

## Appendix B: Air Toxics Emissions Information, 2005

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### Introduction

This appendix describes the sources of air toxics emissions in Minnesota using data from the Minnesota air toxics emission inventory. The Minnesota Pollution Control Agency (MPCA) compiles an air toxics emission inventory every three years to correspond to the national emission inventory cycle. At this time, the most current air toxics emission inventory is for calendar year 2005. This report presents the 2005 Minnesota air toxics emission inventory data.

The air toxics emissions inventory includes three principal source categories: point, nonpoint, and mobile sources. MPCA staff estimated emissions for point source, majority categories of nonpoint sources and some mobile sources. The results for certain categories of nonpoint sources and mobile sources were obtained from EPA's 2005 or 2002 National Emission Inventories.<sup>1,2</sup> The following sections provide a brief description of source categories, emission estimation methods for point and area sources, and results for all three principal source categories.

### Point Sources

Unlike some other states, Minnesota does not have comprehensive air toxic emission inventory reporting requirements for industrial sources that go beyond the Toxics Release Inventory reporting requirements. However, for the Minnesota criteria pollutant emission inventory, the MPCA collects emission data annually from facilities that can emit more than a threshold amount of a criteria pollutant. The pollutants inventoried for the criteria pollutant inventory include: carbon monoxide, nitrogen oxides, particulate matter, particulate matter smaller than 10 microns (PM<sub>10</sub>), particulate matter smaller than 2.5 microns (PM<sub>2.5</sub>), ammonia, lead, sulfur dioxide, and volatile organic compounds.

These larger stationary sources are required to obtain a permit from the MPCA and are called point sources. Therefore, for the purpose of the Minnesota air toxics emission inventory, point sources are identified as facilities that are required to submit their annual inventories of criteria pollutants to the MPCA. According to this definition, there were a total of 2202 point sources in Minnesota in calendar year 2005. Examples of point sources include electric utilities, refineries, and manufacturing plants.

Three methods are used to estimate air toxics emissions from point sources: 1) direct reporting by facilities; 2) using emission factors; and 3) incorporating data from the Toxics Release Inventory (TRI) and the National Emission Inventory (NEI). The MPCA received 2005 air toxics emission information reported by 636 facilities, including refineries, iron ores mining, electric services/coal burning facilities, other manufacturing facilities, and facilities holding Option D air quality permits with actual VOC emissions of more than 5 tons. (These Option D facilities are mainly smaller companies using paints and primers, cleaning solvents, printing solutions, and paint thinners, and are required to track monthly hazardous air pollutant emissions.)

MPCA staff incorporated TRI emissions information for 104 facilities; including 51 facilities that do not have air emission permits. For facilities that did not directly report air toxics emissions, staff used throughput activity data from the Minnesota criteria emission inventory and emission factors to calculate emissions. (Combustion units were the principal processes for which emissions were calculated at these facilities.) As a result, staff was able to estimate emissions of one or more targeted pollutants from 1284 out of 2201 point sources for year 2005. The 2005 inventory includes point source emissions from 269 distinct standard industrial classification (SIC) codes and 399 distinct source classification codes (SCC).

## Nonpoint Sources

Nonpoint sources are stationary sources that are not required to submit criteria pollutant data to the MPCA. They are small emission sources, but collectively can release large amounts of toxic air pollutants. The categories of area sources have been determined by reviewing EPA's 1999 and 2002 Nonpoint Source NEIs for Hazardous Air Pollutants, Emission Inventory Improvement Program documents and other available information. The emission data for nonpoint sources were obtained from surveys, literature, and the submittals from facilities such as dry cleaners or halogenated solvent cleaners subject to a National Emission Standard for Hazardous Air Pollutants. There are 38 categories and 79 distinct SCCs included in the Minnesota emission inventory for area sources. Table 1 lists all these categories along with activity data and information sources.

## Mobile Sources

Mobile sources typically include any kind of vehicle or equipment with an engine burning a fuel such as gasoline, diesel, or natural gas. They are further sub-categorized to twelve types of on-road vehicles (see below) and four types of nonroad sources: airport (including aircraft and ground support equipment), locomotives, commercial marine vessels, and nonroad equipment.

The twelve vehicle types are described below.

- Light Duty Gas Vehicles
- Light Duty Gas Trucks 1 & 2
- Light Duty Gas Trucks 3 & 4
- Heavy Duty Gas Vehicles 2B thru 8B & Buses
- Light Duty Diesel Vehicles
- Light Duty Diesel Trucks 1 thru 4
- Heavy Duty Diesel Vehicles Class 2B
- Heavy Duty Diesel Vehicles Class 3, 4, & 5
- Heavy Duty Diesel Vehicles Class 6 & 7
- Heavy Duty Diesel Vehicles Class 8A & 8B
- Heavy Duty Diesel Buses (School & Transit)
- Motorcycles

There are also nine types of nonroad equipment, including:

- Agricultural Equipment
- Commercial Equipment
- Construction and Mining Equipment
- Industrial Equipment
- Lawn and Garden Equipment
- Logging Equipment
- Pleasure Craft
- Railroad Equipment
- Recreational Equipment.

For onroad mobile sources, MPCA staff used the U.S. EPA's 2005 emission estimates that were calculated from the vehicle emission modeling software, MOBILE6.2, and vehicle miles traveled data. MPCA staff collected activity data and estimated emissions for locomotives, aircraft, airport ground support equipment, and aircraft auxiliary power units. For commercial marine vessels, MPCA adjusted the 2002 commercial marine vessel emissions with port activities in 2005 and 2002. The 2002 emissions for PM<sub>10</sub> and VOC were produced by

SonomaTech, Inc. for the Central Regional Air Planning Association (CENRAP).<sup>3</sup> Air toxics emissions were speciated from PM<sub>10</sub> and VOC emissions. For all nonroad equipment, MPCA also obtained estimates from the EPA who used the NONROAD 2005 model.

## Emissions

The MPCA staff attempted to estimate emissions for about 500 target compounds, including 188 Hazardous Air Pollutants listed by EPA, pollutants in the Great Lakes regional air toxics emission inventory project, and pollutants monitored in Minnesota's outdoor air. For a complete list of the compounds in the 2005 inventory go to: <http://www.pca.state.mn.us/air/toxics/toxicsinventory.html>. However, emissions data were only available for 257 of the targeted compounds. The 287 pollutants were categorized to 180 individual and grouped compounds. For example, chromium, strontium chromate, and zinc chromate were put into the group called chromium compounds. This grouping method is also applied to dioxin congeners, individual glycol ethers, and polycyclic organic matter. Point and nonpoint sources emitted 161 and 133 out of the 180 compounds, respectively, while mobile sources emitted 56 of the 180 compounds. Table 2 shows a summary of emissions by principal source category.

Point sources contributed more than 50 percent emissions for 105 out of 180 individual and grouped compounds, dominating emissions of metal compounds. Nonpoint sources contribute more than 50 percent emissions of individual PAHs, except for acenaphthene. Emissions of acenaphthene are mainly from point sources. Nonpoint sources also emit more than half of total emissions for 44 non-metal compounds, such as atrazine, chlorobenzene, cyanide compounds, o-dichlorobenzene, methylene chloride, tetrachloroethylene, 1,1,1-trichloroethane, and trifluralin. Mobile sources are primary contributors to nine individual and grouped compounds such as 1,3-butadiene, acetaldehyde, benzene, ethylbenzene, formaldehyde, toluene, and xylenes.

On a mass basis, mobile sources (onroad and nonroad) contributed about two thirds of the total air toxics emitted in Minnesota, while nonpoint sources contributed 22 percent of the total emissions. Point sources emitted much less than other principal source categories, accounting for only 14 percent of total emissions. Figure 1 shows the contribution of point, nonpoint, onroad mobile sources, and nonroad mobile sources to the state total air toxics emissions.

