

Appendix B: Indiana Toxic Emissions Inventory

POINT SOURCES

Indiana's portion of the 2001 point source inventory was compiled in the same way as it has been for past Great Lakes Inventories. Data included in the point source inventory includes voluntarily reported source data, data from EPA's Toxics Release Inventory, and estimates made by IDEM using FIRE emission factors and information from sources criteria pollutant reports.

AREA SOURCES

The 2001 area source inventory was developed from the 1999 area source inventory. Interested parties should consult the 1999 inventory documentation for further details on how those estimates were developed. The following is a brief description of how the 2001 area source estimates were made.

Gas stations

2001 gasoline sales data were obtained from FHWA Highway Statistics (<http://www.fhwa.dot.gov/ohim/hs01/mf.htm>). The statewide change in gasoline sales from 1999 to 2001 was used to adjust 1999 estimates.

Residential and commercial fossil fuel combustion

2000 data for residential and commercial fossil fuel combustion were obtained from DOE EIA website (http://www.eia.doe.gov/emeu/states/main_in.html). The statewide change in fossil fuel (natural gas, wood, distillate oil and coal) consumption from 1999 to 2000 was used to adjust 1999 estimates. 2001 data were unavailable at the time the inventory was compiled.

Ethylene oxide sterilizers

2001 data for the number of hospital beds in the state were obtained from ISDH (http://www.in.gov/isdh/regsvcs/acc/services/2001/service_01_summary.htm). The change in the statewide number beds was used to adjust 1999 estimates for 2001.

Consumer and commercial products and architectural surface coatings

County population data for 2001 was obtained from the Indiana University Business Research Center's website (<http://www.ibrc.indiana.edu/population/2002estimates/e2002county.html>). County changes in population were used to adjust 1999 estimates to 2001. The two industrial surface coating categories estimated using population data were also adjusted accordingly.

Industrial surface coatings, auto refinishing, graphic arts and degreasing

A NAICS (North American Industry Classification System) to SIC Code crosswalk table is available from the U.S. Census Bureau's website (<http://www.census.gov/epcd/naics02/>). This table was used to identify NAICS codes for all of the SIC Codes included in the 1999 area source inventory. Employment data for NAICS were obtained from County Business Patterns

(<http://www.census.gov/prod/www/abs/cbptotal.html>). The statewide changes in each NAICS employment from 1999 to 2001 were used to adjust 1999 estimates to 2001.

Human cremations

2001 cremations by county were obtained from ISDH. The change in the number of cremations by county from 1999 to 2001 was used to estimate 2001 emissions for this category.

Dry cleaners

IDEM's Office of Air Quality keeps a database that has rolling annual perchloroethylene (perc) usage at dry cleaners. This database was accessed to obtain county totals of perc use. The data were used to recalculate county dry cleaning perc emissions.

POTWs

IDEM's Office of Water Quality provided POTW flow data for POTWs in 2001 that was used to adjust 1999 emission estimates.

Prescribed burning and forest fires

The Department of Natural Resources State Forestry Division provided information on the number of fires, acres burned and type of fuel consumed by County for 2001 and 2002. This information was used to recalculate emissions for this category using the same methodology used for the 1999 estimates.

Structural fires

Information on the national number of structure fires was obtained from the National Fire Protection Agency at (<http://www.nfpa.org/Research/NFPAFactSheets/HomeFire/HomeFire.asp>). The percentage of the state population to the national population from the U.S. Census was used to estimate the state total number of fires, and the county populations were used to estimate county activities. Fuel loading rates and emission factors from the 1999 inventory were used.

Municipal waste landfills

All municipal solid waste landfill estimates have been removed from the area source inventory and are now included in the point source inventory.

The following categories were unchanged from 1999:

Agricultural pesticides

The state total corn planted in 2001 obtained USDA's website (http://www.nass.usda.gov/in/annbul/0203/2002_03.htm) was the same as 1999, therefore no changes were made to this category.

Chromium electroplaters

A detailed source by source inventory was developed by IDEM for the 1999 inventory.

Traffic markings

INDOT informed IDEM that there was no significant change in the amount of the most common traffic markings used (white and yellow road paint), therefore 1999 estimates are assumed to be representative of 2001 emissions.

MOBILE SOURCES

Indiana used the 1999 mobile source inventory for 2001.

INFORMATION

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RESULTS

The attached tables provide a list of pollutants included in the 2001 inventory, and state and county emission estimates broken down by point, area, off-road mobile and on-road-mobile sources.

