1996 Inventory of Toxic Air Emissions:

A Product of the Great Lakes Regional

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Acronyms and Abbreviations

AIRS	Aerometric Information Retrieval System
AMS	Area and Mobile Source
BTU	British Thermal Unit
CAA	Clean Air Act
CAR	California Air Resources Board
CAS	Chemical Abstract Service
CEP	Cumulative Exposure Program
DVMT	Daily Vehicle Miles Traveled
EET	Emission Estimating Techniques
EIIP	Emission Inventory Improvement Program
EIS	Emission Inventory System
ESP	Electrostatic Precipitator
FIRE	Factor Information Retrieval System
FPRT	Fuel Process Rate
GIS	Geographic Information Systems
GLC	Great Lakes Commission
GLEI	Great Lakes Emissions Inventory
GLIN	Great Lakes Information Network
GLNPO	Great Lakes National Program Office, U.S. Environmental Protection Agency
GLPF	Great Lakes Protection Fund
HAP	Hazardous Air Pollution
IDEM	Indiana Department of Environmental Management
IEPA	Illinois Environmental Protection Agency
IJC	International Joint Commission
IMS	Information Management System
INDOT	Indiana Department of Transportation
MACT	Maximum Achievable Control Technology
MCEI	Minnesota Criteria Pollutant Emission Inventory
MDEQ	Michigan Department of Environmental Quality
MPCA	Minnesota Pollution Control Agency
MSDS	Material Safety Data Sheet
n.e.c.	Not Elsewhere Classified
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NO_x	Nitrogen Oxides
NTI	National Toxic Inventory
NYDEC	New York Department of Environmental Conservation
OEPA	Ohio Environmental Protection Agency
PAH	Polycyclic Aromatic Hydrocarbons
PDEP	Pennsylvania Department of Environmental Protection
PM	Particulate Matter
POTW	Publicly Owned Treatment Works
QA/QC	Quality Assurance/Quality Control
RAPIDS	Regional Air Pollutant Inventory Development System
SAMS	SIP Air Pollutant Inventory Management System
SCC	Source Classification Code
SIC	Standard Industrial Classification
SIP	

TOG	Total Organic Gases
TRI	Toxic Release Inventory
U.S. EPA	United States Environmental Protection Agency
USDA	United States Department of Agriculture
VOC	Volatile Organic Compound
WDNR	Wisconsin Department of Natural Resources

Preface

The Great Lakes Regional Toxic Air Emissions Inventory project conducts a regional emissions

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Acknowledgments

The Great Lakes Regional Air Toxic Emissions Inventory was compiled by the following Steering Committee members and associates

Executive Summary

Introduction and Inventory Objective

This report, a product of the Great Lakes Regional Air Toxic Emissions Inventory Project, presents a multijurisdictional inventory of point and area sources (mobile to be published early next year) of toxic air emissions that have the potential to impact environmental quality in the Great Lakes basin. This initiative was undertaken through an intergovernmental partnership involving the eight Great Lakes states, the province of Ontario, and the U.S. Environmental Protection Agency (U.S. EPA). The objective of this ongoing initiative is to present researchers and policy makers with detailed, basin wide data on the source and emission levels of 82 toxic contaminants.

The development and release of the inventory is an important step in meeting the goals of the 1986 Great Lakes Toxic Substances Control Agreement (signed by the Great Lakes governors and Premier of Ontario), and sections 112(c)(6), 112(k) and 112(m) of the 1990 U.S. Clean Air Act Amendments (see http://www.cglg.org/pub/toxics/index.html and http://earth1.epa.gov/oar/caa.html for further details).

The inventory project presents a compilation of the best available data for calendar year 1996 emissions from point and area sources. The data will be updated annually and the level of detail will increase year to year. This project also released version 2.0 of the *Regional Air Pollutant Inventory Development System (RAPIDS)* to calculate emissions for 82 pollutants (which include mobile sources). The Great Lakes jurisdictions believe this work will provide a strong foundation upon which to build national and binational strategies to reduce toxic air emissions affecting the Great Lakes.

The inventory effort focused on the identification of point and area source categories that contribute to the total emissions of toxic contaminants listed in Table 1-1. This list of 82 contaminants was compiled using the International Joint Commission's list of Great Lakes critical pollutants, U.S. EPA's list of targeted toxic chemicals and compounds defined in the U.S. Clean Air Act Amendments of 1990, section 112 (c)(6), and those pollutants suggested by the Great Lakes states. This project also identified significant number of small point and area sources not currently regulated under the Clean Air Act (CAA) and collectively release large amounts of one or more toxic air pollutants of concern. These sources include many traditionally unregulated sites with relatively small gas-fired, coal-fired, or oil-fired boilers, traffic markings, woodburning stoves and fireplaces and generally any facility with an incinerator. These are sources within one county or urban area that collectively release large amounts of one or more toxic air pollutants of concern.

The inventory project is strengthening decision making capabilities in the basin by promoting interjurisdictional consistency in data collection and analysis, establishing standard procedures and protocols, developing and testing an automated emission estimation and inventory system, and demonstrating the value of client/server technology via the Internet to transmit and exchange environmental data among the Great Lakes jurisdictions and inform the larger Great Lakes community.

Inventory Scope and Findings

The 1996 emissions inventory effort began in September 1998 with primary funding provided by the U.S. EPA. In August 1998, the 1993 point and area source inventory was released. Over the four previous years, the Great Lakes states, with support from the U.S. EPA and the Great Lakes Protection Fund developed and tested (through a Southwest Lake Michigan Inventory), the regional infrastructure and tools for emissions inventory compilation including the *Regional Air Pollutant Inventory Development System* (RAPIDS) versions 1.0 and 2.0 and the *Air Toxic Emissions Inventory Protocol for the Great Lakes States.*

In compiling the inventory, challenges were encountered in the area of data breadth, quality, availability and consistency from one jurisdiction to the next. Given variances in staffing resources and data management from one jurisdiction to the next, project staff received data in varied forms that needed to be standardized before being incorporated into the inventory.

The 1996 inventory should not be used for jurisdictional comparisons, but rather to demonstrate the potential of such a complete and comprehensive inventory as a decision support tool. Key findings associated with the inventory effort, as expressed by the federal, state, and provincial members of the project Steering Committee, are as follows:

- A comprehensive, multijurisdictional inventory of toxic air pollutants, sources and emission levels within the Great Lakes basin provides an important decision-making tool for environmental protection efforts.

- Air emissions data varies significantly from one Great Lakes jurisdiction to the next in terms of breadth, quality and availability. Greater consistency in data acquisition, compilation and analysis is needed to ensure meaningful basin wide assessment and interjurisdictional comparison.

- Great Lakes jurisdictions are well advised to develop and maintain the program and staffing infrastructure needed to participate in basin wide emissions inventory efforts over the long term. Continuity in inventory development and updating will provide a much-needed benchmark for trend identification and analysis.

Inventory Methodology

The Regional Toxic Air Emissions Inventory effort focuses on significant sources of air emissions of 82 toxic air pollutants in the jurisdictions bordering the Great Lakes. Working cooperatively through the Great Lakes Commission, inventory work is undertaken by the air quality departments of the state and provincial governments in the region. Staff at each agency followed the *Regional Toxic Air Emissions Inventory Protocol* they developed jointly and finalized in June 1994. The protocol provides instructions to accomplish the regional inventory development effort so the inventory is complete, accurate, and consistent from one jurisdiction to the next. The protocol:

Emissions estimates for the 82 target compounds are presented in the first half of this report. Definitions of source categories, and the level of detail in emissions estimates, are state/province specific and are outlined in the state/provincial reports in Appendices A through I.

Next steps

This project is releasing its inaugural toxic mobile source emissions inventory using 1996 data early next year. This inventory will serve as a template for future mobile source inventories for both this project and on an individual state and provincial basis, both within and beyond the Great Lakes region.

Through the continued efforts of the Steering Committee, the inventory will become more comprehensive over time and become an increasingly valuable tool for decision making within the Great Lakes basin. The Steering Committee will continue to meet on a regular basis to discuss inventory enhancements, both through defining data collection and refining and testing the RAPIDS software to accommodate continued expansion of this project.

The Steering Committee has developed RAPIDS to include a mobile source estimation module which is used by each Great Lakes jurisdiction to estimate emissions from cars, trucks, trains, recreation vehicles, airplanes, marine vessels, farm equipment, construction equipment and other non-road engines. This expansion of RAPIDS provides a complete profile for air toxic emissions and expands the list of toxic compounds of concern to 82. The complete 1996 point, area and mobile source emissions inventory is available on the Great Lakes Information Network (GLIN) at http://great-lakes.net/envt/air/airtox.html.

Collection of 1997 and 1998 data for point and area sources is already underway. For the 1999 inventory, the Steering Committee is also planning to expand its list from 82 pollutants to match the 188 hazardous air pollutants designated by the U.S. EPA.

This bridges the gap between the science of inventorying toxic air emissions and the public policy debate concerning how these emissions affect human health and the environment and how they should be addressed. Follow-up by state, provincial and federal environmental protection agencies is necessary to make further progress toward these goals. The Steering Committee recommends that regulatory decisions not be based on this data alone.

1. Introduction

The Great Lakes Regional Air Toxic Emissions Inventory represents a unique milestone in the continuing effort to quantify and manage the toxic air emissions that impact the waters of the Great Lakes Basin. The air management programs in all eight Great Lakes states, Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin, and the province of Ontario, cooperated in compiling an emissions inventory of toxic air contaminants from point and area sources.

The emission inventory effort was developed in support of the Great Lakes Toxic Substances Control Agreement signed in 1986 by the governors of eight Great Lakes states, and in 1989 by the premier of Ontario. This agreement contains a provision ensuring cooperation toward "quantifying the loadings of toxic substances originating from all sources, with the purpose of developing the most environmentally and economically sound control programs". Sharing emissions information of comparable and compatible quality across jurisdictions will ensure sound regulatory and policy decisions in the region.

Since 1989, the Great Lakes states and Ontario have been working together, through the Great Lakes Commission (GLC), to develop a regional database of toxic air emissions. In 1994, the Southwest Lake Michigan Air Toxics Pilot Inventory project was developed. This pilot inventory, led by the states of Michigan, Illinois, Indiana and Wisconsin, served to test the infrastructure for regional emissions inventory compilation and to develop the Regional Air Pollutant Inventory Development System, RAPIDS. The pilot inventory focused on emissions of 49 compounds from small point and area sources. In late 1995, the eight Great Lakes states and Province of Ontario began compiling the first full inventory of toxic air emissions from point and area sources for the year 1993. That pilot inventory was completed in 1998 while the states and province began work on the base year 1996 inventory. Compilation of the 1997 and 1998 inventories are currently underway. The GLC will continue working with state and provincial agencies, organizations and industrial sectors in developing and implementing the latest emission estimation procedures.

In 1996, work began on the mobile source module for RAPIDS. RAPIDS 2.0 was designed with the ability to estimate emissions from on-road vehicles and non-road engines. This major addition, along with other enhancements, has made RAPIDS one of the most comprehensive multimedia inventory systems available. With the addition of mobile sources to the inventory, the database has been expanded to include 82 toxic air pollutants. The states and province began estimating mobile source emissions using RAPIDS 2.0 in late 1998.

Table 1-1: Great Lakes Commission's list of 82 targeted toxic air pollutants.

Non-Metal Compounds (Excluding PAHs)	
Acetaldehyde	Methyl chloroform (1,1,1-Trichloroethane)
Acrolein	Methylene chloride (Dichlorot.9 f 526.5 695.25 0. 29 5h2.25 0.75e f 2993

The 1996 reports are available as a printed document or online via the Great Lakes Information Network (GLIN, http://www.great-lakes.net). Additional information, including background documents, GIS maps depicting air emissions across the basin, the emissions protocol document and list of products for the project are located on the emission inventory project's web site (http://www.glc.org/air/air3.html).

The air emissions inventory project is funded primarily by the U.S. EPA under the auspices of the urban area sources program, Section 112(k), and the Great Waters program, Section 112(m).

The eight states and Ontario will continue to work collaboratively to improve and refine the toxics inventory and strengthen its ability to support sound regulatory decisions at all levels of government.

2. Methodology

The Great Lakes Air Toxic Emissions Inventory Project focuses on locating, evaluating, and estimating emissions from sources regulated under each of the state and provincial air management programs. The inventory process also includes a number of small point and area sources not currently regulated under the Clean Air Act (CAA) and that collectively release large amounts of one or more toxic air pollutants of concern. These sources include small coal-fired boilers, consumer solvents, residential fuel combustion, wood burning stoves, and fireplaces. Summaries of the methodologies for area source emission estimations are shown in Appendices J through Y. These area source methodologies were based on the U.S. EPA's Emissions Inventory Improvement Program (EIIP) and the Great Lakes States methods for estimation emissions from 2.

automated tools available for developing the regional inventory (RAPIDS, FIRE, SPECIATE and others).

Since the participating states envision that the full regional database of air toxic emissions data and estimates will be updated periodically, the protocol also provides the procedures to update the regional inventory and an estimated schedule for such updates. Procedures to resolve differences of opinion among the participating states regarding various aspects of the regional inventory development effort is a significant component of the protocol.

The protocol outlines the major steps and checkpoints that the Great Lakes jurisdictions followed

The protocol refers to certain software tools (e.g. the Regional Air Pollutant Inventory Development System, discussed below) that can be used to prepare a state or province's portion of the regional inventory. However, the protocol procedures, if followed, will result in emissions data and estimates that are compatible and consistent, whether or not these software tools are used.

Developing and Testing Client/Server Emission Estimation and Inventory Software: RAPIDS

Development of the Regional Air Pollutant Inventory Development System (RAPIDS) has been the key to the effort to develop a comprehensive, accurate and consistent air toxic emissions inventory across eight states and one province of Ontario.

During the course of this inventory, the regional Steering Committee worked closely with the project software development contractor, Windsor Technologies Inc., to enhance and test RAPIDS. The RAPIDS enhancements during this phase of the project included: the incorporation of a mobile source module to estimate emissions from on-road and non-road mobile sources, growth factors algorithm to project emissions, controlled emission factor functionality, development of mobile sources emission factors, and improvement of emissions estimation and reporting capabilities. This effort represents the first attempt to prepare software for estimating toxic pollutant emissions on a multi-state basis. RAPIDS is a client/server system developed in PowerBuilder® with an ORACLE® back-end database. The software takes full advantage of new Internet/Great Lakes Information Network (GLIN) connections between the states, the Great Lakes Commission and the U.S. EPA GLNPO office in Chicago. For a more detailed discussion on RAPIDS, please see http://great-lakes.net/envt/air/airtox.html.

Collecting and Compiling Data from Eight States and One Province

Each state and province based emission estimates on the best available inventory data. The states and province promoted consistency among their respective inventories by following the *Air Toxics Emissions Inventory Protocol for the Great Lakes States* and by using emission factors from FIRE Version 6.0 or later.

Rather than comparing emissions from one jurisdiction to the next, the emphasis of this project was to prepare a reliable and technically accurate inventory for the region as a whole and to outline areas where improvements are needed in overall methodology and implementation.

Coordination Methods

As a regional effort, a high level of coordination and communication was necessary to ensure consistency among the eight states and province in terms of data management, methodology, calculation methods and other issues. The Great Lakes Commission provided project management and secretariat services.

During the course of the inventory, Steering Committee members and associates communicated via daily e-mail exchanges, conference calls on a weekly or biweekly basis, and monthly or bimonthly in-person meetings to oversee contractor development of the inventory software, and to resolve outstanding issues and inconsistencies among the eight states and one province contributing to the regional inventory.

The Steering Committee developed an Internet group mailing service, airtoxics@great-lakes.net, which facilitates transmittal of thousands of messages between members, contractors, and with a larger group of peer reviewers, university and industry researchers, other Great Waters/Urban Area Source states (including Texas and Louisiana), and federal agency representatives. The Great Lakes Commission holds a complete archive of all airtoxics@great-lakes.net messages, including minutes for all conference calls and in-person meetings at http://great-lakes.net/lists/airtoxics/.

Finally, the Steering Committee established Quality Assurance/Quality Control (QA/QC) criteria for use by the states and province to ensure the report provides an accurate and useful summary of toxic air emissions at the regional level. The committee then made a QA/QC review of the regional inventory to identify and correct any remaining differences. Details of the Steering Committee QA/QC efforts and all related e-mail transactions have been archived by the Great Lakes Commission.