A more detailed categorization of total air toxics emissions is shown in Table 3. The categorization was based on the first two digits of the Standard Industrial Classification (SIC) codes for point sources. Category names were used for area and mobile sources. Figure 2 shows the top eleven categories that each contributed more than two percent to the total emissions. The emissions of the remaining categories that had less than two percent contributions were summed to a category called "Other". The "Other" category contributed 28 percent of total air toxics emissions. Among the top eleven categories, recreational equipment emitted the most, followed by light duty gasoline vehicles and light duty gasoline trucks 1 & 2. These three categories were each responsible for more than 10 percent of total emissions.

## Limitations and Uncertainties

Although quality assurance plans are in place to ensure the best results, there are uncertainties and limitations to consider when evaluating the Minnesota air toxics emission inventory. Some limitations are common to air toxics emission inventories in all states and some are specific to Minnesota. For example, in all inventories not all pollutants are included because some emission factors are missing or emission factors are of poor quality, resulting in unrepresentative emission estimates.

There are uncertainties specific to Minnesota. First, the primary concern in the point source inventory is a lack of source-specific emission information from some facilities holding an individual total facility permit. Since

chemical species use varies from one facility to the other, the MPCA prefers to collect material usage and composition data from these facilities to estimate emissions. This is particularly important for those facilities using solvents such as in surface coating, solvent cleaning, and printing processes. Facilities with individual total facility permits are usually large, representing a majority of emissions from point sources.

However, Minnesota does not have a rule to require these point sources to report air toxics emissions. To overcome the deficiency, MPCA staff sent a letter to 477 of these facilities requesting their emissions. A total of 330 facilities responded, including refineries, large utilities, and other manufacturing facilities. The majority of non-responding facilities only had combustion processes/hot asphalt mixing processes and did not have any source-specific information. Although five taconite ore processing facilities didn't report air toxics emissions, the emission estimation methods and templates were established based on source-specific stack tests and data analyses. Air toxics emissions could be calculated with the throughput data reported to the emissions inventory. Besides facilities that were either closed or changed permit status, there are 17 facilities whose emissions could not be estimated without reporting.

Second, the MPCA recognizes that air toxics emission data reported by facilities may be based on an incorrect assumption that all purchased or used materials are emitted. Actually, in many cases, these materials largely react or are consumed in the industrial process. For example, we conducted a special QA/QC study for 4,4'-methylenediphenyl diisocyanate (MDI). The MPCA staff contacted facilities that showed MDI emissions in the 2002 EI, 2005 EI, or that showed MDI emissions in the EPA's [2002 National Emission Inventory \(NEI\)](#) to verify the emissions. As a result of this investigation, the state point source MDI emissions dropped from nearly 20 tons to three tons while the emitting sources increased from 20 to 51.

Third, MPCA staff could not estimate point source air toxic emissions for facilities with certain types of registration permits. There are 450 [Option B](#) and 865 [Option D](#) registration permit criteria emission inventory facilities in the Minnesota. These facilities do not report process level throughput data and have no source classification code (SCC) assigned to them. Without this information, staff could not estimate air toxics emissions for these facilities. Although the MPCA collected data from some Option D facilities and some other facilities may report to the Toxics Release Inventory, most of these small point sources had to be treated more generally as nonpoint sources in the 2005 emission inventory. For the 2005 emission inventory, 99 percent of the Option D facilities (261) that emitted more than five tons of VOC reported their air toxics emissions. Facilities with other types of registration permits cannot as easily provide air toxics emissions data because, unlike the Option D registration permit, their permit does not require tracking of air toxics emissions.

Fourth, uncertainties are introduced due to scarce information on control efficiencies for air toxics.

Fifth, a number of emission factors were developed using detection limits or half of the detection limits when the measurements were lower than detection limits. This approach tends to over-estimate emissions.

Sixth, activity levels for some nonpoint sources and nonroad equipment were allocated from national totals which might not represent the actual local activities.

The Minnesota air toxics emission inventory is a progressive inventory that changes over time. Its goal is to contain the most accurate emission data available at the time the inventory is compiled. A meaningful comparison of emissions between different inventory years to describe emission reduction is not possible for the following primary reasons:

1. The number of pollutants in the emission inventories has increased over the years (Figure 3);
2. The number of sources and source categories have expanded with time (Figure 4 and Figure 5); and
3. Emission estimation methods, emission factors, and activity data have changed with each inventory year.

## Information

For more information about Minnesota's air toxics inventory and other information related to air toxics in Minnesota, visit this website: <http://www.pca.state.mn.us/air/toxics/toxicsinventory.html>

Or contact:

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## References

1. E-mail List Archive for the Great Lakes Regional Toxic Air Pollutant Emissions Inventory Steering Committee. December 2007. <http://www.glin.net/lists/airtoxics/2007-12/msg00000.html>
2. *2002 National Emissions Inventory Data & Documentation*; U.S. Environmental Protection Agency, <http://www.epa.gov/ttn/chief/net/2002inventory.html> accessed in November 2006.
3. Ms. Dana Coe Sullivan, Manager, Emissions Assessment, Sonoma Technology, Inc., Personal communication via e-mail. September 2, 2004. E-mail: [Dana@SonomaTech.com](mailto:Dana@SonomaTech.com)

**Table 1. Nonpoint source categories and information sources for their activity data.**

Category Name	Sub-Category Name	Emission Estimation Method	Activity Data Information Source
Agricultural Pesticide Use	Corn	Apply emission factors from EIIP to the amount of pesticide applied in each county	United States Department of Agriculture & Minnesota Department of Agriculture
	Soybeans	Same as above	Same as above
	Hay	Same as above	Same as above
	Wheat	Same as above	Same as above
Animal Cremation	Livestock & Pets	Apply WebFIRE and 1999 NEI emission factors based on estimated weight of cremated animals.	Census of Agriculture and survey of pet crematoria.
Architectural Surface Coating	Architectural Surface Coating	Use per capita emission factor from 2002 NEI to estimate VOC emissions. Apply EPA's VOC speciation profiles to estimate HAP emissions.	Census data
Asphalt Paving	Cutback Asphalt	Use 2002 estimated emissions	MPCA
Autobody Refinishing	Autobody Refinishing	Use per capita emission factor from 2002 NEI to estimate VOC emissions. Apply EPA's VOC speciation profiles to estimate HAP emissions.	Census data
Commercial & Consumer Product Use	Personal Care Products	Use per capita emission factors from 2002 NEI documentation	Census data
	Household Products	Same as above	Same as above
	Automotive Aftermarket Products	Same as above	Same as above
	Coating & Related Products	Same as above	Same as above
	Adhesives & Sealants	Same as above	Same as above
	FIFRA-Regulated Products	Same as above	Same as above
	Miscellaneous	Same as above	Same as above

Category Name	Sub-Category Name	Emission Estimation Method	Activity Data Information Source
Commercial Cooking	Conveyorized Charbroiling	Update 2002 emissions based on 2005/2002 county population change	Census Data
	Under-fired Charbroiling	Same as above	Same as above
	Deep Fat Frying	Same as above	Same as above
	Flat Griddle Frying	Same as above	Same as above
Degreasing	Cold, Vapor, & In-Line Cleaning	Use 2002 NEI per employee emission factor to estimate VOC emissions. Adjust for point sources. Use VOC speciation profiles from SPECIATE to estimate HAPs.	Census data and MCEI
Dental Preparations	Volatilization of Mercury	Use state specific per capita emission factor	MPCA & Census Data
Dry Cleaning	Dry Cleaning	Use state specific emission factors based on solvent usage and machine type.	NESHAP submittals and survey letters
Fluorescent Lamp Breakage	Fluorescent Lamp Breakage	Use state specific per capita emission factor	MPCA & Census Data
Fluorescent Lamp Recycling	Fluorescent Lamp Recycling	Apportion state estimate of recycling emissions to counties based upon location of recyclers	MPCA & Census Data
Forest Wildfires	Forest Wildfires	Use 2002 U.S. EPA estimates	U.S. EPA
Gasoline Service Stations	Stage I - Submerged Fill without Control	Allocate state fuel usage to counties based on vehicle registrations. Use emission factors from WebFIRE to estimate VOC emissions. Apply 2002 NEI VOC speciation profiles to estimate HAP emissions.	Minnesota Department of Revenue & Minnesota Department of Public Safety:
	Stage I - Splash Fill	Same as above	Same as above
	Stage I - Submerged Fill with Control	Same as above	Same as above
	Stage II - Vapor Loss	Same as above	Same as above
	Stage II - Spill Loss	Same as above	Same as above

