Method Code Description	Quantity of Naphthalene Managed (2007)	Percent of Total Estimated Quantity of Naphthalene
Reclamation and Recovery	Other recovery or reclamation for reuse	235,016	23.6%
	Energy recovery at this site	80,930	8.1%
	Fuel blending prior to energy recovery at another site	64,235	6.4%
	Metals recovery	5,512	0.6%
	Solvents recovery	<1	<0.1%
	Reclamation and Recovery Total	**385,693**	**38.7%**
Destruction or Treatment Prior to Disposal at Another Site	Incineration	272,427	27.3%
	Stabilization or chemical fixation prior to disposal at another site	59,412	6.0%
	Other treatment	30,651	3.1%
	Sludge treatment and/or dewatering	11,044	1.1%
	Phase separation	198	<0.1%
	Chemical oxidation	93	<0.1%
	Biological treatment with or without precipitation	32	<0.1%
	Macro-encapsulation prior to disposal at another site	10	<0.1%
	Destruction or Treatment Prior to Disposal at Another Site Total	**373,867**	**37.5%**
Disposal	Landfill or surface impoundment that will be closed as landfill	146,510	14.7%
	Discharge to sewer/POTW or NPDES	913	0.1%
	Deepwell or underground injection	804	0.1%
	Land treatment or application	593	0.1%
	Disposal Total	**148,820**	**14.9%**
Transfer Off Site	Storage, bulking, and/or transfer off site	87,537	8.8%
	Transfer Off Site Total	**87,537**	**8.8%**
NA	NA	1,030	0.1%
	NA Total	**1,030**	**0.1%**
	Grand Total	**996,948**	**100.0%**