3. Results

The following results represent emissions from point and area sources in the Great Lakes region. These results are based on 1996 data. Mobile sources for 1996 will be released early next year.

Definitions of point and area sources are dependent on data collection methods, as reporting requirements for air toxics emissions are different from state to state, one emission source defined as an area source in one state may be covered as a point source in other states.

The regional emission inventory, using 1996 data, includes emissions from 16 area source categories:

- Agricultural Pesticide Application
- Architectural Surface Coatings
- Auto Body Refinishing
- Chromium Electroplating
- Consumer and Commercial Solvent Use
- Dry Cleaning
- Gasoline Marketing
- Graphic Arts
- Industrial Surface Coating
- Landfills
- Marine Vessel Loading, Ballasting, and Transit
- Public Owned Treatment Works
- Residential Fuel Combustion
- Residential Wood Combustion
- Solvent Cleaning
- Traffic Markings

Although these categories are covered by all states, some states and the province of Ontario may not estimate emissions for some area source categories due to the coverage of point sources and resource restrictions. For example, the Marine Vessel Loading, Ballasting, and Transit category is covered in point sources for IL, IN, and WI. No emissions were estimated for this area source category from these states.

Overall

The 1996 emissions were estimated for 82 target compounds, however, data were only available to obtain emissions for 77 air toxins, including 16 polycyclic aromatic hydrocarbons (PAHs), 49 non-metal compounds and 12 metal compounds. Table 2 shows pollutant names and estimated emissions from point and/or area sources. Among the 77 pollutants, 76 pollutants are emitted from point sources, and 62 pollutants are emitted from area sources. Area sources contribute more than two thirds of total emissions for 15 PAHs, 16 non-metal compounds, and 1 metal compound. Point sources are responsible for more than two thirds of total emissions for 1 PAH, 29 non-metal compounds and 10 metal compounds. The contributions of point and area sources to the remaining four non-metal compounds and one metal compound are relatively even.

Among the 77 pollutants, toluene was estimated to have the highest emissions at 265,156,995 pounds, while 2,4,5-Trichlorophenol emissions are the lowest recorded at about 0.02 pounds. Point and area source emissions are from 641 distinct standard industrial classification (SIC) codes and 1143 distinct source classification codes (SCC).

It should be noted that this project has demonstrated that area sources are significant contributors to the total emissions of certain toxic air pollutants; further improvement on emissions estimation techniques and development of emission factors are needed for some source categories.

Specific Pollutants

A closer look was taken at the top five non-metal compounds and the top five metal compounds according to the emission totals. The selected pollutants are toluene, xylenes (includes o, m, and p), tetrachloroethylene, benzene, methyl chloroform, manganese, chromium, copper, lead, and nickel.

The source contribution of emissions for the selected 10 pollutants was analyzed by category for area sources and the first two digits of the SIC codes for point sources. The most significant source categories and their contributions are shown in Tables 3 and 4. More than 90% of emissions of tetrachloroethylene, benzene, and methyl chloroform are attributed to area sources. Dry Cleaning and Solvent Cleaning account for about 75% and 17% of tetrachloroethylene emissions, respectively. Residential Wood Combustion and Gasoline Marketing contribute approximately 71% and 9% of benzene emissions, respectively. Solvent Cleaning is responsible for about 62% of methyl chloroform emissions while Consumer and Commercial Solvent Use accounts for 35% of the total contribution. Although more than 73% of emissions are from area sources for toluene and xylenes, the source distribution is more scatted. The contributions from Solvent Cleaning, Consumer and Commercial Solvent Use, Gasoline Marketing, Architectural Surface Coatings, and Industrial Surface Coating ranged from 6.3% to 20.4% of toluene emissions. Consumer and Commercial Solvent Use, Gasoline Marketing, SIC 37xx (Manufacturing of Transportation Equipment), Industrial Surface Coating, and Auto Body Refinishing contribute from 8.5% to 22.6% of xylenes emissions.

In contrast with the top five non-metal compounds, point sources dominate the emissions of the top five metal compounds, accounting for more than 91% contributions. The most significant source category for all five metal compounds is Primary Metal Industries (SIC code 33xx) which contribute 33% to nickel emissions and up to 82% to copper emissions. Other significant sources include SIC 32xx (Stone, Clay, and Glass Products) with a 27.5% contribution to manganese; SIC 49xx (Electric, Gas, and Sanitary Services) with a 36.3% contribution to chromium, 19.4% contribution to lead and a 27.6% contribution to nickel; and SIC 10xx (Metal Mining) with a 17.3% contribution to lead.

Detailed analyses of source contributions for each pollutant are shown in pie charts and tables following Table 3-3.

Please note that the above analysis is based on point and area source emissions only. Mobile sources have been identified as significant sources for benzene, 1,3-butadiene, formaldehyde, and acrolein. Therefore, the source contributions are expected to change for these pollutants when mobile source emissions become available for analysis.

Table 3-1: Summary of 1996 air toxics emissions from point and area sources

Pollutant Name	Cas No.	Point (lb)	Area (lb)	Total (lb)	Point (%)	Area (%)

Table 3-4: Summary of 1996 air toxics emissions by SCC. (Those represented contribute more than 5% to the regional total)

SCC	Material Code	IL	IN	MI	MN	NY	OH	PA	WI	ON	Emissions
[illegible]	ACENAPHTHYLENE		x		x		x	x			[illegible]
[illegible]	ACENAPHTHYLENE x	x					x	x			[illegible]
Other	ACENAPHTHYLENE	x	x	x	x	x	x		x	x	[illegible]
[illegible]	ACETALDEHYDE		x		x	x	x		x		[illegible]
[illegible]	ACETALDEHYDE x					x					[illegible]
[illegible]	ACETALDEHYDE							x			[illegible]
[illegible]	ACETALDEHYDE						x				[illegible]
Other	ACETALDEHYDE	x	x	x	x	x	x	x	x	x	[illegible]
[illegible]	ACROLEIN x						x				[illegible]
[illegible]	ACROLEIN		x								[illegible]
[illegible]	ACROLEIN		x								[illegible]
Other	ACROLEIN	x	x	x	x	x	x	x	x		[illegible]

[redacted]ummary of 1996 air toxics emissions by SCC. (continued)

[redacted]	Material Code	IL	IN	MI	MN	NY	OH	PA	WI	ON	Emissions	Regional Percentage
[redacted]	BENZO(K)FLUORANTHENE				x		x		x	x	51109.0534524588	87.47170
[redacted]	BENZO(K)FLUORANTHENE		x	x					x	x	4811.0767676429	8.23402
[redacted]	BENZO(K)FLUORANTHENE	x	x		[redacted]	x			x	x	2509.1154092104	4.29428
[redacted]	BERYLLIUM	x	x	x	[redacted]	x		x	x	x	6074.7461916712	37.54800
[redacted]	BERYLLIUM		x	x		x		x			3573.2830301510	22.08646
[redacted]	BERYLLIUM		x		x	x	x				1659.4097269998	10.25681
Other	BERYLLIUM	x	x	x	x	x		x	x	x	4871.1752741303	30.10873

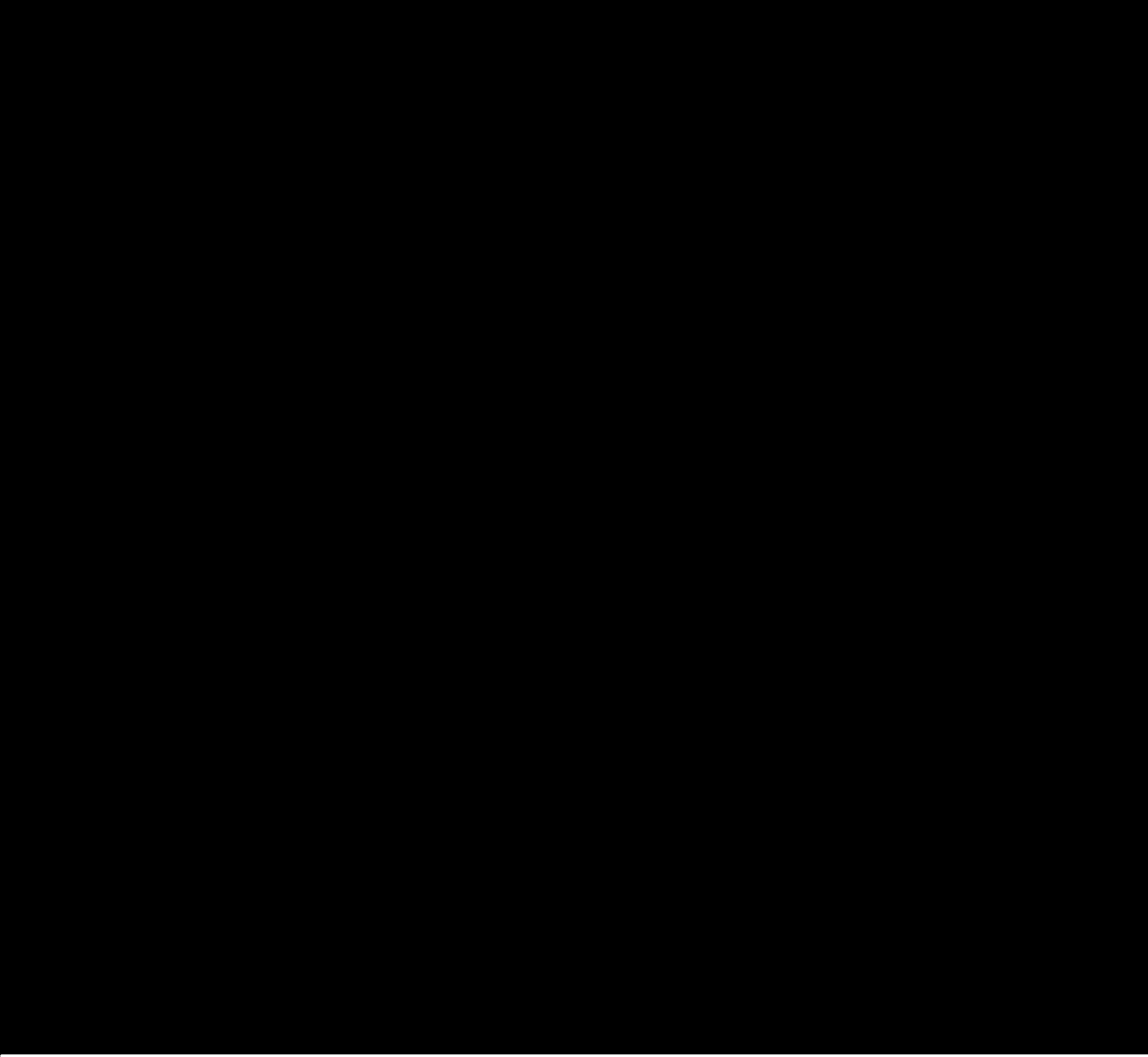


Table 3-4: Summary of 1996 air toxics emissions by SCC. (continued)

SCC	Material Code	IL	IN	MI	MN	NY	OH	PA	WI	ON	Emissions	Regional Percentage
2461800000	TRIFLURALIN	x		x	x						656024.0821191450	99.04551
Other	TRIFLURALIN	x	x				x				6322.0273805638	0.95449
30101864	VINYL CHLORIDE			x							567293.4121090000	64.15590
64630001	VINYL CHLORIDE	x									138000.0000000000	15.60659
2630020000	VINYL CHLORIDE	x			x					x	131078.8564672990	14.82387
Other	VINYL CHLORIDE	x	x	x	x	x	x		x	x	47869.6755859449	5.41364
2501060101	XYLENE,M				x					x	281368.223644146	34.69789
2415000000	XYLENE,M			x	x						151594.080099535	18.69435
2501060100	XYLENE,M								x		70041.000000000	8.63735
0	XYLENE,M		x			x	x				46527.040000000	5.73764
Other	XYLENE,M		x	x	x	x		x	x	x	549530.343743681	67.76723
2104008051	XYLENE,O				x		x		x	x	5162048.98052351	25.83346
2401990000	XYLENE,O			x	x			x			4378803.21208584	21.91371
2401001000	XYLENE,O							x		x	4035705.32256469	20.19667

Figure 3-1:

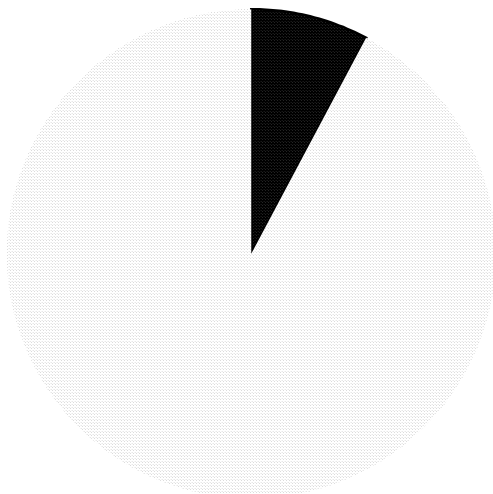
SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3312	Blast furnaces and steel mills	40,954.26	X	X					X		
-------	Residential wood combustion	204,768.23	X	X	X	X		X	X		X
-------	Other Sources**	130.80	X	X	X	X	X		X		

Total Estimated Emissions: 245,853.29 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.

** Other Sources: Individually less than five percent of the total.

Figure 3-2:



SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3312	Blast furnaces and steel mills	202,537.59	X	X					X		
-------	Residential wood combustion	2,431,824.46	X	X	X	X		X	X		X
-------	Other Sources**	461.18	X	X	X	X	X		X		

Total Estimated Emissions: 2,634,823.24 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.
** Other Sources: Individually less than five percent of the total.
(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-3:

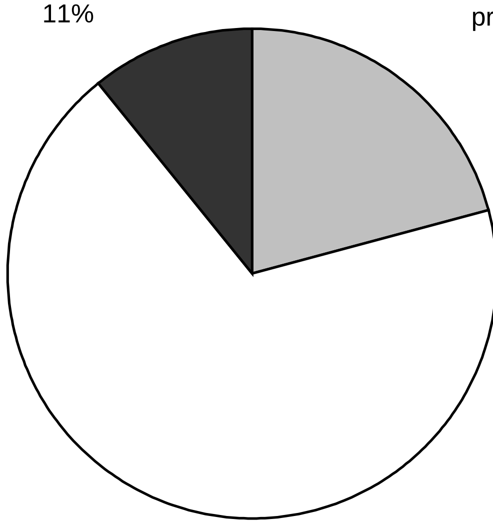
SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2611	Pulp mills	216,620.35			X		X	X	X		X
2621	Paper mills	315,350.10	X		X	X	X			X	X
2631	Paperboard mills	358,254.24	X	X				X		X	X
2821	Plastics materials and resins	323,387.26	X	X			X	X			
-------	Public owned treatment works	340,310.28	X								X
-------	Other Sources**	366,251.99	X	X	X	X	X	X	X	X	X

Total Estimated Emissions: 1,920,174.23 lbs.

AC ET ALDEHYDE1996 Estimated Emissions*

Figure 3-4:

ACROLEIN
1996 Estimated Emissions* by Source Category for Point and Area Sources



SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2493	Reconstituted wood products	97,692.07	X		X	X					
-------	Public owned treatment works	318,987.36	X								X
-------	Other Sources**	50,486.39	X	X	X	X	X	X		X	X

Total Estimated Emissions: 467,165.83 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.
** Other Sources: Individually less than five percent of the total.
(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-5:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2672	Paper coated and laminated, nec	255.00									X

Figure 3-7:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3312	Blast furnaces and steel mills	32,227.88	X	X					X		

Figure 3-8:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2816	Inorganic pigments	16,718.00						X			X
2911	Petroleum refining	3,301.73	X	X		X		X			
3229	Pressed and blown glass, nec	4,132.00						X			
4911	Electric services	5,375.04	X	X	X	X	X		X	X	
4952	Sewerage systems	7,403.12	X		X	X	X		X		

Figure 3-9:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
1011	Iron ores	68,367.33			X	X			X		
4911	Electric services	70,889.06	X	X	X	X	X		X	X	X

Figure 3-10:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Agricultural pesticide application	9,540,401.15	X	X	X	X	X	X			X

Total Estimated Emissions: 9,540,401.15 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.