Category Name	Sub-Category Name	Emission Estimation Method	Activity Data Information Source
	Stage I - Tank Breathing	Same as above	Same as above
	Stage I - Aviation Gasoline	Allocate state fuel usage to counties based on LTOs. Use 2002 NEI emission factor to estimate VOC emissions. Apply 2002 NEI VOC speciation profiles to estimate HAP emissions.	Same as above
	Stage II - Aviation Gasoline	Same as above	Same as above
Gasoline Trucks in Transit	Gasoline Trucks in Transit	Allocate state fuel usage to counties based on vehicle registrations. Use emission factors from WebFIRE to estimate VOC emissions. Apply 2002 NEI VOC speciation profiles to estimate HAP emissions.	Minnesota Department of Revenue & Minnesota Department of Public Safety:
General Laboratory Activities	Volatilization of Mercury	Use state specific per capita emission factor	MPCA & Census Data
Grain Elevators	Grain Elevators	Apply state specific emission factor based on crop production	U.S. Department of Agriculture Data
Graphic Arts	Graphic Arts	Use per capita emission factor from 2002 NEI to calculate VOC emissions. Apply state specific speciation profiles to VOC estimates to get HAP emissions	Census Data
Hospital Sterilization	Hospital Sterilization	Use EPA's ethylene oxide emission factor based on number of hospital beds. Apply VOC emission factor based on EO emissions to estimate VOC emissions.	MPCA and Minnesota Department of Health
Human Cremation	Human Cremation	Apply WebFIRE and 1999 NEI emission factors based on estimated weight of cremated individuals.	Minnesota Department of Health
Industrial Surface Coating	General Surface Coating	Apply 2002 NEI VOC emission factor to county employee population. Use 2002 NEI speciation profiles to calculate emissions for air toxics.	Census data and MCEI



Category Name	Sub-Category Name	Emission Estimation Method	Activity Data Information Source
Mercury Volatilization	Volatilization from Dissipative Use	Use state specific per capita emission factor to calculate mercury emissions	MPCA & Census Data
	Volatilization from Spills and Land Dumping	Same as above	Same as above
	Volatilization during Solid Waste Collection/Processing	Same as above	Same as above
	Land Application of Sludge	Use emission factor based on tons of sludge produced	MPCA
	Land Application of Compost	Same as above	Same as above
Mineral Processes	Mineral Processes	Update 2002 data based on 2005/2002 state employee population change	Census Data
Municipal Solid Waste Landfills	Flaring MSW Landfill gas	Use emission factors from WebFIRE.	MPCA
	Non-flaring MSW Landfills	Use model based on AP-42, Section 2.4. Most concentrations of air toxics are obtained from MPCA landfill gas study.	MPCA
On-site Incineration	Commercial/Institutional	Use 2002 U.S. EPA estimate	U.S. EPA
Public Owned Treatment Works (POTW)	Entire Plant	Apply emission factor to throughput data	MPCA
Prescribed Burning for Forest Management	Prescribed Forest Fires	Use 2002 U.S. EPA estimate	U.S. EPA
Prescribed Burning for Rangeland	Prescribed Rangeland Fires	Use 2002 U.S. EPA estimate	U.S. EPA
Residential Fossil Fuel Combustion	Bituminous/ Subbituminous Coal	Apply emission factors from WebFIRE and 2002 NEI to the estimated fuel consumption	U.S. Department of Energy and Census Data
	Distillate Oil	Same as above	Same as above
	Natural Gas	Same as above	Same as above
	Liquified Petroleum Gas	Same as above	Same as above

Category Name	Sub-Category Name	Emission Estimation Method	Activity Data Information Source
	(LPG)		
	Kerosene	Same as above	Same as above
Residential Wood Burning	Fireplaces: General	Update 2002 data based on 2005/2002 household population change	Minnesota Department of Natural Resources & Minnesota State Demographic Center
	Fireplaces: Insert; non-EPA certified	Same as above	Same as above
	Fireplaces: Insert; EPA certified; non-catalytic	Same as above	Same as above
	Fireplaces: Insert; EPA certified; catalytic	Same as above	Same as above
	Woodstoves: General	Same as above	Same as above
	Catalytic Woodstoves: General	Same as above	Same as above
	Non-catalytic Woodstoves: EPA certified	Same as above	Same as above
Stationary Source Fuel Combustion - Commercial/Institutional	Coal Boiler	Apply emission factors from 2002 NEI & EGU documents and WebFIRE to the estimated fuel consumption	U.S. Department of Energy & MCEI
	Distillate Oil Boiler & IC Engine	Use composite emission factors based on percentage of oil throughput for each engine type. Original boiler & IC factors obtained from 2002 NEI, WebFIRE, and FIRE 6.24	Same as above
	Residual Oil Boiler	Apply emission factors from 2002 NEI & EGU documents and WebFIRE to the estimated fuel consumption	Same as above
	Natural Gas Boiler	Apply emission factors from 2002 NEI and WebFIRE to the estimated fuel consumption	Same as above

Category Name	Sub-Category Name	Emission Estimation Method	Activity Data Information Source
	LPG Boiler	Apply emission factors from 2002 NEI & EGU documents and WebFIRE to the estimated fuel consumption	Same as above
	Kerosene Boiler	Same as above	Same as above
Stationary Source Fuel Combustion - Industrial	Coal Boiler	Apply emission factors from 2002 NEI & EGU documents and WebFIRE to the estimated fuel consumption	U.S. Department of Energy & MCEI
	Distillate Oil Boiler & IC Engine	Use composite emission factors based on percentage of oil throughput for each engine type. Original boiler & IC factors obtained from 2002 NEI, WebFIRE, and FIRE 6.24	Same as above
	Residual Oil Boiler	Apply emission factors from 2002 NEI & EGU documents and WebFIRE to the estimated fuel consumption	Same as above
	Natural Gas Boiler	Apply emission factors from 2002 NEI and WebFIRE to the estimated fuel consumption	Same as above
	LPG Boiler	Apply emission factors from 2002 NEI & EGU documents and WebFIRE to the estimated fuel consumption	Same as above
	Kerosene Boiler	Same as above	Same as above
Structure Fires	Residential Structure Fires	Use emission factors recommended by the EIIP document based on tons of material burned. Assume the average total material burned in each fire is 1.15 ton.	Minnesota Department of Public Safety
Swimming Pools	Swimming Pools	Update 2002 data based on 2005/2002 county population change	Census Data
Tank & Drum Cleaning	Tank & Drum Cleaning	Use 2002 U.S. EPA estimate	U.S. EPA
Traffic Markings	White Latex Paint	Apportion state usage data to counties based on lane miles and use state specific emission factors.	Minnesota Department of Transportation

Category Name	Sub-Category Name	Emission Estimation Method	Activity Data Information Source
	Yellow Latex Paint	Same as above	Same as above
Unpaved Roads	Unpaved Roads	Use 2002 U.S. EPA estimate	U.S. EPA
Waste Disposal - Open Burning	Yard Waste - Leaf Species Unspecified	Update 2002 data based on 2005/2002 county population change	U.S. EPA
	Yard Waste - Brush Species Unspecified	Same as above	Same as above
	Land Clearing Debris	Same as above	Same as above
	Household Waste	Use state specific per capita emission factors	MPCA, survey of state residents, Census Data

\* The following link will bring you to the EPA Documentation for the Final 2002 Point Source National Emissions Inventory.  
<http://www.epa.gov/ttn/chief/net/2002inventory.html>