Table B-1: Indiana 2001 Statewide Air Toxics Emissions (lb/yr)

Pollutant	Point Sources	Area Sources	Non-road Mobile Sources	On-road Mobile Sources	Total Emissions
ACENAPHTHEN	37.87	3,816.40	736.14	1,715.14	6,305.55
ACENAPHTHYL	237.19	80,829.33	3,230.32	9,023.86	93,320.70
ACETALDEHYDE	190,075.79	6,808.02	1,827,326.57	1,956,450.76	3,980,661.14
ACETAMIDE		0.71			0.71
ACETONITRILE	110,939.10				110,939.10
ACETOPHENONE	16,713.63	52.20			16,765.83
ACROLEIN	61,082.66	48,021.33	315,292.53	212,360.22	636,756.73
ACRYLIC ACID	42.70	0.02			42.72
ACRYLONITRIL	12,123.41				12,123.41
ANILINE	6.25				6.25
ANTHRACENE	2,150.78	5,340.21	1,218.99	2,067.14	10,777.12
ANTIMONY	4,168.04	4.90			4,172.94
ARSENIC	29,984.91	777.20	78.99	1,119.25	31,960.35
ASBESTOS	700.00				700.00
ATRAZINE		1,199,880.00			1,199,880.00
BENZ(A)ANTHR	9,846.24	7,701.66	727.84	512.59	18,788.33
BENZ(BK)FL		0.22			0.22
BENZ(GHI)PE	795.98	1,525.69	474.52	605.27	3,401.46
BENZENE	359,854.36	1,695,418.76	2,554,157.77	9,590,463.90	14,199,894.79
BENZO(A)PYRE	7,520.15	1,543.02	296.97	311.74	9,671.89
BENZO(B)FLUO	1.58	2,287.97	257.00	341.79	2,888.34
BENZO(K)FLUO	0.43	762.91	251.43	341.79	1,356.56
BENZYL CHLOR	39,213.76				39,213.76
BERYLLIUM	2,817.12	132.72	47.22		2,997.05
BIPHENYL	2,193.98	3,735.66			5,929.64
BROMOFORM	2,184.87				2,184.87
BROMOMETH	24,903.20	1,360,190.72			1,385,093.92
BUTADIENE,13	4,710.87	2,933.61	415,484.15	1,230,272.34	1,653,400.97
CADMIUM	5,178.51	381.53	68.74		5,628.78
CARBON DISUL	37,324.60				37,324.60
CARBON TETRA	954.71	2,503.26			3,457.97
CARBONYL SUL	1,493,225.36				1,493,225.36
CHLORINE	579,906.59	390.02			580,296.61
CHLOROBENZ	3,113.77				3,113.77
CHLOROETHANE	4,799.22	49,510.93			54,310.15
CHLOROFORM	5,942.08	20,543.00			26,485.08
CHRO(VI)OXID	3,160.99				3,160.99
CHROMIUM	73,634.18	649.25	1,117.10		75,400.52
CHROMIUM III	10.10			423.85	433.95
CHROMIUM VI	4,439.74	69.02		281.74	4,790.50
CHRYSENE	14,749.25	4,653.02	207.17	268.36	19,877.80
CLACETOPHE,2	392.16				392.16
COBALT	11,418.18	57.46			11,475.64
COKE OVEN GS	472,707.07				472,707.07
COPPER	94,089.00	352.72			94,441.72
CRESOL MX IS	107,276.07				107,276.07

Pollutant	Point Sources	Area Sources	Non-road Mobile Sources	On-road Mobile Sources	Total Emissions
CRESOL,M	13,114.00				13,114.00
CRESOL,O	851.86				851.86
CRESOL,P	7,739.01				7,739.01
CUMENE	142,103.75	9,141.18			151,244.93
CYANIDE	148,979.95				148,979.95
DIBENZAHAH	1.04	1,738.89	1.84	0.02	1,741.78
DIBENZOFURAN	2,379.00				2,379.00
DIBROMOET,12	308.53	0.31			308.84
DIBUTYL PHTH	5,505.06	2,219.32			7,724.38
DICHLORETH12	4,149.65	3,637.28			7,786.93
DICLBNZ,14	185.12	477,292.13			477,477.25
DICLBNZENES	140.53				140.53
DICLETH,11-	764.97				764.97
DICLPROP,12					0.00
DICLPROPE,13	134.82	980,317.60			980,452.41
DIETHANOLAMI	304.00				304.00
DIMETH PHTHA	40,689.52				40,689.52
DIMETH SULFA	2,688.97				2,688.97
DIMETHFORMAM	26,452.02	70,141.82			96,593.84
DIMETHYLANIL	200.00				200.00
DINITRO-O-CR	1.00				1.00
DINITROPH,24	1.83				1.83
DINITRTOL,24	57.87				57.87
DIOCTYL PHTH	4,881.11	19.99			4,901.10
DIOXANE	229.82	191.25			421.07
EPICLHYDRIN	4.20				4.20
ETH ACRYLATE	1,800.26				1,800.26
ETHYLBENZENE	659,433.38	727,435.78	1,680,074.88	4,037,838.28	7,104,782.32
ETHYLENE GLY	639,504.90	134,029.61			773,534.50
ETHYLENE OXI	1,090.00	133,343.42			134,433.42
ETHYLENE THI	42.86				42.86
FLUORANTHENE	40,934.73	7,713.15	1,362.22	2,141.30	52,151.40
FLUORENE	105.12	9,152.20	2,082.70	3,580.70	14,920.71
FORMALDEHYDE	733,461.31	60,212.31	3,961,393.80	4,331,375.09	9,086,442.51
GLYCOL ETHRS	1,591,056.32	628,874.80			2,219,931.12
HCL	56,683,540.51	144,672.80			56,828,213.31
HEXAACL-1,3-C	1.00				1.00
HEXAMETHYL16	196.77				196.77
HEXANE	4,264,981.55	4,243,040.02	1,080,341.42	3,590,681.63	13,179,044.62
HEXCHLORETH	39,226.80				39,226.80
HEXCL-13-BUT	1.00				1.00
HEXCLBENZENE	165.66	0.54			166.20
HF	7,224,225.71	8.63			7,224,234.33
HYDROGEN CYA	19,551.93	339,778.74			359,330.67
HYDROQUINONE	384.62	11,209.96			11,594.58
INDN(123CDPY	3.69	7,625.49	130.32	166.83	7,926.33
ISOPHORONE	32,891.85	5,802.23			38,694.08
LEAD	151,646.11	4,000.76	39,169.71		194,816.58
LEAD OXIDE	314.18				314.18
MALEIC ANHYD	1,535.45				1,535.45