Figure 3-11:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

Figure 3-12:

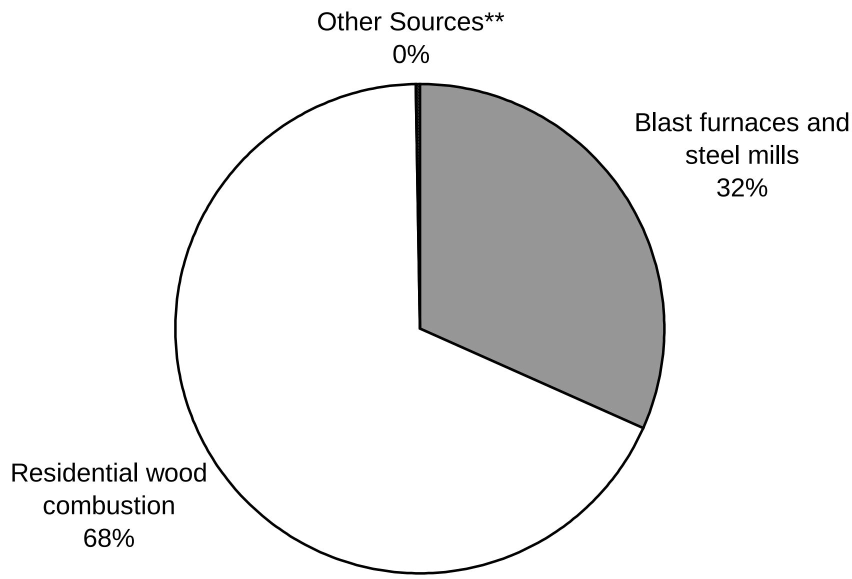
SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2911	Petroleum refining	39,272.37	X	X	X	X	X		X		
3312	Blast furnaces and steel mills	28,054.35	X	X	X				X		
-------	Public owned treatment works	14,734.96									X

Figure 3-13:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

Figure 3-14:

BENZO(B)FLUORANTHENE
1996 Estimated Emissions* by Source Category for Point and Area Sources



SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3312	Blast furnaces and steel mills	59,321.22							X		
-------	Residential wood combustion	127,953.70	X	X	X	X		X	X		X
-------	Other Sources**	478.65	X	X	X	X	X		X		X

Total Estimated Emissions: 187,753.57 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.
** Other Sources: Individually less than five percent of the total.
(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-15:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3312	Blast furnaces and steel mills	20,495.07	X	X					X		
-------	Residential wood combustion	111,024.52	X	X	X	X		X	X		X
-------	Other Sources**	299.61	X	X	X	X	X		X		

Total Estimated Emissions: 131,819.19 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.

Figure 3-17:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3241	Cement, hydraulic	3,914.47	X	X	X		X			X	
3351	Copper rolling and drawing	1,653.02	X					X			
4911	Electric services	8,037.34	X	X	X	X	X		X	X	X
-------	Other Sources**	2,573.78	X	X	X	X	X		X	X	X

Total Estimated Emissions: 16,178.61 lbs.

Figure 3-18:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
4952	Sewerage systems	923.15									X

Total Estimated Emissions: 923.15 lbs.

* Each jurisdiction estimated emissions for those sources fs969(a)14.5(c)-11.8(h)-ihhr* O re 219her10I4.5(S)-8 202.56 33b3G1 1.27e109(f6(:)546 Ire 28(ndTc6 2(v

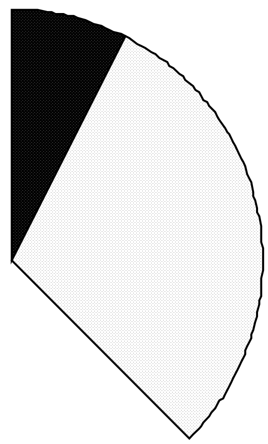
Figure 3-19:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Gasoline marketing	6,065,974.65			X	X					X

Figure 3-20:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

Figure 3-23:



SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2611	Pulp mills	118,092.30							X	X	X
2621	Paper mills	466,235.98				X	X			X	X
2821	Plastics materials and resins	724,189.82		X			X			X	
-------	Public owned treatment works	78,842.26	X			X			X		
-------	Other Sources**	174,484.41	X	X	X	X	X	X	X	X	X

Total Estimated Emissions: 1,561,844.76 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.

** Other Sources: Individually less than five percent of the total.

(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-24:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

Ca8-9633

Figure 3-25:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3432	Plumbing fixture fittings and trim	3,003.05	X								
3471	Plating and polishing	5,889.73 ndur									

Figure 3-26:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

Figure 3-27:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
4911	Electric services	10,638.89	X	X	X	X	X		X		X

Figure 3-28:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3312	Blast furnaces and steel mills	1,861,934.47	X	X	X						
-------	Other Sources**	64,896.00		X							

Total Estimated Emissions: 1,926,830.47 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.

Figure 3-29:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

Figure 3-30:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3312	Blast furnaces and steel mills	8,169.44	X						[redacted]		
-------	Residential wood combustion	65,348.56	X	X	X	X		X	X		X

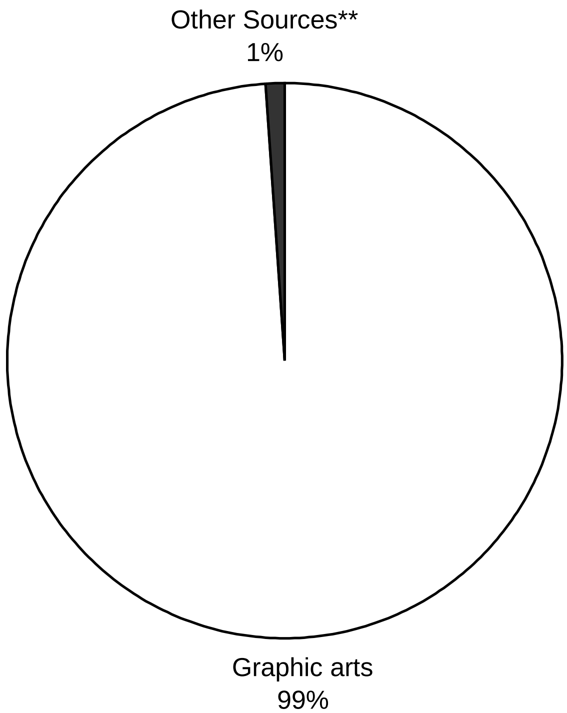
[redacted]

Figure 3-31:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

Figure 3-32:

DI-N-BUTYL PHTHALATE
1996 Estimated Emissions* by Source Category for Point and Area Sources



SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Graphic arts	5,310,077.84		X	X		X	X	X	X	X
-------	Other Sources**	52,643.27	X	X	X	X	X	X	X	X	X

Total Estimated Emissions: 5,362,721.10 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.
** Other Sources: Individually less than five percent of the total.
(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-33:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2899	Chemical preparations, nec	151,822.05		X					X		
-------	Gasoline marketing	11,882.77			X	X			X		X
-------	Other Sources**	22,622.08	X	X	X	X	X		X		X

Total Estimated Emissions: 186,326.90 lbs.

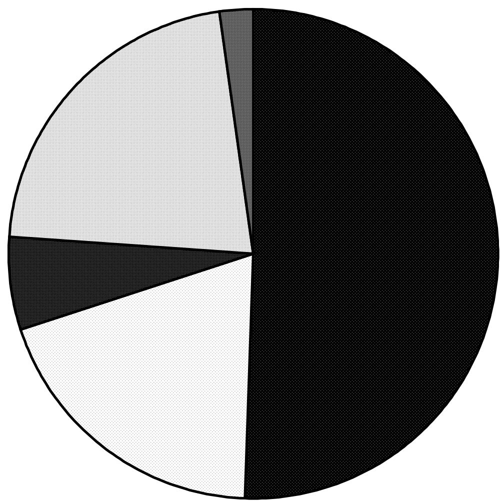
* Each jurisdiction estimated emissions for those sources for which they had data available.
** Other Sources: Individually less than five percent of the total.
(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-34:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
0	Unknown	3,954.21	X			X	X				
2431	Millwork	2,660.80		X		X					
2499	Wood products, nec	4,080.00		X			X				
2899	Chemical preparations, nec	4,409.20							X		
3021	Rubber and plastics footwear	3,863.00					X				
3086	Plastics foam products	3,873.48							X		
3089	Plastics products, nec	2,308.51		X		X			X		X
3716	Motor homes	6,878.00		X							
-------	Other Sources**	12,612.31	X	X	X	X	X		X		[redacted]

Figure 3-35:

DI-N-OCTYL PHTHALATE
1996 Estimated Emissions* by Source Category for Point and Area Sources



SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2431	Millwork	4,060.00		X							
2511	Wood household furniture	1,582.00					X				
3499	Fabricated metal products, nec	480.00		X							
3931	Musical instruments	1,740.00		X							
-------	Other Sources**	185.87		X	X		X				

Total Estimated Emissions: 8,047.87 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.
** Other Sources: Individually less than five percent of the total.
(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-36:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3711	Motor vehicles and car bodies	1,372,366.31	X	X	X	X	X	X	X		X
-------	Architectural surface coatings	6,938,684.35	X	X	X	X	X	X	X	X	X
-------	Gasoline marketing	4,810,030.13	X	X	X	X			X	X	X
-------	Industrial surface coating	1,312,203.46	X	X	X	X				X	X
-------	Marine vessel loading, ballasting, & transit	1,047,585.60					X			X	
-------	Other Sources**	4,111,806.19	X	X	X	X	X	X	X	X	X

Total Estimated Emissions: 19,592,676.04 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.

Figure 3-37:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Consumer and Commercial Solvent Use	836,736.51	X	X	X	X	X				X

Figure 3-38:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3312	Blast furnaces and steel mills	68,044.95	X	X					X	X	
3334	Primary aluminum	42,155.03		X			X				
-------	Residential wood combustion	379,983.92	X	X	X	X		X	X		X
-------	Other Sources**	18,686.29	X	X	X	X	X		X	X	X

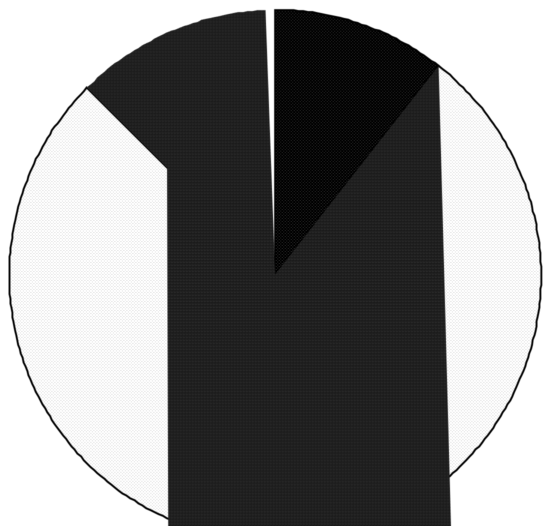
Figure 3-39:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3312	Blast furnaces and steel mills	134,929.05	X	X					X		

Figure 3-40:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2911	Petroleum refining	6,342,952.17	X	X		X	X			X	X

Figure 3-42:



SIC	DESCRIPTION	E[illegible]	[illegible]	IN	MI	MN	NY	OH	ON	PA	WI
2621	Paper mills	[illegible]	[illegible]			X					
3241	Cement, hydraulic	[illegible]	[illegible]						X		
-------	Agricultural pesticide application	[illegible]	[illegible]			X					X
-------	Other Sources**	[illegible]	[illegible]						X		

Total Estimat[illegible] 9.94 lbs.

* Each jurisdiction estimated emissions for those sources for which [illegible]

** Other Sources: Individually less than five percent of the total.

(X) Denotes jurisdictions that have contributed emissions data for th[illegible]

Figure 3-44:

SIC	DESCRIP
3011	Tires and inner tube

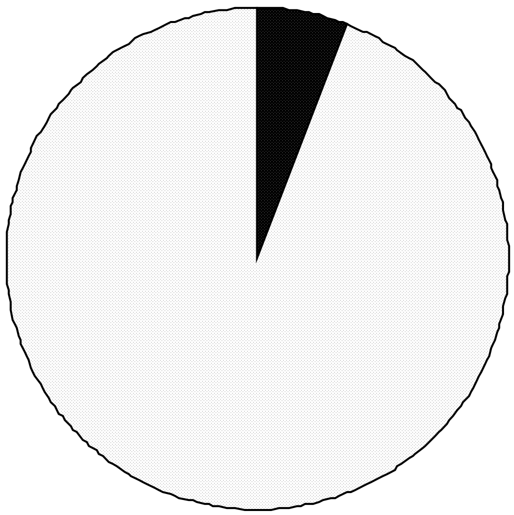
* Each jurisdiction es

** Other Sources:

(X) Denotes juri

Figure 3-44:

HEXACHLOROETHANE
1996 Estimated Emissions* by Source Category for Point and Area Sources



SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2899	Chemical preparations, nec	50.00						X			
3365	Aluminum foundries	826.00		X							

Total Estimated
Emissions: 876.00 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.

** Other Sources: Individually less than five percent of the total.

(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-45:

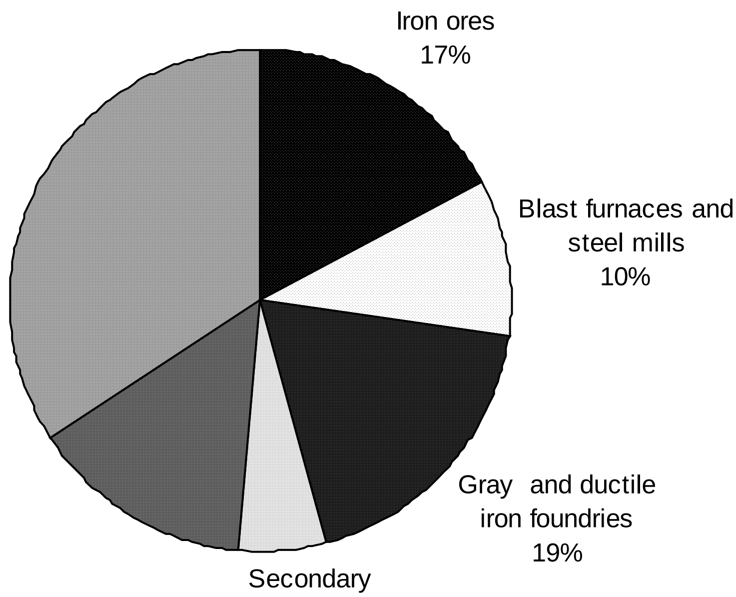
SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3089	Plastics products, nec	398.00					X				
3861	Photographic equipment and supplies	43.00					X				
-------	Other Sources**	38.84					X	X	X		X

Figure 3-46:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

Figure 3-47:

LEAD
1996 Estimated Emissions* by Source Category for Point and Area Sources

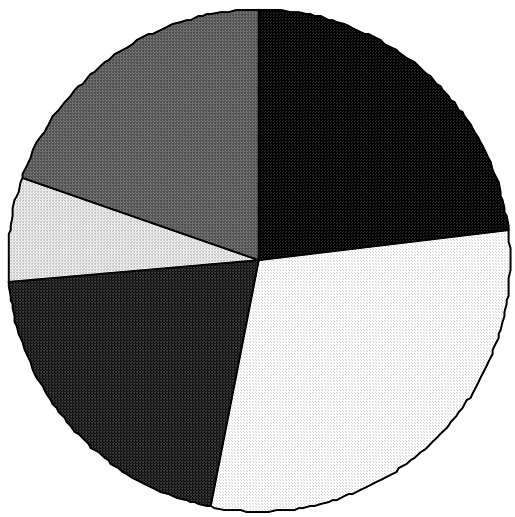


SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
1011	Iron ores	140,249.73			X	X			X		
3312	Blast furnaces and steel mills	80,929.68	X	X	X	X	X	X			X
3321	Gray and ductile iron foundries	152,167.76	X	X	X	X		X			X
3341	Secondary nonferrous metals	42,970.50	X	X	X	X	X	X	X	X	X
4911	Electric services	117,813.18	X	X	X	X	X		X		X
-------	Other Sources**	278,177.35	X	X	X	X	X	X	X		X

Total Estimated Emissions: 812,308.21 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.
** Other Sources: Individually less than five percent of the total.
(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-48:



SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3241	Cement, hydraulic	752,891.65	X	X	X		X			X	
3312	Blast furnaces and steel mills	976,500.90	X	X	X	X	X	X	X	X	X
3313	Electrometallurgical products	668,204.00						X			
3321	Gray and ductile iron foundries	214,689.86	X	X	X	X		X		X	X
-------	Other Sources**	639,390.39	X	X	X	X	X	X	X	X	X

Total Estimated Emissions: 3,251,676.81 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.
** Other Sources: Individually less than five percent of the total.
(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-49:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

Figure 3-50:

SIC	DESCRIPTION	EMISSIONS (L
2511	Wood household furniture	2,408
2752	Commercial printing, lithographic	3,575
3089	Plastics products, nec	4,158
3321	Gray and ductile iron foundries	11,033
3599	Industrial machinery, nec	5,193
3716	Motor homes	7,440.
-------	Other Sources**	10,537.