**Table 2. Summary of the 2005 Minnesota air toxics emissions.**

Pollutant Name	Cas No.	Emissions (lb)					Percent (%)			
		Point	Nonpoint	Onroad	Nonroad	Total	Point	Nonpoint	Onroad	Nonroad
<b>PAHs</b>										
Acenaphthene	83-32-9	9.73E+03	5.42E+03	7.22E+02	1.51E+03	1.74E+04	55.99	31.19	4.15	8.67
Acenaphthylene	208-96-8	3.93E+02	1.08E+05	3.79E+03	3.96E+03	1.16E+05	0.34	93.00	3.26	3.40
Anthracene	120-12-7	8.66E+02	8.96E+03	8.67E+02	8.52E+02	1.15E+04	7.51	77.60	7.51	7.38
Benz[a]Anthracene	56-55-3	6.63E+01	1.20E+04	2.13E+02	2.17E+02	1.25E+04	0.53	96.04	1.70	1.73
Benzo[a]Pyrene	50-32-8	1.59E+02	3.26E+03	1.31E+02	1.69E+02	3.72E+03	4.28	87.64	3.53	4.54
Benzo[b]Fluoranthene	205-99-2	1.59E+01	4.05E+03	1.44E+02	1.38E+02	4.34E+03	0.37	93.16	3.31	3.17
Benzo[g,h,i]Perylene	191-24-2	4.51E+01	4.28E+03	2.56E+02	5.75E+02	5.16E+03	0.87	83.02	4.96	11.14
Benzo[k]Fluoranthene	207-08-9	1.38E+01	1.93E+03	1.44E+02	1.27E+02	2.22E+03	0.62	87.18	6.48	5.72
Chrysene	218-01-9	5.55E+01	8.39E+03	1.14E+02	1.70E+02	8.73E+03	0.64	96.11	1.30	1.95
Dibenzo[a,h]Anthracene	53-70-3	2.85E+01	2.44E+02	6.07E-02	4.37E+00	2.77E+02	10.30	88.10	0.02	1.58
Fluoranthene	206-44-0	1.45E+02	1.32E+04	8.90E+02	1.77E+03	1.60E+04	0.90	82.53	5.55	11.02
Fluorene	86-73-7	9.12E+02	1.37E+04	1.50E+03	2.97E+03	1.91E+04	4.77	71.86	7.84	15.54
Indeno[1,2,3-c,d]Pyrene	193-39-5	1.36E+03	1.98E+03	7.18E+01	1.78E+02	3.59E+03	37.79	55.26	2.00	4.95
Naphthalene	91-20-3	3.29E+04	4.48E+05	1.07E+05	5.90E+04	6.46E+05	5.09	69.29	16.49	9.13
Phenanthrene	85-01-8	9.90E+02	4.56E+04	2.45E+03	5.80E+03	5.48E+04	1.81	83.14	4.47	10.58
Pyrene	129-00-0	2.93E+02	1.61E+04	1.24E+03	2.03E+03	1.96E+04	1.49	81.87	6.32	10.31
Total PAH		8.94E+02	8.06E+03			8.95E+03	9.99	90.01		
16-PAH		2.16E+03	6.18E+02		3.96E+00	2.78E+03	77.65	22.21		0.14
7-PAH		1.11E+02	1.09E+03		3.91E-02	1.20E+03	9.22	90.77		0.00
<b>PAH Total</b>		<b>5.11E+04</b>	<b>7.05E+05</b>	<b>1.19E+05</b>	<b>7.94E+04</b>	<b>9.55E+05</b>	<b>5.36</b>	<b>73.84</b>	<b>12.48</b>	<b>8.32</b>
<b>Metal Compounds</b>										
Antimony	7440-36-0	2.29E+03	9.90E+01		2.05E+01	2.41E+03	95.05	4.10		0.85
Arsenic	7440-38-2	1.46E+04	3.52E+02	2.79E+02	5.89E+02	1.59E+04	92.30	2.22	1.76	3.71
Beryllium	7440-41-7	4.31E+02	6.51E+01		4.94E+01	5.45E+02	79.00	11.95		9.05
Cadmium	7440-43-9	1.92E+03	4.16E+02		5.06E+01	2.39E+03	80.47	17.41		2.12
Chromium	7440-47-3	1.45E+04	5.80E+02	4.67E+02	4.02E+01	1.56E+04	93.03	3.72	2.99	0.26
Chromium VI	18540-29-9	1.65E+03	4.35E+01	1.03E+02	2.07E+01	1.82E+03	90.84	2.39	5.63	1.14
Cobalt	7440-48-4	5.42E+03	1.71E+02		2.35E+01	5.62E+03	96.53	3.05		0.42
Copper	7440-50-8	1.57E+04	3.77E+02		4.84E+00	1.60E+04	97.62	2.35		0.03
Lead	7439-92-1	5.81E+04	1.28E+03		1.78E+04	7.72E+04	75.31	1.66		23.03

Pollutant Name	Cas No.	Emissions (lb)					Percent (%)			
		Point	Nonpoint	Onroad	Nonroad	Total	Point	Nonpoint	Onroad	Nonroad
Manganese	7439-96-5	9.15E+04	6.40E+02	1.95E+02	5.27E+01	9.24E+04	99.04	0.69	0.21	0.06
Mercury	7439-97-6	2.92E+03	6.78E+02	1.32E+01	1.52E+00	3.62E+03	80.85	18.75	0.36	0.04
Nickel	7440-02-0	3.47E+04	2.25E+03	4.31E+02	3.63E+02	3.77E+04	91.93	5.96	1.14	0.96
Selenium	7782-49-2	6.90E+03	9.27E+02		2.31E+00	7.83E+03	88.13	11.84		0.03
<b>Metal Total</b>		<b>2.51E+05</b>	<b>7.88E+03</b>	<b>1.49E+03</b>	<b>1.90E+04</b>	<b>2.79E+05</b>	<b>89.84</b>	<b>2.82</b>	<b>0.53</b>	<b>6.81</b>
<b>Non-Metal Compounds (Excluding PAHs)</b>										
Acetaldehyde	75-07-0	3.39E+05	1.11E+06	1.70E+06	1.17E+06	4.32E+06	7.84	25.63	39.37	27.16
Acetamide	60-35-5		6.31E-01			6.31E-01		100.00		
Acetone	67-64-1	1.03E+06	7.34E+05		5.95E+04	1.83E+06	56.58	40.16		3.25
Acetonitrile	75-05-8	5.00E+03	2.06E+05			2.11E+05	2.37	97.63		
Acetophenone	98-86-2	3.89E+02	2.48E+02			6.37E+02	61.04	38.96		
Acrolein	107-02-8	1.14E+05	1.19E+05	1.12E+05	1.00E+05	4.45E+05	25.72	26.65	25.15	22.49
Acrylamide	79-06-1	5.96E+02				5.96E+02	100.0	0		
Acrylic Acid	79-10-7	2.53E+04	1.88E-02			2.53E+04	0	0.00		
Acrylonitrile	107-13-1	3.72E+03	5.93E+03			9.65E+03	38.57	61.43		
Aldehydes		8.49E+04				8.49E+04	100.0	0		
Allyl Chloride	107-05-1	1.10E+01				1.10E+01	100.0	0		
Aniline	62-53-3	9.12E-02				9.12E-02	100.0	0		
Atrazine	1912-24-9		1.94E+05			1.94E+05		100.00		
Benzaldehyde	100-52-7	2.31E+03	1.12E+05		2.61E+04	1.41E+05	1.64	79.76		18.60
Benzene	71-43-2	1.93E+05	2.83E+06	6.30E+06	2.86E+06	1.22E+07	1.58	23.22	51.73	23.47
Benzyl Chloride	100-44-7	3.62E+03	3.49E+02			3.97E+03	91.21	8.79		
Biphenyl	92-52-4	2.19E+03	9.90E+02			3.18E+03	68.91	31.09		
Dichloroethyl Ether (Bis[2-Chloroethyl]Ether)	111-44-4	9.70E-02				9.70E-02	100.0	0		
Bromoform	75-25-2	8.08E+02	1.95E+01			8.27E+02	97.65	2.35		
Methyl Bromide (Bromomethane)	74-83-9	1.59E+04	1.05E+06			1.06E+06	1.49	98.51		
1,3-Butadiene	106-99-0	4.86E+03	1.54E+05	6.61E+05	7.48E+05	1.57E+06	0.31	9.82	42.18	47.69
Butyraldehyde	123-72-8	1.52E+03			2.57E+04	2.72E+04	5.58			94.42
Carbon Disulfide	75-15-0	2.90E+03	8.44E+02			3.74E+03	77.42	22.58		