Pollutant	Point Sources	Area Sources	Non-road Mobile Sources	On-road Mobile Sources	Total Emissions
MANGANESE	281,052.37	1,028.44	1,361.09	239.89	283,681.79
MANGANESEOXI	366.07				366.07
MERCURY	7,473.29	421.77	337.58	1,266.63	9,499.27
METH CARBITO	292.66				292.66
METH ETH KET	1,646,311.71	2,591,806.21			4,238,117.92
METH HYDRAZI	9,523.35				9,523.35
METH IODIDE	1.43				1.43
METH ISOBUT	951,645.60	1,897,431.11			2,849,076.70
METH METHACR	160,607.56				160,607.56
METH TERT BU	20,112.12	64,750.16	19,414.21	1,371,489.35	1,475,765.84
METHANOL	1,180,545.28	3,969,144.93			5,149,690.21
METHENE(B)4-	31,043.16				31,043.16
METHOXYCHLOR	2.00				2.00
METHYL CHLOR	33,176.25	41,382.21			74,558.46
METHYLENE CL	2,818,350.46	1,249,571.94			4,067,922.40
NAPHTHALENE	147,585.15	673,618.42	69,228.76	234,933.47	1,125,365.80
NI(II) OXIDE	2.58				2.58
NICKEL	72,408.27	1,183.50	5,538.20	537.45	79,667.42
NITROBENZ	5.27				5.27
NITROPHENL,4	39.37				39.37
NITROPROPA,2		11.93			11.93
NITROSODIMET	0.55				0.55
NITROSOMORPH	0.55				0.55
PCBS	11.59				11.59
PCDD	4.22	1.04			5.26
PCDF	19.66	5.90			25.56
PCP	1.00				1.00
PERC	85,079.64	3,184,908.07			3,269,987.71
PHENANTHRENE	5,202.69	29,747.31	3,269.38	5,875.62	44,095.00
PHENOL	592,409.48	405.10	4,204.83		597,019.40
PHENYLENED,P	4,800.00				4,800.00
PHOSGENE	260.00				260.00
PHOSPHORUS	1,361.73				1,361.73
PTHALIC ANH	6,248.05				6,248.05
PROPIONALDEH	21,735.39		301,763.97	232,241.38	555,740.74
PRPLENE OXID	26,728.69				26,728.69
PYRENE	34.87	9,152.95	1,908.73	2,987.06	14,083.60
QUINOLINE	1,249.66				1,249.66
QUINONE	241.73				241.73
SELENIUM	77,119.72	627.01	40.62		77,787.35
STYRENE	5,052,405.26	1,942.69	109,140.32	810,499.16	5,973,987.43
TCDD,2378	0.08	0.00			0.09
TCDF,2378	1.64	0.16			1.79
TCE,111	9,906.73	5,568,370.26			5,578,276.99
TETCLET,1122	5,821.78				5,821.78
TOLUENE	4,798,688.83	13,751,198.53	7,316,939.64	27,287,180.32	53,154,007.32
TOLUENE24DII	2,835.06				2,835.06
TRICHLORETHY	1,233,352.39	2,829,046.60			4,062,398.99
TRICLBNZ,124	36.28				36.28
TRICLETH,112	565.23				565.23

Pollutant	Point Sources	Area Sources	Non-road Mobile Sources	On-road Mobile Sources	Total Emissions
TRIETHAMINE	530,121.87	5,140.53			535,262.40
TRIME-PENTAN	42,940.13	424,157.25	829,594.68	9,554,129.37	10,850,821.43
VINLIDENE CL	4.73	2,343.75			2,348.48
VINYL ACETAT	97,765.13	0.28			97,765.41
VINYL CHLOR	14,717.96				14,717.96
XYLENE,M	7,750.62	36,755.48			44,506.10
XYLENE,O	2,447.32	104,181.17	3,320.73		109,949.22
XYLENE,P	1,416.32	36,755.48			38,171.80
XYLENES ISO	4,524,171.68	12,021,846.47	6,588,922.55	15,348,954.18	38,483,894.88