Total Estimated Emissio[illegible] lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.

** Other Sources: Individually less than five percent of the total.

(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-51:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2834	Pharmaceutical preparations	1,912,930.56	X	X	X		X		X		X
3086	Plastics foam products	6,509,023.07	X	X	X	X			X		X
3861	Photographic equipment and supplies	1,994,064.70					X				
-------	Architectural surface coatings	5,187,767.64	X	X	X	X	X	X	X		X
-------	Consumer and Commercial Solvent Use	2,016,996.73	X	X	X	X	X				X
-------	Solvent cleaning	7,278,216.56	X	X	X	X				X	X
-------	Other Sources**	7,568,280.80	X	X	X	X	X		X		X

Total Estimated Emissions: 32,467,280.08 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.

** Other Sources: Individually less than five percent of the total.

(X) Denotes

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Figure 3-52:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Autobody refinishing	2,253,594.15	X	X	X	X	X	X		X	X
-------	Consumer and Commercial Solvent Use	2,554,555.31	X	X	X	X	X				X

Figure 3-53:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3312	Blast furnaces and steel mills	159,155.32	X	X	X	X	X	X		X	X
4911	Electric services	116,721.05	X	X	X	X	X		X	X	X

Figure 3-55:

Figure 3-56:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

Figure 3-58:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Solvent cleaning	12,335,579.10	X	X	X	X				X	X

Figure 3-60:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2865	Cyclic crudes and intermediates	348,095.00						X			
2869	Industrial organic chemicals, nec	472,777.41	X	X	X		X	X	X		X
2899	Chemical preparations, nec	389,838.54	X		X				X		
3296	Mineral wool	730,988.06		X	X		X	X			
3312	Blast furnaces and steel mills	602,499.30		X			X	X	X		

Figure 3-61:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2821	Plastics materials and resins	33.00		X				X			
2833	Medicinals and botanicals	160.00		X							
-------	Other Sources**	1.76	X				X				

Figure 3-62:

Figure 3-63:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI		
2821	Plastics materials and resins	2,316,316.31	X	X	X	X	X	X	X	X	X	X	X

Figure 3-64:

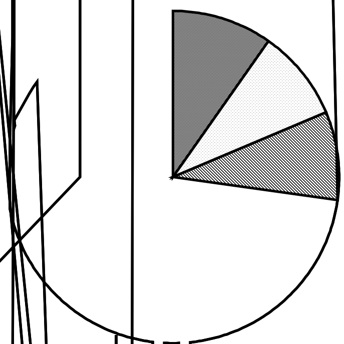
SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
4911	Electric services	0.31	X	X	X	X	X				X
-------	Other Sources**	0.02	X	X	X	X	X		X		X

Total Estimated Emissions: 0.33 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.

** Other Sources: Individually less than five percent of the total.

Figure 3-65:



SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2621	Paper mills	23.72			X						
-------	Other Sources**	3.21	X	X	X	X	X		X		X
2899	Chemical preparations, nec	2.87	X		X						
2493	Reconstituted wood products	2.80			X	X					

Total Estimated Emissions: 32.64 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.
** Other Sources: Individually less than five percent of the total.
(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-66:

[redacted]

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Consumer and Commercial Solvent Use	21,453,891.50	X	X	X	X	X				X
-------	Solvent cleaning	37,926,911.12	X	X	X	X				X	X
-------	Other Sources**	2,090,768.57	[redacted]								X

[redacted]

Figure 3-67:

Figure 3-68:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
0	Unknown	2,638.00					X				
2891	Adhesives and sealants	750.00						X			
3086	Plastics foam products	2,641.52	X	X							X
-------	Graphic arts	4,468.28					X				
-------	Other Sources**	422.00		X		X	X	X			X

Figure 3-69:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
3494	Valves and pipe fittings, nec	3,574,025.00	X							X	X

Figure 3-71:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

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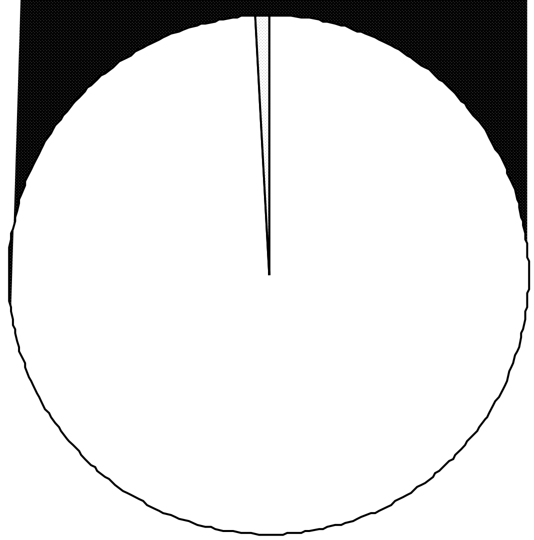

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI

Total Estimated Emissions: 662,346.08 lbs.

* Each jurisdiction estimated emissions for those sources for which they had data available.
** Other Sources: Individually less than five percent of the total.
(X) Denotes jurisdictions that have contributed emissions data for this pollutant.

Figure 3-73:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
2821	Plastics materials and resins	145,875.06	X						X		

Figure 3-74:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Degreasing	279,266.48		X	X	X					X
-------	Gasoline marketing	351,409.22				X			X		X
-------	Industrial surface coating	102,280.13		X		X					X
-------	Other Sources**	77,952.87		X	X	X	X	X	X	X	

Figure 3-75:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Architectural surface coating	4,035,705.32							X	X	
-------	Gasoline marketing	4,090,117.72				X			X	X	X
-------	Industrial surface coating	5,427,070.30		X	X	X				X	X
-------	Residential wood combustion	5,610,026.07		X	X	X		X	X		X
-------	Other Sources**	819,110.60		X	X	X	X		X	X	X

Figure 3-76:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI
-------	Degreasing	279,266.48		X	X	X					X
-------	Gasoline marketing	136,045.13				X			X		X
-------	Industrial surface coating	68,207.74		X		X					X
-------	Other Sources**	3,086.21									

Figure 3-77:

SIC	DESCRIPTION	EMISSIONS (LB)	IL	IN	MI	MN	NY	OH	ON	PA	WI		
3711	Motor vehicles and car bodies	12,506,168.82	X	X	X	X	X	X	X		X		
-------	Architectural surface coating	7,248,807.21	X	X	X	X	X	X	X	X	X	X	X

4. Conclusion

Air regulatory agencies in the eight Great Lakes states and province of Ontario agree that a collaborative effort is vital to successfully implementing a compatible database of airborne toxic pollutant emissions for the Great Lakes region. They have been working cooperatively toward this goal since 1987. As quality controlled and quality assured emissions inventories are developed and refined, the states, province of Ontario and the U.S. Environmental Protection Agency can work separately and in concert to define and regulate sources; evaluate control technology; establish guidelines for siting new facilities; and reduce airborne deposition of persistent toxic chemicals to the Great Lakes.

Realizing that mobile sources are a critically important category of air toxic emission sources relevant to human activities in industrialized societies, a mobile source emissions estimation module is now integrated into RAPIDS. This expansion of RAPIDS provides a more complete profile for toxic air emissions and will expand the list of toxic compounds of concern from 49 to 82.

Annual Great Lakes Toxic Air Emissions Inventories are available online through the Great Lakes Information Network. Also available through GLIN is AirMapper, where users can view a geographic representation of the inventory of pollutant concentrations and eventually point sources. Using GLIN's dissemination functions as a tool, decision makers and the general public will be able to make better informed decisions that help reduce toxic pollution, protect and restore habitats and support intergovernmental partnerships. Timely access to a comprehensive inventory will provide the foundation for sound public policy decisions.

This emissions inventory will assist in the successful implementation of key provisions of the Great Lakes Toxic Substances Control Agreement, signed by the Great Lakes governors and Premier of Ontario in 1986. In addition, this work is consistent with the state activities for the implementation of the Urban Area Source Program required under sections 112(c) and 112(k) of the Clean Air Act Amendments of 1990, and the assessment of atmospheric deposition to the Great Lakes under the efforts of U.S. EPA's Great Waters Program.

Further Refinements and Cooperative Efforts

The air regulatory agencies in the eight Great Lakes states and the province of Ontario have developed a system that can create a reliable and technically accurate inventory of estimated air toxic emissions. These inventories are to be used by the air agencies in coordination with ambient air quality data collected by the Great Lakes Monitoring Network to assess the contribution to airborne toxic impacts on the Great Waters and support the development of remedial action and other management plans.

While the states and Ontario are committed to compiling periodic inventories to assess and analyze the contribution of toxic air emissions on the Great Waters, these inventories can also serve a number of other very important purposes as well.

1. The NTI and the CEP;
2. Regional inventories for ozone, particulate matter and haze;
3. The urban air toxic program;
4. Mercury deposition studies; and,
5. Acid deposition studies.

The Great Lakes Regional Air Toxic Emissions Inventory is an example of regional cooperation of eight states and the province of Ontario. It can be used as a model for states compiling inventories for input into the National Toxics Inventory (NTI) or National Emissions Trends Inventory. It also serves as a model for the regional inventory efforts underway as part of a regional assessment of various toxic pollutants.

Autobody Refinishing

Chrome Plating

Consumer Solvent Use

Dry Cleaning

Gasoline Marketing

Monthly Gasoline

Reported by States 1996

Industrial Surface Coating

Landfills

Pesticides

Agricultural Chemical Usage 1996

Field Crops Summary

Publicly Owned Treatment Works (POTWs)

Residential Fuel Combustion

State Energy Data Report 1996

Residential Wood Combustion

State Energy Data Report 1996

Solvent Cleaning

	Fayette	Ford	Franklin	Fulton	Gallatin

	Greene	Grundy	Hamilton	Hancock	Hardin
ACENAPHTHEN	186.21	29.17	168.89	207.59	167.18
ACENAPHTHYL	595.88	87.73	540.46	664.28	503.39
ACETALDEHYDE	15.29	141.30	10.40	28.49	6.55
ACROLEIN	18.24	166.63	10.80	33.92	7.80
ACRYLAMIDE					
ACRYLONITRIL		1218.04			
ANTHRACENE	167.59	24.77	152.00	186.83	144.19
ANTIMONY		437.23	0.04		
ARSENIC	0.22	109.99	0.21	0.31	0.19
ATRAZINE	15702.74	17072.00	8755.46	22691.06	311.66
BENZ(A)ANTHR	24.03	3.72	20.86	26.34	19.36
BENZ(GHI)PE	372.42	55.00	337.78	415.17	311.98
BENZENE	38648.41	15440.80	34755.44	45060.96	34347.52
BENZO(A)PYRE	112.11	16.45	101.33	124.81	93.65
BENZO(B)FLUO	74.48	10.96	67.56	83.03	64.51
BENZO(K)FLUO	18.62	2.74	16.89	20.76	15.60
BERYLLIUM	0.13	2.34	0.12	0.15	0.12
BUTADIENE,13	0.20	0.51	0.19	0.28	0.06
CADMIUM	1.15	33.48	0.88	1.40	0.82
CARBON TETRA	44.17	48.42	23.86	46.84	14.59
CHLOROFORM	55.00	140.78	28.84	82.38	21.96
CHROMIUM	3.20	71.01	2.90	3.79	2.62
CHROMIUM VI	0.01	20.65		0.01	negl
CHRYSENE	189.15	27.61	168.89	209.57	156.09
COBALT	negl	501.34	0.02	negl	
COKE OVEN GS					

[redacted]

	Jefferson	Jersey	Jo Daviess	Johnson	Kane
ACENAPHTHEN	444.27	273.69	250.71	222.10	86.69
ACENAPHTHYL	1421.41	875.81	802.26	710.70	277.33
ACETALDEHYDE	52.86	18.80	43.48	10.83	375.05
ACROLEIN	62.93	22.44	49.96	12.93	449.56
ACRYLAMIDE					
ACRYLONITRIL		65.41			753.51
ANTHRACENE	399.78	246.32	225.64	199.88	78.00
ANTIMONY	20.20				6.12
ARSENIC	12.53	0.33	0.39	174.68	7.02
ATRAZINE	7659.88	9192.44	14123.20	2333.58	14909.82
BENZ(A)ANTHR	69.91	33.80	31.24	27.43	119.18
BENZ(GHI)PE	888.39	547.38	501.41	444.19	173.33
BENZENE	98220.28	56522.16	53457.32	46950.00	75176.87
BENZO(A)PYRE	270.01	164.22	151.14	133.26	183.63
BENZO(B)FLUO	177.68	109.48	100.28	88.84	34.67
BENZO(K)FLUO	44.42	27.37	25.07	22.21	8.67
BERYLLIUM	0.44	0.20	0.19	0.16	2.98
BUTADIENE,13	0.51	0.27	0.28	0.17	4.83
CADMIUM	6.32	1.41	2.55	15.02	2088.03
CARBON TETRA	48.15	38.17	44.18	31.25	247.54
CHLOROFORM	158.42	81.06	82.86	51.98	1575.72
CHROMIUM	105.47	4.55	5.83	3.69	766.27
CHROMIUM VI	1.02	negl	negl	negl	572.75
CHRYSENE	472.15	273.69	250.71	222.10	182.44
COBALT	23.17	negl	negl		7.00
COKE OVEN GS					
COPPER	11.77	4.30	10.39	3.49	214.09
DIBENZAHAN	177.68	109.48	100.28	88.84	34.67
DIBROMOET,12	negl				0.01
DIBUTYL PHTH	2.70				533.68
DICHLORETH12	0.66	8.00	0.11	0.06	94.34
DIEYLHEX PHT					
ETHYLBENZENE	18488.09	6271.41	7942.93	6463.41	142219.09
ETHYLENE OXI	606.90	310.21	348.30	182.56	14872.96
FLUORANTHENE	455.07	219.02	200.83	177.71	422.88
FLUORENE	621.88	383.17	350.99	310.93	121.35
FORMALDEHYDE	1789.78	548.73	1992.78	454.62	26070.26
GLYCOL ETHRS	1565.34	829.98	931.87	488.44	14170.10
HEXCLBENZENE	negl	negl	0.01	negl	0.01
INDN(123CDPY	888.39	547.38	501.41	444.19	173.33
LEAD	26.45	0.70	5386.10	116.76	693.50
MANGANESE	19.62	4.93	3633.43	4.02	72.23
MERCURY	38.28	11.76	30.39	7.45	267.98
METHENE(B)4-					509.00
METHYLENE CL	6764.24	3126.18	6186.28	141701 311039 0.48 -0.48 ref201 312 0.(963	

	Kankakee	Kendall	Knox	Lake	LaSalle
ACENAPHTHEN	97.17	37.09	150.36	93.64	175.01
ACENAPHTHYL	310.89	118.68	481.11	299.20	570.26
ACETALDEHYDE	196.80	50.02	100.90	1033.96	215.25
ACROLEIN	207.84	59.64	119.84	827.34	218.84
ACRYLAMIDE					
ACRYLONITRIL	112.43		106.25	1352.97	151.36
ANTHRACENE	87.43	33.38	135.31	84.42	157.53
ANTIMONY	1.80		3.73	12.72	0.90
ARSENIC	1.02	6.06	1.31	136.59	35.57
ATRAZINE	27953.46	13192.00	24375.58	939.30	44232.00
BENZ(A)ANTHR	21.05	4.74	18.70	72.20	27.32
BENZ(GHI)PE	194.28	74.17	300.69	185.64	349.91
BENZENE	37133.27	15921.36	40362.68	132599.77	62877.75
BENZO(A)PYRE	70.71	22.48	90.21	61.39	107.73
BENZO(B)FLUO	38.86	14.83	60.134	37.17	70.03
BENZO(K)FLUO	9.72	3.71	15.03	9.34	17.51
BERYLLIUM	0.14	0.50	0.92	9.22	3.13
BUTADIENE,13	1.32	0.62	0.72	26.70	44402.99
CADMIUM	15.07	22.93	3.16	55.92	13.17
CARBON TETRA	89.96	41.20	318.22	401.44	138.59