## Appendix B

## Air Quality in Minnesota: 2009 Report to the Legislature

Pollutant Name	Cas No.	Emissions (lb)					Percent (%)			
		Point	Nonpoint	Onroad	Nonroad	Total	Point	Nonpoint	Onroad	Nonroad
Carbon Tetrachloride	56-23-5	1.64E+04	7.98E+02			1.72E+04	95.37	4.63		
Carbonyl Sulfide	463-58-1	1.28E+04	6.33E+02			1.34E+04	95.28	4.72		
Catechol	120-80-9	9.38E+02				9.38E+02	100.0	0		
Trichlorofluoromethane (CFC-11, R-11)	75-69-4	1.39E+03	1.84E+03			3.23E+03	42.99	57.01		
Trichlorotrifluoromethane (CFC-113, R-113)	76-13-1	2.01E+01	1.92E+05			1.92E+05	0.01	99.99		
Chlorine	7782-50-5	2.14E+04	4.09E+05			4.31E+05	4.96	95.04		
Chloroacetic Acid	79-11-8	3.11E+02				3.11E+02	100.0	0		
Chlorobenzene	108-90-7	1.45E+03	3.39E+05			3.40E+05	0.43	99.57		
Ethyl Chloride	75-00-3	4.63E+03	1.77E+03			6.40E+03	72.30	27.70		
Chloroform	67-66-3	1.11E+04	3.97E+05			4.09E+05	2.72	97.28		
2-Chloroacetophenone	532-27-4	1.45E+02	3.49E+00			1.48E+02	97.65	2.35		
Cresol/Cresylic Acid (Mixed Isomers)	1319-77-3	2.27E+03				2.27E+03	100.0	0		
m-Cresol	108-39-4	3.25E+01				3.25E+01	100.0	0		
o-Cresol	95-48-7	5.05E+03	1.27E+02			5.18E+03	97.54	2.46		
p-Cresol	106-44-5	8.44E+02	2.58E+02			1.10E+03	76.62	23.38		
Crotonaldehyde	123-73-9	2.79E+02			2.68E+04	2.70E+04	1.03			98.97
Cumene	98-82-8	1.83E+04	2.42E+04			4.26E+04	43.06	56.94		
Cyanide Compounds	57-12-5	5.69E+04	3.92E+05			4.49E+05	12.69	87.31		
2,4-D (2,4-Dichlorophenoxyacetic Acid)	94-75-7		4.35E+04			4.35E+04		100.00		
Dibenzofuran	132-64-9	3.09E+02	1.64E+03			1.95E+03	15.89	84.11		
Ethylene Dibromide (Dibromoethane)	106-93-4	1.96E+03	2.56E+01			1.99E+03	98.71	1.29		
Dibutyl Phthalate	84-74-2	6.81E+03	4.25E+02			7.24E+03	94.13	5.87		
Ethylene Dichloride (1,2-Dichloroethane)	107-06-2	1.23E+04	2.52E+03			1.48E+04	83.03	16.97		
Dichlorvos	62-73-7	2.80E+02				2.80E+02	100.0	0		
1,4-Dichlorobenzene	106-46-7	2.82E+03	3.88E+05			3.90E+05	0.72	99.28		
M-Dichlorobenzene	541-73-1	3.19E+01	2.34E+03			2.37E+03	1.35	98.65		
O-Dichlorobenzene	95-50-1	3.41E+02	8.86E+02			1.23E+03	27.82	72.18		
Dichlorobenzenes	25321-22-6	7.10E+01	1.76E+02			2.47E+02	28.78	71.22		
Ethylidene Dichloride (1,1-Dichloroethane)	75-34-3	1.43E+03	1.72E+03			3.15E+03	45.28	54.72		
Cis-1,2-Dichloroethylene	156-59-2	4.61E+02				4.61E+02	100.0			

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Pollutant Name	Cas No.	Emissions (lb)					Percent (%)				
		Point	Nonpoint	Onroad	Nonroad	Total	Point	Nonpoint	Onroad	Nonroad	
							0				
Cis-1,3-Dichloropropene	10061-01-5	1.77E+02				1.77E+02	100.0				
1,3-Dichloropropene	542-75-6	1.08E+02	7.51E+05			7.52E+05	0.01	99.99			
Diethyl Sulfate	64-67-5	4.00E+00				4.00E+00	100.0				
Diethanolamine	111-42-2	9.82E+02	1.90E+03			2.88E+03	34.09	65.91			
Dimethyl Phthalate	131-11-3	1.11E+04	1.40E+02			1.12E+04	98.75	1.25			
Dimethyl Sulfate	77-78-1	9.94E+02	2.40E+01			1.02E+03	97.65	2.35			
N,N-Dimethylformamide	68-12-2	4.19E+04	1.64E+02			4.21E+04	99.61	0.39			
Dimethylaniline(N,N-Dimethylaniline)	121-69-7	1.08E+02				1.08E+02	100.0				
4,6-Dinitro-o-Cresol (Including Salts)	534-52-1	2.19E-01				2.19E-01	100.0				
2,4-Dinitrophenol	51-28-5	2.27E+01				2.27E+01	100.0				
2,4-Dinitrotoluene	121-14-2	1.76E+02	1.40E-01			1.76E+02	99.92	0.08			
Bis(2-Ethylhexyl)Phthalate (Dehp)	117-81-7	4.89E+03	4.56E+02			5.34E+03	91.46	8.54			
Di-N-Octylphthalate	117-84-0	1.70E+02				1.70E+02	100.0				
p-Dioxane	123-91-1	2.20E+03	2.06E+03			4.27E+03	51.63	48.37			
Epichlorohydrin	106-89-8	1.87E+01				1.87E+01	100.0				
1,2-Epoxybutane	106-88-7	3.64E+01				3.64E+01	100.0				
Ethyl Acrylate	140-88-5	9.94E+02				9.94E+02	100.0				
Ethyl Carbamate (Urethane) Chloride (Chloroeth	51-79-6	1.55E+02				1.55E+02	100.0				
Ethylbenzene	100-41-4	2.11E+05	2.63E+05	2.26E+06	1.35E+06	4.08E+06	5.18	6.45	55.36	33.02	
Ethylene Glycol	107-21-1	1.32E+05	8.05E+05			9.37E+05	14.09	85.91			
Ethylene Oxide	75-21-8	5.24E+02	3.10E+04			3.15E+04	1.66	98.34			
Formaldehyde	50-00-0	9.90E+05	9.69E+05	2.29E+06	2.44E+06	6.68E+06	14.81	14.50	34.20	36.49	
Glycol Ethers		3.54E+05	7.04E+05			1.06E+06	33.44	66.56			
Hydrochloric Acid (Hydrogen Chloride [Gas	7647-01-0	6.16E+06	8.48E+05			7.01E+06	87.89	12.11			
Hexachlorocyclopentadiene	77-47-4	9.40E-02				9.40E-02	100.0				



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Pollutant Name	Cas No.	Emissions (lb)					Percent (%)				
		Point	Nonpoint	Onroad	Nonroad	Total	Point	Nonpoint	Onroad	Nonroad	
							0				
Hexamethylene Diisocyanate	822-06-0	3.18E+03				3.18E+03	100.0				
Hexane	110-54-3	2.99E+06	1.72E+06	1.62E+06	1.54E+06	7.88E+06	37.97	21.87	20.55	19.61	
Hexachloroethane	67-72-1	1.80E-01				1.80E-01	100.0				
Hexachlorobutadiene	87-68-3	2.18E+02				2.18E+02	100.0				
Hexachlorobenzene	118-74-1	9.80E-02	8.68E+00			8.78E+00	1.12	98.88			
Hydrogen Fluoride (Hydrofluoric Acid)	7664-39-3	1.09E+06	7.50E+04			1.16E+06	93.55	6.45			
Hydroquinone	123-31-9	3.16E+03				3.16E+03	100.0				
Isophorone	78-59-1	3.05E+04	5.23E+03			3.57E+04	85.33	14.67			
Maleic Anhydride	108-31-6	5.40E+02				5.40E+02	100.0				
Methyl Ethyl Ketone (2-Butanone)	78-93-3	5.15E+05	8.75E+05			1.39E+06	37.05	62.95			
Methylhydrazine	60-34-4	3.52E+03	8.48E+01			3.61E+03	97.65	2.35			
Methyl Iodide (Iodomethane)	74-88-4	1.91E+01				1.91E+01	100.0				
Methyl Isobutyl Ketone (Hexone)	108-10-1	2.09E+05	1.45E+05			3.54E+05	59.15	40.85			
Methyl Isocyanate	624-83-9	2.00E+00				2.00E+00	100.0				
Methyl Methacrylate	80-62-6	8.82E+04	1.69E+03			8.99E+04	98.12	1.88			
Methyl Tert-Butyl Ether	1634-04-4	1.55E+03	1.29E+02	8.40E-03		1.68E+03	92.30	7.70	0.00		
Methanol	67-56-1	1.17E+06	3.73E+06			4.90E+06	23.82	76.18			
4,4'-Methylenediphenyl Diisocyanate (MDI)	101-68-8	5.96E+03	1.96E+03			7.92E+03	75.25	24.75			
Methyl Chloride (Chloromethane)	74-87-3	1.24E+04	1.03E+05			1.16E+05	10.69	89.31			
Methylene Chloride (Dichloromethane)	75-09-2	1.23E+05	2.93E+05			4.17E+05	29.63	70.37			
Nitrobenzene	98-95-3	6.31E+01				6.31E+01	100.0				
4-Nitrophenol	100-02-7	5.84E+01	4.14E+02			4.72E+02	12.36	87.64			
2-Nitropropane	79-46-9		1.01E+01			1.01E+01		100.00			
N-Nitrosodimethylamine	62-75-9	8.98E+00				8.98E+00	100.0				
Parathion	56-38-2	1.79E+02				1.79E+02	100.0				

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Pollutant Name	Cas No.	Emissions (lb)					Percent (%)			
		Point	Nonpoint	Onroad	Nonroad	Total	Point	Nonpoint	Onroad	Nonroad
Polychlorinated Biphenyls (Aroclors)	1336-36-3	9.52E-01	1.13E+03			1.13E+03	0.08	99.92		
Polychlorinated Dibenzodioxins, Total		2.95E+01	4.92E-01	9.91E-02	5.80E-02	3.02E+01	97.85	1.63	0.33	0.19
Polychlorinated Dibenzo-P-Dioxins and Furans, Total		1.27E+00				1.27E+00	100.0			
Polychlorinated Dibenzofurans, Total		1.06E+00	2.79E-01	2.03E-02	1.06E-02	1.37E+00	77.43	20.32	1.48	0.77
Pentachlorophenol	87-86-5	5.44E+02	2.09E+01			5.65E+02	96.29	3.71		
Tetrachloroethylene (Perchloroethylene)	127-18-4	1.84E+05	3.11E+05			4.95E+05	37.25	62.75		
Phenol	108-95-2	1.76E+05	6.79E+05		7.36E+02	8.56E+05	20.58	79.34		0.09
Phosphine	7803-51-2	1.14E+03	8.38E+02			1.98E+03	57.58	42.42		
Phosphorus	7723-14-0	3.77E+03	1.55E+02		3.70E+01	3.97E+03	95.17	3.90		0.93
Phthalic Anhydride	85-44-9	2.64E+02				2.64E+02	100.0			
Polycyclic Organic Matter		1.72E+04	3.20E+04		4.69E+00	4.92E+04	34.97	65.02		0.01
1,2-Propylenimine (2-Methylaziridine)	75-55-8	1.76E+01				1.76E+01	100.0			
Propionaldehyde	123-38-6	1.08E+04	9.34E+04	1.31E+05	2.45E+05	4.80E+05	2.26	19.46	27.34	50.95
Propoxur	114-26-1	1.70E+01				1.70E+01	100.0			
Propylene Dichloride (1,2-Dichloropropane)	78-87-5	8.98E+02	3.59E+02			1.26E+03	71.44	28.56		
Propylene Oxide	75-56-9	1.64E+03				1.64E+03	100.0			
Quinoline	91-22-5	2.00E+00				2.00E+00	100.0			
Quinone (p-Benzoquinone)	106-51-4	1.90E+03				1.90E+03	100.0			
Styrene	100-42-5	1.25E+06	3.48E+05	4.75E+05	1.94E+05	2.27E+06	55.20	15.34	20.92	8.54
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	1746-01-6	1.00E-03	1.91E-03	6.52E-04	3.54E-04	3.92E-03	25.61	48.69	16.65	9.04
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	1.82E-02	2.88E-02	1.72E-03	9.00E-04	4.96E-02	36.65	58.07	3.46	1.81
Dioxin and Furans (2,3,7,8-TCDD Equivalents)		3.59E-03	8.00E-11			3.59E-03	100.0	0.00		
Methyl Chloroform (1,1,1-Trichloroethane)	71-55-6	4.23E+03	1.98E+06		9.22E-01	1.98E+06	0.21	99.79		0.00
1,1,2,2-Tetrachloroethane	79-34-5	4.19E+03	1.90E+03			6.09E+03	68.83	31.17		
Toluene	108-88-3	1.34E+06	4.67E+06	1.52E+07	1.90E+07	4.02E+07	3.34	11.62	37.82	47.22
2,4-Toluene Diisocyanate	584-84-9	1.79E+03	2.80E+02			2.07E+03	86.49	13.51		
o-Toluidine	95-53-4	6.00E-02				6.00E-02	100.0			

Pollutant Name	Cas No.	Emissions (lb)					Percent (%)			
		Point	Nonpoint	Onroad	Nonroad	Total	Point	Nonpoint	Onroad	Nonroad
Trichloroethylene	79-01-6	2.80E+05	1.85E+04			2.99E+05	93.82	6.18		
1,2,4-Trichlorobenzene	120-82-1	1.82E+04	1.95E+01			1.83E+04	99.89	0.11		
1,1,2-Trichloroethane	79-00-5	9.42E+02				9.42E+02	100.00			
2,4,5-Trichlorophenol	95-95-4	1.01E-01				1.01E-01	100.00			
2,4,6-Trichlorophenol	88-06-2	6.13E-01				6.13E-01	100.00			
Triethylamine	121-44-8	2.36E+03	6.76E+03			9.11E+03	25.85	74.15		
Trifluralin	1582-09-8		1.21E+04			1.21E+04		100.00		
2,2,4-Trimethylpentane	540-84-1	1.15E+04	4.15E+05	6.16E+06	8.81E+06	1.54E+07	0.07	2.70	39.99	57.23
1,2,4-Trimethylbenzene	95-63-6	1.31E+05	1.47E+04			1.46E+05	89.92	10.08		
1,3,5-Trimethylbenzene	108-67-8	4.03E+03				4.03E+03	100.00			
Trimethylbenzene	25551-13-7	2.27E+03	1.45E+04			1.68E+04	13.56	86.44		
Vinylidene Chloride (1,1-Dichloroethylene)	75-35-4	1.80E+02	3.08E+03			3.26E+03	5.52	94.48		
Vinyl Acetate	108-05-4	4.80E+04	1.68E+03			4.97E+04	96.61	3.39		
Vinyl Chloride	75-01-4	4.19E+03	1.38E+04			1.80E+04	23.27	76.73		
m-Xylene	108-38-3	8.20E+03	5.53E+03			1.37E+04	59.73	40.27		
o-Xylene	95-47-6	3.77E+03	1.73E+05			1.76E+05	2.14	97.86		
p-Xylene	106-42-3	3.96E+03				3.96E+03	100.00			
Xylenes (Mixed Isomers)	1330-20-7	1.05E+06	2.10E+06	8.64E+06	9.34E+06	2.11E+07	4.98	9.95	40.89	44.19
<b>Non-Metal Total</b>		<b>2.07E+07</b>	<b>3.09E+07</b>	<b>4.56E+07</b>	<b>4.79E+07</b>	<b>1.45E+08</b>	<b>14.29</b>	<b>21.31</b>	<b>31.38</b>	<b>33.02</b>
<b>Grand Total</b>		<b>2.10E+07</b>	<b>3.17E+07</b>	<b>4.57E+07</b>	<b>4.80E+07</b>	<b>1.46E+08</b>	<b>14.37</b>	<b>21.62</b>	<b>31.20</b>	<b>32.81</b>