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	Mercer	Monroe	Montgomery	Morgan	Moultrie
ACENAPHTHEN	116.09	185.05	199.55	154.27	43.18
ACENAPHTHYL	371.51	592.16	638.47	465.48	138.18
ACETALDEHYDE	18.15	42.09	71.11	77.28	44.33
ACROLEIN	19.67	27.82	57.79	89.24	21.07
ACRYLAMIDE					
ACRYLONITRIL			340.88		17.46
ANTHRACENE	104.50	166.56	179.58	133.24	38.88
ANTIMONY		0.60	24.94	17.30	0.74
ARSENIC	0.19	0.51	568.60	194.23	0.24
ATRAZINE	19404.14	7077.60	23654.12	20041.68	13354.94
BENZ(A)ANTHR	15.94	22.85	25.22	49.97	5.79
BENZ(GHI)PE	232.18	370.03	399.04	288.60	86.26
BENZENE	25691.81	40638.94	50921.58	38581.79	11510.46
BENZO(A)PYRE	70.24	111.02	119.90	93.05	26.04
BENZO(B)FLUO	46.44	74.01	79.81	59.59	17.25
BENZO(K)FLUO	11.61	18.50	19.95	14.43	4.32
BERYLLIUM	0.08	0.15	29.32	3.00	0.06
BUTADIENE,13	0.23	1.39	0.40	0.47	1.70
CADMIUM	1.12	1.62	645.98	23.42	0.50
CARBON TETRA	44.59	40.09	52.52	45.37	23.95

	Rock Island	St. Clair	Saline	Sangamon	Schuyler
ACENAPHTHEN	154.80	400.33	199.52	159.61	139.46
ACENAPHTHYL	495.48	1280.94	638.46	510.61	446.28
ACETALDEHYDE	220.35	309.86	28.05	757.33	9.33
ACROLEIN	242.26	344.24	33.43	309.69	11.11
ACRYLAMIDE					
ACRYLONITRIL	1041.43	963.22	127.33	45.05	
ANTHRACENE	139.43	360.27	179.56	143.97	125.52
ANTIMONY	0.09	6.68		17.74	
ARSENIC	58.39	63.57	0.40	58.94	0.19
ATRAZINE	10868.50	13628.40	7164.04	31824.82	9650.12
BENZ(A)ANTHR	53.46	58.83	25.23	111.90	17.22
BENZ(GHI)PE	309.58	800.52	399.04	317.18	278.93
BENZENE	58003.01	234563.02	43444.60	70368.00	29140.68
BENZO(A)PYRE	104.59	243.65	119.93	128.44	83.68
BENZO(B)FLUO	61.92	160.11	79.81	63.47	55.78
BENZO(K)FLUO	15.48	40.03	19.95	15.95	13.95
BERYLLIUM	0.46	3.73	0.18	1.78	0.10
BUTADIENE,13	2.12	4.14	0.34	30.44	0.10
CADMIUM	19.49	43.48	1.74	31.44	0.88
CARBON TETRA	1215.42	224.28	51.50	150.02	21.58

	Scott	Shelby	Stark	Stephenson	Tazewell
ACENAPHTHEN	56.90	243.86	32.64	119.31	245.55
ACENAPHTHYL	182.02	780.35	104.46	381.79	785.56
ACETALDEHYDE	27.81	21.74	6.36	75.24	228.56
ACROLEIN	9.23	25.94	7.59	89.51	247.22
ACRYLAMIDE					
ACRYLONITRIL				68.42	578.38
ANTHRACENE	51.21	219.47	29.38	107.38	220.98
ANTIMONY	0.64			0.08	15399
ARSENIC	0.21	0.46	0.07	0.41	467.93
ATRAZINE	8083.18	25828.00	14278.40	22355.82	23447.08
BENZ(A)ANTHR	7.02	31.30	4.03	26.00	128.04

	Wayne	White	Whiteside	Will	Williamson
ACENAPHTHEN	328.52	164.54	144.33	151.54	376.96
ACENAPHTHYL	1051.26	516.06	461.81	484.98	1206.01
ACETALDEHYDE	28.87	22.80	49.04	1337.50	169.53
ACROLEIN	27.88	21.97	49.13	990.93	130.12
ACRYLAMIDE					
ACRYLONITRIL	160.50		31.87	1235.02	87.08
ANTHRACENE	295.67	146.01	129.87	136.64	339.22
ANTIMONY	0.17	0.13		51.34	66.52
ARSENIC	1.12	0.32	20.60	808.45	1523.46
ATRAZINE	14669.08	12358.72	33838.82	15539.62	3266.04
BENZ(A)ANTHR	41.74	19.96	26.12	70.89	52.52
BENZ(GHI)PE	657.02	321.64	288.59	301.76	753.73
BENZENE	68624.06	36613.80	41637.44	226387.33	88495.33
BENZO(A)PYRE	197.52	96.61	90.40	3689.44	228.32

	Winnebago	Woodford	State Total
ACENAPHTHEN	189.94	122.12	17,738.77
ACENAPHTHYL	607.83	390.80	56,661.97
ACETALDEHYDE	414.33	32.60	17,373.01
ACROLEIN	419.30	38.89	16,981.94
ACRYLAMIDE			390.04
ACRYLONITRIL	169.97		24,799.43
ANTHRACENE	170.99	109.91	15,943.57
ANTIMONY	2.85		1,320.94
ARSENIC	2.07	0.20	10,402.53
ATRAZINE	14444.58	21114.22	1,710,115.46
BENZ(A)ANTHR	47.47	15.51	7,219.44
BENZ(GHI)PE	379.71	244.25	35,390.08
BENZENE	101158.47	31667.71	2,742,206.46
BENZO(A)PYRE	126.07	73.43	35,565.85
BENZO(B)FLUO	75.94	48.85	7,084.77
BENZO(K)FLUO	18.99	12.21	1,769.91
BERYLLIUM	0.84	0.09	521.04
BUTADIENE,13	5.96	0.45	52,308.73
CADMIUM	77.52	1.88	5,238.50
CARBON TETRA	200.50	53.59	5,725.73
CHLOROFORM	1131.15	132.35	13,636.38
CHROMIUM	334.53	2.31	77,967.67
CHROMIUM VI	277.30	negl	15,342.60
CHRYSENE	251.52	123.34	24,035.78
COBALT	2.29	negl	1,733.93
COKE OVEN GS			1,151,548.62
COPPER	2643.97	2.25	542,844.92
DIBENZAHAN	75.96	48.85	7,079.11
DIBROMOET,12	negl	negl	35.30
DIBUTYL PHTH	52.18		6,539.36
DICHLORETH12	22.79	0.17	6,097.20
DIEYLHEX PHT			2,420.02
ETHYLBENZENE	88297.90	14571.51	4,959,804.98
ETHYLENE OXI	4404.93	492.94	343,709.99
FLUORANTHENE	380.35	102.28	29,324.14
FLUORENE	267.66	170.97	24,870.06
FORMALDEHYDE	12859.10	923.24	12,288,429.91

GLYCOL ETH 42(4.16 Tm-7422.94)-56711318.86.94

Code	Pollutant Name
ACENAPHTHEN	Acenapthene
ACENAPHTHYL	Acenaphthylene
ACETALDEHYDE	Acetaldehyde
ACROLEIN	Acrolein
ACRYLAMIDE	Acrylamide
ACRYLONITRIL	Acrylonitrile
ANTHRACENE	Anthracene
ANTIMONY	Antimony
ARSENIC	Arsenic
ATRAZINE	Atrazine
BENZ(A)ANTHR	Benz(a)anthracene
BENZ(GHI)PE	Benz(g,h,i)perylene
BENZENE	Benzene
BENZO(A)PYRE	Benzo(a)pyrene
BENZO(B)FLUO	Benzo(b)fluoranthene
BENZO(K)FLUO	Benzo(k)fluoranthene
BERYLLIUM	Beryllium
BUTADIENE,13	1,2-Butadiene
CADMIUM	Cadmium
CARBON TETRA	Carbon Tetrachloride
CHLOROFORM	Chloroform
CHROMIUM	Chromium
CHROMIUM VI	Hexavalent Chromium
CHRYSENE	

Appendix B: Indiana Toxic Emissions Inventory

AREA SOURCES

Consumer and Commercial Solvent Use

-

Agricultural Pesticide Use

Commercial/Industrial Dry Cleaning Operations

Industrial Surface Coatings

Municipal Solid Waste Landfills

Public Owned Treatment Works (Potws)

Residential Distillate Oil Combustion

Residential Natural Gas Combustion

[redacted]

[redacted]

	Decatur	Dekalb	Delaware	Dubois	Elkhart
1,1,1-TRICHLOROETHANE	52486	74842	189638	96980	566129.7
1,2-DIBROMOETHANE					
1,2-DICHLOROETHANE	0.1	0.2	0.6	0.2	53.8
1,3-BUTADIENE			28.01		0.03
TCDD,2378				0.00000108	0.00000021
TCDF,2378					
ACENAPHTHENE	46.01	36	45.01	55.1	79.12
ACENAPHTHYLENE	516	407	505.01	627.21	901.25
ACETALDEHYDE			0.2	117.5	17.53
ACROLEIN			0.03	29.11	0.09
ACRYLONITRILE				28	437

	Gibson	Grant	Greene	Hamilton	Hancock
1,1,1-TRICHLOROETHANE	47230	136506	29809	143441.01	60523.01
1,2-DIBROMOETHANE	10			0.0009	0.0009
1,2-DICHLOROETHANE	306.1	0.3	0.2	0.73	2.33
1,3-BUTADIENE					0.09
TCDD,2378	0.00011			0.0000009	
TCDF,2378	0.00039			0.000003	
ACENAPHTHENE	26.9	39	67	29.01	19.01
ACENAPHTHYLENE	264.9	439	758	334.01	216.01
ACETALDEHYDE	4366			0.3	2.2
ACROLEIN	2221			0.19	0.22
ACRYLONITRILE					13
ANTHRACENE	32.7	52	89	39.01	25.01
ANTIMONY	139	0.03		0.01	
ARSENIC	3144.11	26.15	0.6	1.78	0.72
ATRAZINE	46621	26188	21684	25103	26563
BENZ(A)ANTHRACENE	93.51	155	267	118.01	83.01
BENZENE	28311.2	24380.32	20513.2	24000.6	10884.4
BENZO(A)PYRENE	15.29	26	45	20	14.2
BENZO(B)FLUORANTHENE	15	26	45	20	13
BENZO(G,H,I)PERYLENE	8.21	13	22	10	6
BENZO(K)FLUORANTHENE	8	13	22	10.01	6
BERYLLIUM	167.22	1.13	6.21	0.95	0.92
CADMIUM	395.28	264.03	2.3	12.23	4.84
CARBON TETRACHLORIDE	3	3	3	3	2.03
CHLOROFORM	484	73	33	146.03	52.11
CHROMIUM	2023.19	10.78	31.07	307.32	95.58
CHROMIUM (VI)	605			0.06	0.02
CHRYSENE	39.8	65	111	49.01	42
COBALT	766.04	0.15	0.2	0.11	0.2
COKE OVEN EMISSIONS					
COPPER	250.42	32.71	2	11.5	12
DIBENZO(A,H)ANTHRACENE	8	13	22	10	6
DIBUTYL PHTHALATE	6	29	5	44	8.6
DIETHYLHEXYL PHTHALATE					
DIOCTYL PHTHALATE	560			0.06	
ETHYLBENZENE	6387	11980	4799	17861.06	10680.36
ETHYLENE GLYCOL		163		710	2709
ETHYLENE OXIDE	484	1109	497	2231	785

FLU()-1391 416.76 66.72 -0.48 ref295.6

	Jackson	Jasper	Jay	Jefferson	Jennings
1,1,1-TRICHLOROETHANE	86275	48028	29841	42232	31738
1,2-DIBROMOETHANE		5			
1,2-DICHLOROETHANE	54.2	170.1	0.1	0.1	8.1
1,3-BUTADIENE	4				
TCDD,2378					
TCDF,2378					
ACENAPHTHENE	83	21.2	30	54	67
ACENAPHTHYLENE	944	219	335	616	760
ACETALDEHYDE	65	2523			
ACROLEIN	3	1235			
ACRYLONITRILE	447				67
ANTHRACENE	111	26.9	39	73	89
ANTIMONY		77			
ARSENIC	0.7	1816.3	0.3	2831.5	76.59
ATRAZINE	30983	65678	19682	6255	14887
BENZ(A)ANTHRACENE	333	77.31	118	218	268
BENZENE	32243.2	19363.1	10154.1	18205.1	20153.7
BENZO(A)PYRENE	56	13.16	20	988	45
BENZO(B)FLUORANTHENE	56	13	20	36	45
BENZO(G,H,I)PERYLENE	28	6.09	10	18	22
BENZO(K)FLUORANTHENE	28	6	10	18	22
BERYLLIUM	0.71	90.51	2.11	426.71	0.81
CADMIUM	2.5	225.1	1.3	1592.88	8.3

	Laporte	Lawrence	Madison	Marion	Marshall
1,1,1-TRICHLOROETHANE	185165	67577	175257	1195475.5	82701
1,2-DIBROMOETHANE	2			1.75	
1,2-DICHLOROETHANE	58.5	0.2	19.6	420.08	0.2
1,3-BUTADIENE	2.3			2.35	
TCDD,2378	0.00002			3.32E-05	
TCDF,2378	0.00007			3.10E-05	
ACENAPHTHENE	44.89	115	44.01	40.02	45
ACENAPHTHYLENE	500.76	1299	494.01	446.24	514
ACETALDEHYDE	876	126.09		3296.89	360
ACROLEIN	428.8			501.59	
ACRYLONITRILE			153	3009	
ANTHRACENE	59.42	153	58.01	52.85	60
ANTIMONY	31	0.4		447.51	0.1
ARSENIC	711.56	10.09	177.9	807.52	92.31
ATRAZINE	27105	9091	37488	3962	38322
BENZ(A)ANTHRACENE	177.2	459.01	175.01	168.8	181
BENZENE	30585.5	34601.8	35990.63	178602	21122.2
BENZO(A)PYRENE	29.08	76	29	620.11	30
BENZO(B)FLUORANTHENE	29.01	76	29.01	26.07	30
BENZO(G,H,I)PERYLENE	15.07	38	15	13.12	15
BENZO(K)FLUORANTHENE	15.02	38	15.01	13.06	15
BERYLLIUM	32.94	1.15	1.21	44.25	2.5
CADMIUM	143.5	12.8	17.5	242.06	73.5
CARBON TETRACHLORIDE	4	2	3.3	10.01	3
CHLOROFORM	195	45	133	2411.01	45
CHROMIUM	2776.14	52.6	8489.04	6310.96	113.75
CHROMIUM (VI)	115	0.06	161	130.19	
CHRYSENE	74.23	191.01	73.01	77.13	76
COBALT	332	0.3	767.08	892.24	434.2
COKE OVEN EMISSIONS				64896	
COPPER	1168	162.3	1471.8	15495.57	37.6
DIBENZO(A,H)ANTHRACENE	15.04	38	15	13.07	15
DIBUTYL PHTHALATE	29	39.7	51	218.04	11
DIETHYLHEXYL PHTHALATE	515.4				
DIOCTYL PHTHALATE	107	69		179	40
ETHYLBENZENE	20967	7527	18960	115825.2	15737
ETHYLENE GLYCOL	349	108	5350	10328.8	158
ETHYLENE OXIDE	1655	685	2005	12345	682
FLUORANTHENE	89.47	229.03	87	138.02	91.08
FLUORENE	105.34	267.01	102	95.65	106.08
FORMALDEHYDE	5225	1086	1177.4	120008.14	5633.04
GLYCOL ETHERS (MISC.)	309476	3942	132184	203335	52091
HEXACHLORO-1,3-BUTADIENE					
HEXACHLOROETHANE					
INDENO(1,2,3-C,D)PYRENE	29.14	76.01	29	26.13	30.05
LEAD	4237.38	844.2	415	17709.56	924.91
MANGANESE	19425.3	27995.6	6866.33	15081.11	7537.2
MERCURY	158.58	168.87	0.92	914.87	7.7
METHYLENE CHLORIDE	145976	14790	38481	401232.06	38731
METHYLENE(B)4-PHENYLISOCYANATE	5280			3576	1120
M-XYLENE	1851	795	1727	14624.87	2138
NAPHTHALENE	17503.8	7214	15083.6	75559.94	5428
NICKEL	4456.42	55.14	1565.02	2771.29	198.1
O-XYLENE	14058	8010	7675	44012.53	8048
PHENANTHRENE	3603.59	9342.07	3556.02	3209.79	3696.5
PHENOL	33129	80		5784.49	1200
PHOSGENE					
PCBS					
PCDD	0.004	0.0015		0.08	0.002
PCDF	0.01	0.01		0.21	0.01
P-XYLENE	1620	679	1576	10480.27	877
PYRENE	74.84	191.02	73	66.05	76.1
STYRENE	729	64.2	107	16304.9	761123
TETRACHLOROETHYLENE	95292	34578	189789	1085788.01	36158
TOLUENE	265396	116135	366836	1638658.94	376341
TOLUENE-2,4-DIISOCYANATE	46				
TRICHLOROETHYLENE	118088	47351	121809	956181	79230
TRIFLURALIN					
VINYL CHLORIDE			221	1153.2	
XYLENES (MIXED ISOMERS)	236295.9	83449	322293	1086927.01	200297

	Martin	Miami	Monroe	Montgomery	Morgan
1,1,1-TRICHLOROETHANE	14665	43970.02	150447	59861	76653
1,2-DIBROMOETHANE		0.0012			0.44
1,2-DICHLOROETHANE	0.05	0.25	23.5	0.2	14.3
1,3-BUTADIENE	20				

	Union	Vanderburgh	Vermillion	Vigo	Wabash
1,1,1-TRICHLOROETHANE	2843	240557.06	16596.06	132774.3	56567
1,2-DIBROMOETHANE		0.01	3.08	1.42	
1,2-DICHLOROETHANE	0.03	2.04	98.48	94.21	51.2
1,3-BUTADIENE		26		0.04	
TCDD,2378		0.0000004	0.0000009	0.000008201	
TCDF,2378			0.000003	0.000031903	
ACENAPHTHENE	10	21.06	17.34	53.63	27
ACENAPHTHYLENE	110	241.51	182.63	596.36	309
ACETALDEHYDE		32	1390	26685.63	
ACROLEIN		0.04	708	349.48	13
ACRYLONITRILE				376	423

	Warren	Warrick	Washington	Wayne	Wells
1,1,1-TRICHLOROETHANE	3519	56105.3	38114	107191	31786
1,2-DIBROMOETHANE		4.21		0.3	
1,2-DICHLOROETHANE	0.04	141.8	12.1	12.3	0.1
1,3-BUTADIENE		1.91			
TCDD,2378		0.0000452	0.00000019	0.00000409	
TCDF,2378		0.0001747	0.0000001	0.000015	
ACENAPHTHENE	16	22.85	96.02	46.16	18
ACENAPHTHYLENE	180	241.91	1090.22	518.18	207
ACETALDEHYDE		2040.2	13.5	168	
ACROLEIN		1039.02	0.12	82.01	
ACRYLONITRILE		16	96		
ANTHRACENE	21	28.77	128.2	61.15	24
ANTIMONY		88.3		5	
ARSENIC	0.3	1481.25	2.52	150.1	0.7
ATRAZINE	41116	16972	15846	23144	22226

Appendix C: Michigan Toxic Emissions Inventory

Architectural Surface Coating

Dry Cleaning

Consumer and Commercial Solvent Use

Solvent Cleaning/Cleanup

Recommended Method for Solvent Cleaning Equipment

Graphic Arts

Industrial Surface Coating

Pesticides – Agricultural and Non-agricultural

Gasoline Marketing (Stage I and II)

Auto Body Refinishing

Landfills

Traffic Markings

	Alcona	Alger	Allegan	Alpena	Antrim

	Berrien	Branch	Calhoun	Cass	Charlevoix
ACENAPHTHEN	115.3427853	72.9020812	107.8061697	107.1635430	90.7886742
ACENAPHTHYL	1307.1892004	826.2073858	1221.8032568	1213.8410066	1027.7322633
ACETALDEHYDE	1.7892315				
ACROLEIN					
ACRYLONITRIL			181.1910019		
ANTHRACENE	153.7877471	97.2013055	143.7415596	142.8231251	120.9421770
ANTIMONY	0.0787500		4.0161634		
ARSENIC	4.6403422	0.0000561	8.7713347	0.0776585	202.3683857
ATRAZINE	34360.3846000	76270.0788000	65652.4624000	57219.3564000	1167.1970000

	Gladwin	Gogebic	Grand Traverse	Gratiot	Hillsdale
ACENAPHTHEN	80.1635621	59.8381153	111.2327168	61.3557487	87.9143325
ACENAPHTHYL	908.5203705	678.1653070	1260.5073875	695.3651517	996.3624347
ACETALDEHYDE					
ACROLEIN					
ACRYLONITRIL					
ANTHRACENE	106.8847495	79.7841538	148.2984917	81.8076649	117.2191100
ANTIMONY			0.0589500		
ARSENIC			2.5957557		695.6771232
ATRAZINE	4577.4796000	0.0000000	3574.8100000	66703.3704000	63027.7766000
BENZ(A)ANTHR	320.6542484	239.3524613	444.8834866	245.4229947	351.6573980
BENZ(GHI)PE	26.7211874	19.9460384	37.0736149	20.4519162	29.3047775
BENZENE	23664.8916651	19539.7999520	56923.4269353	24344.6906322	30081.8074953
BENZO(A)PYRE	53.4423747	39.8920769	74.1472903	3182.2400141	58.6096362
BENZO(B)FLUO	53.4423747	39.8920769	74.1494699	40.9038325	58.6095550
BENZO(K)FLUORANTHENE	26.7211874	19.9460384	37.0736149	20.4519162	29.3047775
BERYLLIUM			0.1528805		82.3998674
BUTADIENE,13	4889.2333637	7334.1354648	25377.0610625	13063.6433774	10986.9322300
CADMIUM	0.6145873	0.4587589	1.3187163	0.4703941	45.9233486
CARBON TETRA	0.0000101	0.0000072	0.0000295	0.0000164	0.0000188
CHLOROFORM	24.3686900	17.4604290	71.3985770	39.5418910	45.4393320
CHROMIUM	0.0133606	0.0099730	7.7540908	0.0102260	11.2972032
CHROMIUM VI			0.0028733		
CHRYSENE	133.6059368	99.7301922	185.3681822	102.2595811	146.5240574
COBALT			0.0681200		
COKE OVEN GS					
COPPER			0.2514176		0.0568009
DIBENZAHAN	26.7211874	19.9460384	37.0736149	20.4519162	29.3047775
DIBENZOFURAN	0.1984413	0.1421853	0.5814193	0.3220011	0.3700256
DIBROMOET,12	0.6961444	1.0442573	6.1863201	1.8600426	1.5643540
DIBUTYL PHTH	777.8293193	557.3230898	2278.9865767	1262.1458996	1450.3875539
DICHLORETH12	7.2634606	10.8059212	63.8302114	19.2872789	16.2784352
DIEYLHEX PHT					
DIOCTYL PHTH					
ETHYLBENZENE	2451.7375625	1728.2256371	7928.1186227	3986.8740318	5639.3438912
ETHYLENE OXI	371.3090000	266.0469000	1087.9097000	602.5051000	692.3652000
FLUORANTHENE	160.3271242	119.6762306	222.4498585	122.7114974	175.8297676
FLUORENE	187.0483116	139.6222691	259.5160213	143.1634136	205.1334424
FORMALDEHYDE	31.1761856	22.3380730	697.0872622	50.5880838	61.5161417

	Iron	Isabella	Jackson	Kalamazoo	Kalkaska
ACENAPHTHEN	63.4535817	80.9223788	121.9526807	98.7133069	71.1661643
ACENAPHTHYL	719.1429281	917.1202928	1382.1303810	1118.6090704	806.5498624
ACETALDEHYDE	29.5470004				18.5162640
ACROLEIN	0.0393960				
ACRYLONITRIL				487.9500122	
ANTHRACENE	84.9297172	107.8965050	162.6035742	131.6048866	94.8882191
ANTIMONY				44.4829856	
ARSENIC	0.3104031	0.1031150	0.3701283	220.3653293	
ATRAZINE	0.0000000	34370.7214000	55527.5668000	43095.8420.0448121	164.2(107.8965050)-3.044812

	Manistee	Marquette	Mason	Mecosta	Menominee
ACENAPHTHEN	79.2869232	137.9247366	80.0551597	91.6702770	86.4181989
ACENAPHTHYL	898.6571316	1563.1581428	907.2918101	1038.7714484	979.4408222
ACETALDEHYDE	40.5813965	29.1779995		1.2375000	18.9703809
ACROLEIN					

	Muskegon	Newaygo	Oakland	Oceana	Ogemaw
ACENAPHTHEN	155.3619662	153.4435729	112.7389758	84.4454562	86.9493110
ACENAPHTHYL	1761.1518688	1739.0271594	1277.5045165	957.0485039	985.3093916
ACETALDEHYDE	210.1380005	1.2656511	111.2109468		
ACROLEIN	0.2801840		0.1482368		
ACRYLONITRIL					
ANTHRACENE					

	Presque Isle	Roscommon	Saginaw	Saint Clair	Saint Joseph
ACENAPHTHEN	72.3123393	66.5153400	103.4723428	123.0641304	101.5188315
ACENAPHTHYL	819.4527459	753.7257218	1172.6616993	1393.8026830	1150.5467572
ACETALDEHYDE					
ACROLEIN					
ACRYLONITRIL					
ANTHRACENE	96.4085525	88.6767078	137.9608696	163.9813908	135.3584420
ANTIMONY			0.5302500	20.3100452	1.8014849
ARSENIC	0.0000218	0.0000331	54.4459863	220.0466864	4.7594008
ATRAZINE	2093.2020000	0.0000000	69001.5856000	88058.3378000	0.0000000
BENZ(A)ANTHR	289.2176294	266.0195424	413.8803182	491.9479783	406.0754674

ATRAZINEATRAZINE

	Washtenaw	Wayne	Wexford	Pollutant Totals
ACENAPHTHEN	58.5372867	65.4710003	89.8017633	7162.7500623
ACENAPHTHYL	663.4225829	738.9958000	1019.8410772	81176.1092753
ACETALDEHYDE	10.9576950		1390.3559570	11271.5058108
ACROLEIN			1.8538080	14.8961942
ACRYLONITRIL	474.4554977	411.7530060		2279.8753300
ANTHRACENE	78.0497156	86.9646019	135.2054454	9672.7037584
ANTIMONY	6.5211799	12.9089620		308.2088495
ARSENIC	66.5516627	82.2991990	0.8020470	7689.5120229
ATRAZINE	45349.2644000	3689.3762000	1589.2830000	1858748.7322000
BENZ(A)ANTHR	236.2297218	500.4771056	353.5759358	29525.1510634
BENZ(GHI)PE	19.5124289	21.7371398	29.4019534	2385.5813637
BENZENE	73608.4618579	241316.7587199	37389.8637927	3901477.2138795
BENZO(A)PYRE	39.0248578	4834.8398676	58.8784888	12989.1040981
BENZO(B)FLUO	39.0248578	43.4763555	58.7979026	4765.5827192
BENZO(K)FLUORANTHENE	19.5124289	21.7346778	29.3951128	2382.7024416
BERYLLIUM	2.1323001	4.2779807	39.9999991	1541.0665652
BUTADIENE,13	43085.8071133	223907.5484151	24866.4229856	1852608.0705286
CADMIUM	42.7483887	49.3076968	0.7729957	15899.0925701
CARBON TETRA	0.1899034	0.5237535	0.0000118	152.1442510
CHLOROFORM	293.6248936	2118.9004656	28.4575560	9646.8424372
CHROMIUM	211.7641753	917.0463156	0.7557593	16605.6716509
CHROMIUM VI	0.0000017	0.2807239	0.2622219	118.2941816
CHRYSENE	97.5621445	433.2094153	166.9043688	12808.8293881
COBALT	6.4127077	26.3878422	0.7410617	758.9752197
COKE OVEN GS		343173.8540039		343173.8540039
COPPER	101.8902092	1134.1771873	20.6497159	7495.8127162
DIBENZAHAN	19.5124289	21.7528710	29.3951128	2382.7846311
DIBENZOFURAN				

Appendix D: Minnesota Toxic Emissions Inventory

Source: U.S. Bureau of the Census

Data Acquisition

Point Sources

Area Sources

Activity Data Pre-Treatment

Source-Specific Emission Factors and Speciation Profiles

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Quality Control

Activity Data

Emission Factors

Emission Results

Quality Assurance

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Source Classification Code Assignment

Small Point Sources

Control Efficiencies

Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources

	Cass	Chippewa	Chisago	Clay	Clearwater
ACENAPHTHEN	269.2146046	35.80699951	149.2590866	128.2486733	91.88240234
ACENAPHTHYL	5707.331789	759.1083896	3164.142885	2718.754214	1947.90693
ACETALDEHYDE	0.545982814	0	4.586255638	3.603486572	58.44657
ACROLEIN	0.065845385	0	0.553101234	0.434579541	0
ACRYLONITRIL	47.9551	72.12806	158.4151	134.515	0
ANTHRACENE	376.9003624	50.12979932	208.9620156	179.5475883	128.6353633
ANTIMONY	0	0.140472033	0.6405	16.5375	0
ARSENIC	0.963706344	0.670855596	2.584865663	55.08529776	0.311053462
ATRAZINE	923.6272192	12115.8327	3069.706377	3622.071489	389.3714923
BENZ(A)ANTHR	538.5303147	71.66962591	298.6688209	256.715552	194.898119
BENZ(GHI)PE	107.6857856	14.3227998	59.70316224	51.29909818	36.75296094
BENZENE	56566.502	10062.8837	36149.13814	34027.89423	19284.53207
BENZO(A)PYRE	107.6855713	14.32279995	59.70136242	51.29768403	36.75296094
BENZO(B)FLUO	161.5282268	21.48419971	89.55094999	76.94566676	55.12944141
BENZO(K)FLUO	53.84282909	7.161399902	29.85104596	25.64912861	18.37648047
BERYLLIUM	0.290893185	0.188309841	0.453982025	2.682398156	0.085668823
BUTADIENE,13	18706.13205	11402.16088	33975.29243	32157.05546	6392.334011
CADMIUM	1.89822926	0.771859465	4.09582913	58.50567006	26.18636048
CARBON TETRA	8.001500879	16.67834697	28.06709636	34.75237445	0.29033917
CHLOROFORM	33.3596242	53.6172916	77.51252147	148.898165	10.05377295
CHROMIUM	55.510831	31.12107271	85.48577035	225.3893869	68.34611465
CHROMIUM VI	0	8.595E-07	0	0	0
CHRYSENE	323.0565638	42.96839956	179.1053876	153.9582108	110.2588828
COBALT	170.8687863	93.46030562	265.9718465	421.6936619	60.11984104
COPPER	13.47645715	4.724665184	11.90938384	17.75207799	260.6262892
DIBENZAHAN	107.6858525	14.3227998	59.70372431	51.29953981	36.75296094
DIBROMOET,12	17.2971419	25.55198321	41.2201128	41.70484642	6.072102446
DIBUTYL PHTH	4.580330078	2.49945	7.081110156	10.05005	1.61157998
DICHLORETH12	40.98734825	35.30143382	83.08283383	92.2610673	12.93807995
DIEYLHEX PHT	0	0	0	0	0
ETHYLBENZENE	3167.618423	2085.891038	5386.171394	6935.246852	1065.87797
ETHYLENE OXI	2130.094468	2938.7976	4858.388536	5160.9812	749.469533
FLUORANTHENE	538.4352402	71.61520545	298.5535956	256.6158495	188.2045624
FLUORENE	646.1334108	85.93679883	358.3760303	307.9179909	220.5177656
FORMALDEHYDE	554.2971529	302.6346604	858.2932367	1817.610697	1394.681782
GLYCOL ETHRS	1029.368898	615.0645	1638.392297	2273.2465	362.1814004
HEXCLBENZENE	0.000246301	0.003230889	0.000818588	0.000965886	0.000103832
INDN(123CDPY	538.4274544	71.61399902	298.5034337	256.4857657	183.7648047
LEAD	7.045589522	24.42234813	10.89235801	9335.459263	2.4789766039364141 350.16 77