**Table 3. Detailed categorization of the 2005 Minnesota emissions for total air toxics.**

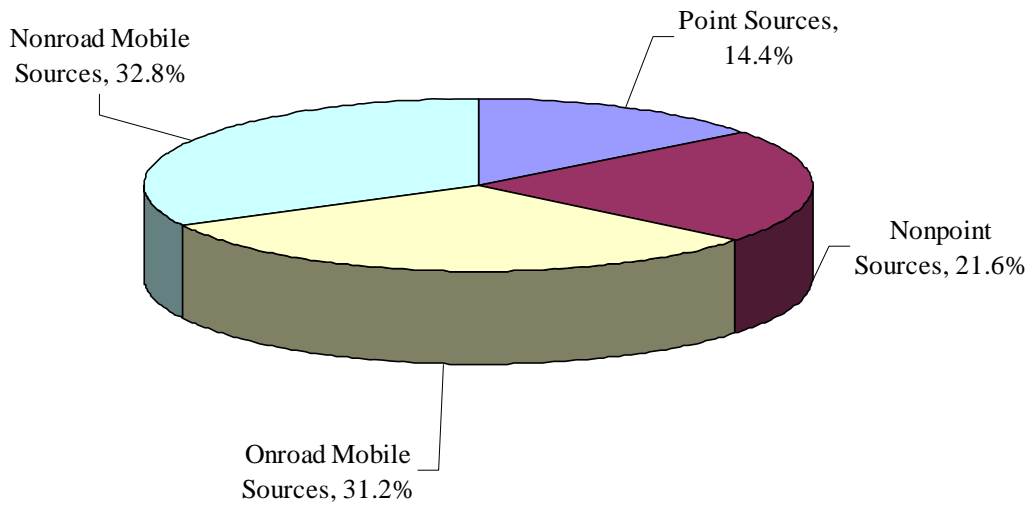
<b>Principal Category</b>	<b>Category</b>	<b>Emissions (lb)</b>	<b>Percent (%)</b>
<b>Point</b>	Electric, Gas, and Sanitary Services	4.83E+06	3.30
	Food and Kindred Products	3.64E+06	2.49
	Paper and Allied Products	2.12E+06	1.45
	Metal Mining	1.88E+06	1.29
	Lumber and Wood Products	1.50E+06	1.02
	Transportation Equipment	1.39E+06	0.95
	Rubber and Misc. Plastics Products	1.12E+06	0.77
	Fabricated Metal Products	9.50E+05	0.65
	Industrial Machinery and Equipment	6.48E+05	0.44
	Petroleum and Coal Products	5.90E+05	0.40
	Chemicals and Allied Products	4.90E+05	0.33
	Stone, Clay, and Glass Products	2.68E+05	0.18
	Electronic & Other Electric Equipment	2.29E+05	0.16
	Printing and Publishing	2.01E+05	0.14
	Instruments and Related Products	1.86E+05	0.13
	Furniture and Fixtures	1.67E+05	0.11
	Primary Metal Industries	1.06E+05	0.07
	Miscellaneous Manufacturing Industries	9.26E+04	0.06
	Special Trade Contractors	6.99E+04	0.05
	Pipelines, Except Natural Gas	6.47E+04	0.04
	Nonmetallic Minerals, Except Fuels	4.65E+04	0.03
	Leather and Leather Products	4.33E+04	0.03
	Wholesale Trade Nondurable Goods	3.95E+04	0.03
	Personal Services	3.90E+04	0.03
	Engineering & Management Services	3.74E+04	0.03
	Educational Services	3.55E+04	0.02
	Auto Repair, Services, and Parking	3.54E+04	0.02
	Trucking and Warehousing	3.15E+04	0.02
	Transportation By Air	3.12E+04	0.02
	Miscellaneous Repair Services	3.03E+04	0.02
	No Description	2.97E+04	0.02
	Wholesale Trade Durable Goods	2.59E+04	0.02
	Automotive Dealers & Service Stations	1.97E+04	0.01
	Textile Mill Products	1.82E+04	0.01
	Health Services	1.15E+04	0.01
	Local and Interurban Passenger Transit	7.46E+03	0.01
	Furniture and Homefurnishings Stores	5.48E+03	0.00
	National Security and Intl. Affairs	2.95E+03	0.00
	Justice, Public Order, and Safety	9.19E+02	0.00
	Amusement & Recreation Services	5.83E+02	0.00
	Social Services	5.83E+02	0.00

<b>Principal Category</b>	<b>Category</b>	<b>Emissions (lb)</b>	<b>Percent (%)</b>
	Communication	3.65E+02	0.00
	Real Estate	3.63E+02	0.00
	Railroad Transportation	1.73E+02	0.00
	General Merchandise Stores	1.66E+02	0.00
	Water Transportation	1.55E+02	0.00
	Insurance Carriers	1.53E+02	0.00
	Business Services	1.47E+02	0.00
	Executive, Legislative, and General	1.24E+02	0.00
	Museums, Botanical, Zoological Gardens	1.08E+02	0.00
	Administration Of Economic Programs	7.92E+01	0.00
	Depository Institutions	7.79E+01	0.00
	Nondepository Institutions	5.85E+01	0.00
	Services, Nec	2.25E+01	0.00
	Agricultural Production Crops	2.00E+01	0.00
	Transportation Services	9.45E+00	0.00
	Food Stores	2.50E+00	0.00
	Miscellaneous Retail	1.67E-01	0.00
<b>Point Total</b>		<b>2.10E+07</b>	<b>14.37</b>
<b>Nonpoint</b>	Commercial and Consumer Products Usage	1.23E+07	8.40
	Residential Wood Burning	2.85E+06	1.94
	Surface Coating - Architectural	2.83E+06	1.93
	Waste Disposal - Open Burning	2.61E+06	1.78
	Gasoline Service Stations	2.60E+06	1.78
	Prescribed Burning for Forest Management	1.43E+06	0.98
	Public Owned Treatment Works (POTWs)	1.28E+06	0.88
	Degreasing	9.40E+05	0.64
	Stationary Source Fuel Combustion - Industrial	7.63E+05	0.52
	Forest Wildfires	6.36E+05	0.43
	Graphic Arts	5.99E+05	0.41
	Swimming Pools	3.86E+05	0.26
	Agricultural Pesticide Use	3.37E+05	0.23
	Structure Fires	3.25E+05	0.22
	Municipal Solid Waste Landfills	2.98E+05	0.20
	Residential Fossil Fuel Combustion	2.90E+05	0.20
	Traffic Markings	2.34E+05	0.16
	Autobody Refinishing	2.31E+05	0.16
	Stationary Source Fuel Combustion - Commercial/Insti	1.88E+05	0.13
	Dry Cleaners	1.61E+05	0.11
	Commercial Cooking	1.61E+05	0.11
	Bulk Stations/Terminals	7.93E+04	0.05
	Industrial Surface Coating	3.72E+04	0.03
	Hospital Sterilization	3.10E+04	0.02
	Asphalt Paving	1.83E+04	0.01
	Animal Cremation	1.73E+04	0.01