	Cook	Cottonwood	Crow Wing	Dakota	Dodge
ACENAPHTHEN	33.4184814	34.83580275	561.0914103	474.9319596	40.98339844
ACENAPHTHYL	708.1799435	738.5154528	11895.09511	10066.81927	868.8480469
ACETALDEHYDE	30.63839313	0.109196563	1.310358754	53.24871105	0
ACROLEIN	0.066898154	0.013169077	0.158028924	6.420403875	0
ACRYLONITRIL	6.862776	19.33535	57.72343	1067.089453	33.92702
ANTHRACENE	46.78573896	48.77010705	785.5277729	705.8219537	57.37675781
ANTIMONY	0.0149552	0	0	284.0140453	0
ARSENIC	105.8574157	0.47150725	10.75257199	170.092791	0.620713387
ATRAZINE	15.12314947	16127.27895	1014.180337	9028.016279	10241.41228
BENZ(A)ANTHR	67.41867411	69.72553282	1122.390396	951.1579447	82.03836485
BENZ(GHI)PE	13.35510067	13.93430985	224.4364292	189.9673062	16.39335938
BENZENE	7523.662318	9385.867019	118997.6583	180569.9412	11822.06608
BENZO(A)PYRE	13.46140379	13.934267	224.4359215	189.9467185	16.39335938
BENZO(B)FLUO	20.03018886	20.90137446	336.6535599	295.6132198	24.59003906
BENZO(K)FLUO	6.676764349	6.967142184	112.2180617	94.97743485	8.196679688
BERYLLIUM	12.62200842	0.130615001	0.504071562	8.734334623	0.170953847
BUTADIENE,13	4300.473038	11492.72393	39880.46207	231871.4826	13500.07044
CADMIUM	7.309756038	0.665157464	4.214840896	62.66670547	0.860636118
CARBON TETRA	2.5827205	7.071348949	16.06920029	274.3111598	9.457648404
CHLOROFORM					

	Koochiching	Lac Qui Parle	Lake	Lake of the Woods	Le Sueur
ACENAPHTHEN	111.4162482	23.60101475	78.06759312	49.80439941	104.8472395
ACENAPHTHYL	2356.473441	500.3165544	1654.69419	1055.853268	2222.693734

	Lincoln	Lyon	Mc Leod	Mahnomen	Marshall

	Rice	Rock	Roseau	St Louis	Scott
ACENAPHTHEN	205.781172	26.19540826	171.5889147	1449.23817	98.35246442
ACENAPHTHYL	4362.286306	555.3283933	3637.186125	30716.3462	2084.341603
ACETALDEHYDE	9.602615336	0.436786251	52.48258969	1351.881101	22.89890225
ACROLEIN	1.014018929	0.052676308	0.109047231	23719.27888	2.674298631
ACRYLONITRIL	114.335	26.58589	75.06743	630.9795	347.6731
ANTHRACENE	288.0923473	36.67350437	240.1661357	2028.096376	137.6900375
ANTIMONY	4.01625	0	19.2	604.9945295	7.416672519
ARSENIC	9.684166468	0.434251518	0.657729466	8797.393243	14.15619371
ATRAZINE	7850.842822	12939.8567	588.5869592	15.12314947	3857.508765
BENZ(A)ANTHR					

	Sherburne	Sibley	Stearns	Steele	Stevens
ACENAPHTHEN	203.5353261	37.58	505.0908071	82.29698957	26.44600098
ACENAPHTHYL	4314.73855	796.696	10707.58639	1744.382417	560.6552207
ACETALDEHYDE	6.442597205	0	14.35980947	13.47476753	0
ACROLEIN	0.776975543	0	1.251062315	1.158878776	0
ACRYLONITRIL	148.1393	14.42289	182.329	115.5221	26.33576
ANTHRACENE	284.9484653	52.612	707.1255339	115.2143071	37.02440137
ANTIMONY	113.0001991	0	5.74875	0	0
ARSENIC	269.1722632	1.97193669	37.5994451	1.207799982	0.390082026
ATRAZINE	3078.762627	12305.9918	21804.88078	10504.01215	11029.21189
BENZ(A)ANTHR	407.3641845	75.38736341	1010.709353	165.4487775	52.93697824
BENZ(GHI)PE					

	Wright	Yellow Medicine	Portable Sources	State Total
ACENAPHTHEN	313.0529433	31.68340088	0.044826114	14403.13077
ACENAPHTHYL	6636.410882	671.6880986	0.142769879	305294.3692
ACETALDEHYDE	9.641100964	0	18.51162205	62048.35083
ACROLEIN	1.145897699	0	2.243523821	98267.57042
ACRYLONITRIL	254.4235	34.49603	0	8369.087552
ANTHRACENE	438.2742214	44.35676123	0.047794496	20234.05133
ANTIMONY	0.159737345	0	0	1414.932798
ARSENIC				

Appendix E: New York Toxic Emissions Inventory

Appendix F: Ohio Toxic Emissions Inventory

	Adams	Allen	Ashland	Ashtabula	Athens
ACENAPHTHENE	337	1309	613	1242	731
ACENAPHTHYLENE	3814	14839	6949	14078	8285
ACETALDEHYDE		44005			
ACROLEIN		3800			
ACRYLAMIDE		0			
ACRYLONITRILILE		126100			
ANTHRACENE	449	1746	818	1656	975
ANTIMONY					
ARSENIC					

	Champaign	Clark	Clermont	Clinton	Columbiana

	Coshocton	Crawford	Cuyahoga	Darke	Defiance

	Delaware	Erie	Fairfield	Fayette	Franklin
ACENAPHTHENE	963	943	1424	344	12233
ACENAPHTHYLENE	10912	10686	16142	3894	138636
ACETALDEHYDE					
ACROLEIN					
ACRYLAMIDE	0				15
ACRYLONITRILILE	3194				
ANTHRACENE	1284	1257	1899	458	16310
ANTIMONY					
ARSENIC					
ATRAZINE	5743	7574	4837	10957	14058
BENZ(A)ANTHRACENE	3851	3772	5697	1374	48930
BENZO(G,H,I)PERYLENE	163	321	314	475	115

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Highland	Hocking	Holmes	Huron	Jackson

	Jefferson	Knox	Lake	Lawrence	Licking
ACENAPHTHENE	962	612	2644	768	1661
ACENAPHTHYLENE	10901	6938	29969	8699	18828
ACETALDEHYDE					
ACROLEIN					
ACRYLAMIDE					
ACRYLONITRILILE			30842		
ANTHRACENE	1283	816	3526	13295	2215
ANTIMONY					
ARSENIC					
ATRAZINE	961	494	8320	145	197
BENZ(A)ANTHRACENE	3848	2449	10577	3070	6645
BENZO(G,H,I)PERYLENE	129	321	204	881	256
BENZENE	237789	151347	655247	242336	410698
BENZO(A)PYRENE	641	408	1763	512	1108
BENZO(B)FLUORATHNE	641	408	1763	512	1108

	Logan	Lorain	Lucas	Madison	Mahoning
ACENAPHTHENE	544	3423	5536	484	3241
ACENAPHTHYLENE	6168	38790	62739	5482	36728
ACETALDEHYDE			1400		
ACROLEIN					
ACRYLAMIDE		0			
ACRYLONITRILILE		6860			
ANTHRACENE	726	4564	7381	645	4321
ANTIMONY					
ARSENIC					
ATRAZINE	8683	10079	4171	3680	14415
BENZ(A)ANTHRACENE	2177	13691	22143	1935	12963
BENZO(G,H,I)PERYLENE	554	181	1141	1845	161
BENZENE	135047	846202	1397930	119574	801146
BENZO(A)PYRENE	363	2282	3691	322	2160
BENZO(B)FLUORATHNE	363	2282	3691	322	2160
BENZO(K)FLUORATHENE	181	1141	1845	161	1080
BERYLLIUM					
BUTADIENE,13			27		
CADMIUM	4	26	42	4	25
CARBON TETRACHLORIDE	52	326	527	46	308
CHLOROFORM					
CHROMIUM	5	261	1	0	950
CHRYSENE	907	5704	9226	806	5401
COBALT					250
COPPER	177	0	242	0	29
DIBENZO(A,H)ANTHRACENE	181	1141	1845	161	1080
1,2 DIBROMOETHANE					
DIBUTYL PHTHALATE	6933	43599	70522	6161	41282

	Monroe	Montgomery	Morgan	Morrow	Muskingum
ACENAPHTHENE	184	7034	171	365	1003
ACENAPHTHYLENE	2087	79716	1942	4141	11362
ACETALDEHYDE					
ACROLEIN					
ACRYLAMIDE		56			
ACRYLONITRILILE					
ANTHRACENE	246	9378	229	487	1337
ANTIMONY		86			
ARSENIC					
ATRAZINE	11257	397	5679	919	7049
BENZ(A)ANTHRACENE	737	28135	686	1462	4010
BENZO(G,H,I)PERYLENE	390	61	2345	57	122
BENZENE	45532	1739340	42369	90332	247834
BENZO(A)PYRENE	123	4689	114	244	668
BENZO(B)FLUORATHNE	123	4689	114	244	668

	Noble	Ottawa	Paulding	Perry	Pickaway
ACENAPHTHENE	145	486	250	407	628
ACENAPHTHYLENE	1640	5503	2837	4607	7117
ACETALDEHYDE					341631
ACROLEIN					
ACRYLAMIDE					
ACRYLONITRILILE					
ANTHRACENE	193	647	334	542	837
ANTIMONY	89				
ARSENIC					
ATRAZINE	3163	240	2606	8220	3374
BENZ(A)ANTHRACENE	579	1942	1001	1626	2512
BENZO(G,H,I)PERYLENE	334	48	162	83	136
BENZENE	35777	120040	61886	100498	262636
BENZO(A)PYRENE	96	324	167	271	419

Area Sources

Architectural Surface Coating

Dry Cleaning

Fuel Marketing

Graphic Arts

Industrial Surface Coating

Publicly Owned Treatment Works

Residential Wood Combustion

Residential Fuel Combustion

Traffic Markings

	Durham	Elgin	Essex	Frontenac	Grey
1,1,1-TRICHLOROETHANE	1,752	155	781	342	122
1,2-DIBROMOETHANE	5.49E-01	5.44E-02	3.07E-01	1.64E-01	4.37E-02
1,2-DICHLOROETHANE	37	4	19	10	3
1,3-BUTADIENE					
TCDD,2378	6.01E-06	2.57E-05	9.29E-06	1.79E-06	1.32E-05
TCDF,2378	5.69E-06	1.09E-04	2.50E-05	1.69E-06	5.41E-05
2,4,5-TRICHLOROPHENOL					
2,4,6-TRICHLOROPHENOL					
ACENAPHTHENE	98	40	70	93	62
ACENAPHTHYLENE	2,040	839	1,455	1,945	1,296
ACETALDEHYDE	54			86,062	
ACROLEIN					
ACRYLAMIDE					
ACRYLONITRILE					
ANTHRACENE	136	56	97	130	87
ANTIMONY		6	7.05E-01		3
ARSENIC	8	1	6	2	2
BENZ(A)ANTHRACENE	191	79	136	182	121
BENZENE	48,710	10,223	29,438	24,893	14,355

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	Huron	Kenora	Kent	Lambton	Lanark
1,1,1-TRICHLOROETHANE	105	114	1,158	288	122
1,2-DIBROMOETHANE		5.27E-02	7.71E-02	1.11E-01	3.72E-02
1,2-DICHLOROETHANE	6.99E-01	3	11	29	3
1,3-BUTADIENE				229,137	

Leeds and Grenville	Lennox and

	Parry Sound	Peel	Perth	Peterborough	Prescott and Russell
1,1,1-TRICHLOROETHANE	32	1,607	110	193	83
1,2-DIBROMOETHANE	3.49E-02	1.30E+00	4.46E-02	1.52E-01	2.46E-04
1,2-DICHLOROETHANE	2	73	3	8	5.53E-01
1,3-BUTADIENE					
TCDD,2378	5.22E-07	4.21E-05	1.58E-05	1.65E-06	9.70E-07
TCDF,2378	4.96E-07	7.67E-04	6.59E-05	1.66E-06	9.19E-07
2,4,5-TRICHLOROPHENOL		2.17E-02			
2,4,6-TRICHLOROPHENOL		2.11E-01			
ACENAPHTHENE	695	102	33	123	92
ACENAPHTHYLENE	14,558	2,129	701	2,583	1,922
ACETALDEHYDE		246			
ACROLEIN					
ACRYLAMIDE		355			
ACRYLONITRILE					
ANTHRACENE	972	142	47	172	128
ANTIMONY		22	3	6.89E-03	
ARSENIC	6.67E-01	76	1	2	1
BENZ(A)ANTHRACENE	1,364	199	66	242	180
BENZENE	130,731	85,076	8,809	28,865	18,586
BENZO(A)PYRENE	290	42	14	51	38
BENZO(B)FLUORANTHENE	418	104	20	74	55
BENZO(G,H,I)PERYLENE	277	66	13	49	37
BENZO(K)FLUORANTHENE	141	21	7	25	19
BERYLLIUM	3.97E-01	9	7.19E-01	1	7.36E-01
CADMIUM	705	15,049	1,273	2,176	1,305
CARBON TETRACHLORIDE	35	394	29	54	22
CHLORDANE					
CHLOROFORM	33	1,639	112	197	84
CHROMIUM	88	2,338	159	272	163
CHROMIUM (VI)		3.77E-03			
CHRYSENE	836	122	40	148	110
COBALT	281	6,074	507	868	521
COPPER	8	1,583	16	22	13
DIBENZO(A,H)ANTHRACENE	19	3	9.32E-01	3	3
DIBUTYL PHTHALATE	1	24	2	3	2
DIETHYLHEXYL PHTHALATE		4,409			
ETHYLBENZENE	4,541	123,470	269,807	69,068	8,191
ETHYLENE OXIDE		5,997			
FLUORANTHENE	1,351	203	65	240	178
FLUORENE	1,667	245	80	296	220
FORMALDEHYDE	732	14,929	1,160	1,988	1,174
GLYCOL ETHERS (MISC.)	2,702	56,244	4,763	8,160	4,887
HEXACHLOROBENZENE		8			
HYDRAZINE					
INDENO(1,2,3-C,D)PYRENE	78	50	4	14	10
LEAD	7	215	32	22	13
M-XYLENE	480	17,840	613	2,082	3
MANGANESE	21	301	17	31	19
MERCURY	4.76E-01	458	40	2	8.83E-01
METHYLENE CHLORIDE	3,376	782,863	6,162	10,556	6,289
METHYLENE(B)4-		2,205	223	1,166	
NAPHTHALENE	20,263	26,420	1,871	6,239	2,820
NICKEL	98	2,735	176	301	180
O-XYLENE	16,602	69,663	6,031	12,013	7,069
P-XYLENE	186	6,908	237	806	1

	Prince Edward	Rainy River	Renfrew	Simcoe	Stormont, Dundas
1,1,1-TRICHLOROETHANE	20	54	133	451	260
1,2-DIBROMOETHANE		1.47E-02	7.52E-02	3.88E-01	7.00E-02
1,2-DICHLOROETHANE	1.31E-01	1	4	21	5
1,3-BUTADIENE					
TCDD,2378	3.28E-07	3.26E-07	1.26E-06	4.33E-06	1.92E-06

	Victoria	Waterloo	Wellington	York	Prov. Total
1,1,1-TRICHLOROETHANE	81	633	273	59	310,906
1,2-DIBROMOETHANE	1.73E-02	4.96E-01	1.38E-01	9.30E-01	12
1,2-DICHLOROETHANE	1	27	8	43	744
1,3-BUTADIENE					229,137
TCDD,2378	9.26E-07	8.40E-06	3.65E-06	7.89E-06	3.88E-04
TCDF,2378	9.99E-07	1.86E-05	8.30E-06	7.88E-06	1.80E-03
2,4,5-TRICHLOROPHENOL					2.17E-02
2,4,6-TRICHLOROPHENOL					2.11E-01
ACENAPHTHENE	106	32	53	85	48,530
ACENAPHTHYLENE	2,218	669	1,112	1,776	360,980
ACETALDEHYDE		2,420	36	218	228,333
ACROLEIN					
ACRYLAMIDE					564
ACRYLONITRILE					18,849
ANTHRACENE	148	45	74	119	42,566
ANTIMONY	8.32E-03	7.21E-01	3.29E-01	2.84E-02	7,506
ARSENIC	1	7	3	10	60,763
BENZ(A)ANTHRACENE	208	63	104	166	46,530
BENZENE	21,475	25,447	16,751	40,851	5,073,924
BENZO(A)PYRENE	44	13	22	35	31,362