<b>Principal Category</b>	<b>Category</b>	<b>Emissions (lb)</b>	<b>Percent (%)</b>
	Gasoline Trucks in Transit	1.00E+04	0.01
	Prescribed Burning of Rangeland	4.44E+03	0.00
	Human Cremation	2.23E+03	0.00
	On-site Incineration	1.64E+03	0.00
	Grain Elevators	8.38E+02	0.00
	Mineral Processes	6.97E+02	0.00
	Tank/Drum Cleaning	6.36E+02	0.00
	Mercury Volatilization	1.96E+02	0.00
	Dental Preparations	6.24E+01	0.00
	Fluorescent Lamp Breakage	3.47E+01	0.00
	General Laboratory Activities	1.00E+01	0.00
	Fluorecent Lamp Recycling	1.90E-02	0.00
<b>Nonpoint Total</b>		<b>3.17E+07</b>	<b>21.62</b>
<b>Onroad</b>	Light Duty Gasoline Vehicles (LDGV)	2.22E+07	15.17
	Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5)	1.45E+07	9.90
	Light Duty Gasoline Trucks 3 & 4 (M6) = LDGT2 (M5)	6.04E+06	4.12
	Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDG)	1.51E+06	1.03
	Heavy Duty Diesel Vehicles (HDDV) Class 8A & 8B	7.17E+05	0.49
	Motorcycles (MC)	3.88E+05	0.26
	Heavy Duty Diesel Vehicles (HDDV) Class 6 & 7	1.82E+05	0.12
	Heavy Duty Diesel Vehicles (HDDV) Class 2B	4.49E+04	0.03
	Heavy Duty Diesel Vehicles (HDDV) Class 3, 4, & 5	4.21E+04	0.03
	Heavy Duty Diesel Buses (School & Transit)	3.54E+04	0.02
	Light Duty Diesel Trucks 1 thru 4 (M6) (LDDT)	1.84E+04	0.01
	Light Duty Diesel Vehicles (LDDV)	1.71E+03	0.00
<b>Onroad Total</b>		<b>4.57E+07</b>	<b>31.20</b>
<b>Nonroad</b>	Recreational Equipment	2.45E+07	16.71
	Pleasure Craft	1.35E+07	9.21
	Lawn and Garden Equipment	4.09E+06	2.79
	Agricultural Equipment	1.97E+06	1.34
	Commercial Equipment	1.58E+06	1.08
	Construction and Mining Equipment	1.13E+06	0.77
	Airport including ground support equipment	5.63E+05	0.38
	Railroad Equipment	2.89E+05	0.20
	Industrial Equipment	2.70E+05	0.18
	Logging Equipment	1.38E+05	0.09
	Marine Vessels, Commercial	4.10E+04	0.03
	Railway Maintenance	2.27E+02	0.00
<b>Nonroad Total</b>		<b>4.80E+07</b>	<b>32.81</b>
<b>Grand Total</b>		<b>1.46E+08</b>	<b>100.00</b>

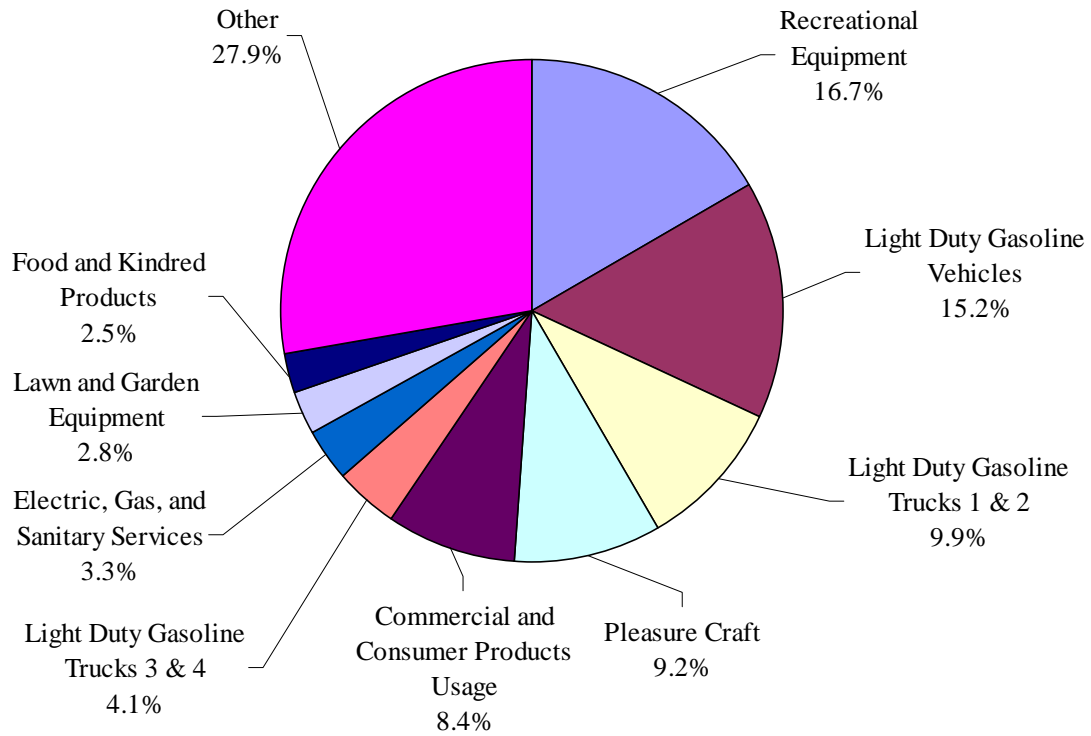
**Figure 1. Contribution of principle source categories to total air toxics emissions**

Total emissions in 2005: 146 million pounds

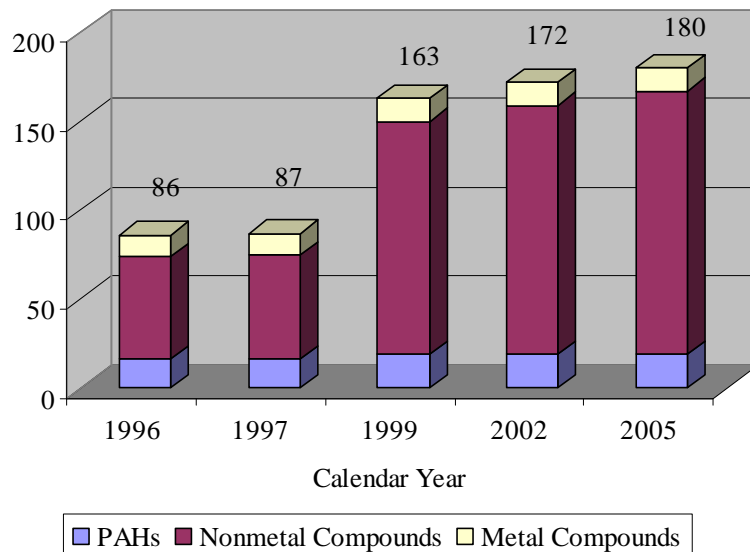


**Figure 2. Contribution of top source categories to state total air toxics emissions**

Total air toxics emissions: 146 million pounds

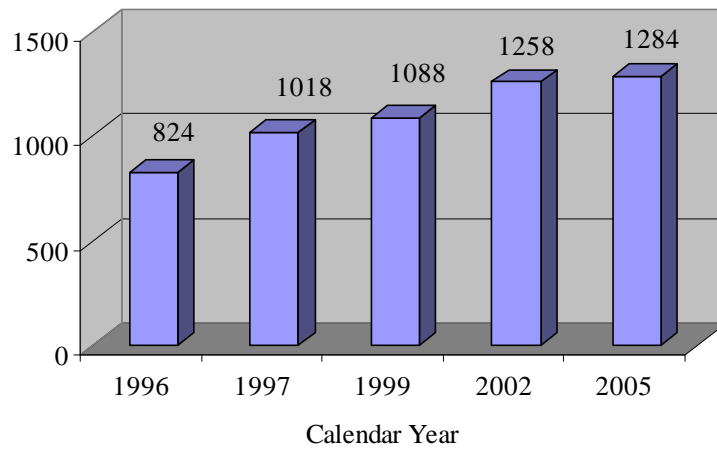


**Figure 3. Number of pollutants inventoried with emission estimates.**





**Figure 4. Number of point sources with emission estimates.**



**Figure 5. Number of nonpoint source categories included in inventories.**