Appendix H: Pennsylvania Toxic Emissions Inventory

Fuel Oil Comb (Residential)	Gasoline Marketing (Stage II)
Gasoline Marketing (Truck Transit)	Gasoline Marketing (UST Breathing)
Graphic Arts	High Performance Coatings
Landfills	Machinery & Equipment
Marine Surface Coating	Metal Cans Surface Coating
Metal Furniture & Fixtures	Misc. Finished Metals
Misc. Manufacturing	Motor Vehicle Surface Coating
Other Special Purpose Coating	Pesticides
POTWs	Railroad
Traffic Line Painting	Wood Furniture

SAMPLE CALCULATIONS:

<u>Counties with a known number of employees</u>:

$$Emissions = (Emission\ Factor)(Employees)(ton\ conversion)(Activity\ Days)\left(\frac{SAF}{POS}\right)$$

where: *Emission Factor = 3,519 lbsVOC /employee/year*

PopulationUnknown = 3,456,818 people (1995 data)
Activity Days = 5 days ≈ (1 year/52 weeks)(1 week/5 days)
Seasonal Activity Factor = 0.25
Peak Ozone Season = 0.25 years (3 months)

$$Emissions = \left| \frac{lbsVOC \big/ employee}{year} \right| \left[\frac{(\quad employees - \quad employees)(\quad people)}{people} \right| \left(\frac{ton}{lbs} \right)$$

$$\left[\left(\frac{week}{activity\ days} \right) \left(\frac{year}{weeks} \right) \right| \left(\frac{}{} \right)$$

$$Emissions = \quad tonsVOC \quad year$$

Commercial and Consumer Solvent Use

Population = 547,592 (Delaware County)
Activity Days = 7 days ≈ 1 year/365 days
Seasonal Activity Factor = 0.25
Peak Ozone Season = 0.25 years (3 months)

$$\frac{Employees_{Unknown}}{Population_{County}} = \frac{Employees_{Unknown}}{Population_{Unknown}}$$

where: $Employees_{Unknown}$ = *unknown number of employees in county*
$Population_{County}$ = *population of county with unknown number of employees*
$Employees_{Unknown}$

Activity Days = 6 days ≈ (1 year/52 weeks)(1 week/6 days)
Seasonal Activity Factor = 0.25
Peak Ozone Season = 0.25 years (3 months)
Point Sources = 0.0645 lbsVOC/day (Allegheny County)

$$Emissions \quad \frac{lbsVOC/Employee}{year}\left(\quad Employees \quad Employees\right)\frac{ton}{lbs}\quad\frac{year}{\quad}\quad\frac{\quad}{\quad}$$

$Total\ Employees = 3{,}436\ Employees$

$Employees_{Known} = 1{,}826\ Employees$

$Population_{County} = 83{,}998$ People (1995 est. census)

$Population_{Unknown} = 6{,}124{,}581$ People (1995 est. census) E

Electrical Insulation

therefore:

$$Emissions = (Emission\ Factor)\left[\frac{(County\ Population)\left(\frac{County\ Dwelling\ Units}{County\ Population}\right)(Dwelling\ Unit\ Factor)}{County\ DU_{FO}}\right]$$

$$(Distillate\ Useage + Kerosene\ Useage)(ton\ conversion)(Activity\ Days)\left(\frac{SAF}{POS}\right)$$

where: *Emission Factor = 0.713 lbs VOC/1000 gallons/year; 18 lbs NOx/1000 gallons/year; 5 lbs CO/1000 gallons/year*

1995 County Population = 1,309,821 people (Allegheny County)

1990 County Dwelling Units = 541,261 Dwelling Units

1990 County Population = 1,336,449 people

% DU_{FO} = % Dwelling Units which use fuel oil = 1.9%

County DU_{FO} =1,290,615 Dwelling Units

Residential Fuel Oil Useage = Distillate Oil Useage + Kerosene Useage

= 826,651,000 gallons + 86,682,000 gallons

= 913,333,000 gallons

Activity Days = 7 days ≈ 1 year/365 days

Seasonal Activity Factor = 0.08 (VOC), 0.08 (NOx), 0.43 (CO)

Peak Ozone Season = 0.25 years (3 months)

<u>*VOC Emissions*</u>

$$Emissions \quad \frac{lbsVOC / gallons}{year} \quad \frac{(\quad people)\ Dwelling\ Units / people g(\quad)}{}$$

$$(\qquad\qquad)\ \_\_\_\ \_\_\_\ \_\_$$

Emissions

Seasonal Activity Factor = 0.15 (VOC), 0.15 (NOx), 0.35 (CO)
Peak Ozone Season = 0.25 years (3 months)

<u>VOC Emissions</u>

$$Emissions_{VOC} = \left| \frac{lbsVOC \Big/ \quad gallons}{year} \right| \left(\frac{Facilities}{Facilities} \right) \Big| \Big(\qquad gallons \Big)$$

$$\left(\frac{ton}{lbs} \quad \frac{year}{weeks} \quad \frac{week}{days} \quad \frac{\quad}{\quad} \right.$$

$$Emissions_{VOC} \qquad tonsVOC \quad day$$

$Emissions_{VOC}$ = *Residential + Commercial - Point Sources*
= *0.0022 tonsVOC/day + 0.0133 tonsVOC/day - 0.0569 tonsVOC/day*
= *-0.0414 tonsVOC/day ≈ 0.0000 tonsVOC/day*

$Emissions_{NOx}$ = *Residential + Commercial*
= *0.0563 tonsNOx/day + 0.7821 tonsNOx/day*
= *0.8384 tonsNOx/day*

$Emissions_{CO}$ = *Residential + Commercial*
= *0.0840 tonsCO/day + 0.4562 tonsCO/day*
= *0.5402 tonsCO/day*

Gasoline Marketing

SAMPLE CALCULATION:

<u>Stage I</u>:

$$Emissions = (EmissionFactor)(State\ Throughput)\left(\frac{CountyVMT}{StateVMT}\right)(Control\ Efficiency)(Rule\ Effectiveness)(ton\ conversion)$$

where: Emission Factor = 0.3 lbs VOC/1000 gallons

State Throughput = 13,969,015 gallons/day
County VMT = 19,013,693 VMT (Montgomery County)
State VMT = 289,714,968 VMT
Control Efficiency = 0.96 ≈ (1-0.96)
Rule Effectiveness = 0.8 ≈ (1-0.8)

$$Emissions = \left(\frac{lbsVOC}{gallons} \right)\left(\frac{gallons}{day} \right)\left(\frac{VMT}{VMT} \right)(\; - \;)(\; - \;)\left(\frac{ton}{lbs} \right)$$

$$Emissions = \quad tonsVOC \quad day$$

Stage II

$$Emissions = (EmissionFactor)(State\,Throughput)\left(\frac{CountyVMT}{StateVMT} \right)(Rule\,Effectiveness)(ton\,conversion)$$

where: Emission Factor = 1.8 lbs VOC/1000 gallons (for counties with Stage II)
= 11.7 lbsVOC/1000 gallons (for counties without Stage II)
State Throughput = 13,969,015 gallons/day
County VMT = 19,013,693 VMT (Montgomery County)
State VMT = 289,714,968 VMT
Rule Effectiveness = 0.9 (1-0.9) (not applicable for counties without Stage II)

$$Emissions = \left(\frac{lbsVOC}{gallons} \right)\left(\frac{gallons}{day} \right)\left(\frac{VMT}{VMT} \right)(\; - \;)\left(\frac{ton}{lbs} \right)$$

$$Emissions = \quad tonsVOC \quad day$$

Underground Storage Tank Breathing

$$Emissions = (EmissionFactor)(State\,Throughput)\left(\frac{CountyVMT}{StateVMT} \right)(ton\,conversion)$$

where: Emission Factor = 1.0 lbs VOC/1000 gallon
State Throughput = 13,969,015 gallons/day
County VMT = 19,013,693 VMT (Montgomery County)
State VMT = 289,714,968 VMT

$$Emissions = \left(\frac{lbsVOC}{gallons} \right)\left(\frac{gallons}{day} \right)\left(\frac{VMT}{VMT} \right)\left(\frac{ton}{lbs} \right)$$

$$Emissions = \quad tonsVOC \quad day$$

Truck Transit

$$Emissions = (EmissionFactor)(State\,Throughput)\left(\frac{CountyVMT}{StateVMT}\right)(ton\,conversion)$$

$$Emissions = \left| \frac{lbsVOC \big/ person}{year} \right| (\qquad persons) \left(\frac{ton}{lbs} \right| \left[\left(\frac{year}{weeks} \right| \left(\frac{week}{days} \right| \quad \| \left(\frac{}{} \right)$$

$$- \qquad tonsVOC \quad day$$

$$Emissions = \qquad tonsVOC \big/ day$$

SAMPLE CALCULATION:

$$Emissions = (Emission\ Factor)(Precipitation\ Adjustment\ Factor)(Amount\ of\ Waste)(Activity\ Days)$$

where: *Emission Factor = 13.6 tonsVOC/10^6 tons of waste*
Precipitation Adjustment Factor = 2.6
Amount of Waste = 20,959,149 tons of refuse
Activity Days = 7 days ≈ 1 year/365 days

$$Emissions = \left| \frac{tons\,VOC \Big/ tons\,refuse}{year} \right| (\quad)(\qquad tons\,of\ refuse)\left(\frac{year}{days}\right)$$

$$Emissions = \qquad tonsVOC \quad day$$

Machinery and Equipment

SAMPLE CALCULATION:

$$Emissions = (Emission\ Factor)(Employees)(ton\ conversion)[Activity\ Days]\left(\frac{SAF}{POS}\right)$$

where:

$$Emissions = \left| \frac{lbsVOC / Employee}{year} \right| (\quad Employees) \left(\frac{ton}{lbs} \right) \left[\left(\frac{year}{weeks} \right) \left(\frac{week}{days} \right) \right| \left(\frac{}{} \right)$$

$$- \frac{tonsVOC}{day}$$

$$Emissions = \quad tonsVOC \quad day$$

Metal Furniture and Fixtures

Pennsylvania

$$Emissions = (Emission\ Factor)(Employees)(ton\ conversion)[Activity\ Days]\left(\frac{SAF}{POS}\right) - Point\ Sources$$

where: *Emission Factor = 2,877 lbsVOC /employee/year*
Employees = 99 employees (Westmoreland County)
Activity Days = 6 days ≈ (1 year/52 weeks)(1 week/6 days)
Seasonal Activity Factor = 0.25
Peak Ozone Season = 0.25 years (3 months)
Point Sources = 0.1765 tonsVOC/day (Westmoreland County)

$$Emissions = \left|\frac{lbsVOC/Employee}{year}\right|(\quad Employees)\left(\frac{ton}{lbs}\right)\left[\left(\frac{year}{weeks}\right)\left(\frac{week}{days}\right)\right]\left(\frac{}{}\right)$$

$$-\frac{tonsVOC}{day}$$

$$Emissions = \quad tonsVOC\quad day$$

Miscellaneous Manufacturing

SAMPLE CALCULATION:

$$Emissions = (Emission\ Factor)(Population)(ton\ conversion)(Activity\ Days)\left(\frac{SAF}{POS}\right)$$

where: *Emission Factor = 0.6 lbs VOC/capita/year*
Population = 321,309 (Luzerne County)
Activity Days = 6 days ≈ (1 year/52 weeks)(1 week/6 days)
Seasonal Activity Factor = 0.25
Peak Ozone Season = 0.25 years (3 months)

$$Emissions = \left|\frac{lbsVOC/person}{year}\right|(\quad persons)\left(\frac{ton}{lbs}\right)\left[\left(\frac{year}{weeks}\right)\left(\frac{week}{days}\right)\right]\left(\frac{}{}\right)$$

$$Emissions = \quad tonsVOC/day$$

$$Emissions = \left| \frac{lbsVOC \big/ person}{year} \right| \left(\qquad persons \right) \left(\frac{ton}{lbs} \right) \left[\left(\frac{year}{weeks} \right) \left(\frac{week}{activity\ days} \right) \right] \left(\frac{\quad}{\quad} \right)$$

$$- \qquad tonsVOC \quad day$$

$$Emissions = \qquad tonsVOC \quad day$$

$$Emissions = (Emission\ Factor)(Flow)(Industrial\ Discharge\ Adjustment)(ton conversion)(Activity Days)$$

$$\left|\frac{SAF}{POS}\right| - Point\ Sources$$

where: *Emission Factor = 0.00011lbsVOC /gallon flow/year*
Flow = 91,623.71 million gallons (Allegheny County)
Industrial Discharge Adjustment = 16%
Activity Days = 7 days ≈ 1 year/365 days
Seasonal Activity Factor = 0.35
Peak Ozone Season = 0.25 years (3 months)
Point Sources = 0.1240 tonsVOC/day

$$Emissions = \left|\frac{lbsVOC/gallon}{year}\right|(\quad E \quad gallons)(\quad)\left(\frac{ton}{lbs}\right)\left(\frac{year}{days}\right)$$

$$\left(\frac{}{}\right) - \frac{tonsVOC}{day}$$

$$Emissions = \quad tonsVOC \quad day$$

Railroad Solvents

x *Pennsylvania Industrial Directory*

SAMPLE CALCULATION:

$$Emissions = (Emission\ Factor)(Employees)(ton\ conversion)(Activity\ Days)$$

Traffic Line Painting

Point Sources = 0.0792 tonsVOC/day (Lancaster County)

[redacted]

	Adams	Allegheny	Armstrong	Beaver	Bedford
1,3-BUTADIENE	10.40000003	0	10.40000003	0.3402	31.19999915
ACETALDEHYDE					
ACROLEIN	0				
ACRYLONITRILE	0				
ANTIMONY					
ARSENIC	0.17424		3997.498752	4654.72311	0.0112409
BENZENE	73460.25202	426227.6033	46313.09333	82600.52891	63704.41845
BERYLLIUM			571.0628	664.89374	
CADMIUM	0.0191664		0.006506678	85.97295826	0.001236499

	Berks	Blair	Bradford	Bucks	Butler
1,3-BUTADIENE	42121.08	176.7999977	0	0	0
ACETALDEHYDE	2556.110935			0.0144392	
ACROLEIN	958.536				
ACRYLONITRILE	0	46478			
ANTIMONY					
ARSENIC	3.99064356	0.07424438	0.33257368	0.59652856	0.9323804
BENZENE	218184.7515	112301.5929	80728.64368	232701.0437	89434.61868
BERYLLIUM	4.22247				577.106
CADMIUM	0.632972792	0.008166882	0.036583105	0.065618142	0.102561844

	Fayette	Forest	Franklin	Fulton	Greene
1,3-BUTADIENE	62.39999831	10.40000003	10.40000003	0	0
ACETALDEHYDE					
ACROLEIN					
ACRYLONITRILE					
ANTIMONY					
ARSENIC	0.0523538		0.0206726		2410.198573
BENZENE	58853.95154	2736.800063	122727.7743	28108.20043	23413.73794
BERYLLIUM					344.3122

	Lycoming	McKean	Mercer	Mifflin	Monroe
1,3-BUTADIENE	0	0	10.40000003	0	353.5999954
ACETALDEHYDE			0.9678824		0.00101664
ACROLEIN					
ACRYLONITRILE					
ANTIMONY					

	Philadelphia	Pike	Potter	Schuylkill	Snyder
1,3-BUTADIENE	0	31.19999915	0	52.00000107	0
ACETALDEHYDE				0.0169536	
ACROLEIN					
ACRYLONITRILE					

	Somerset	Sullivan	Susquehanna	Tioga	Union
1,3-BUTADIENE	0	0	41.60000011	135.1999938	0

	Venango	Warren	Washington	Wayne	Westmoreland	
1,3-BUTADIENE	20.80000006	0	0	0	93.59999746	
ACETALDEHYDE						
ACROLEIN						
ACRYLONITRILE					53206.6	
ANTIMONY						
ARSENIC	9.7605382	118.7292405	1057.572953	1.74346	0.91786352	
BENZENE	31826.60683	30186.22002	104971.3783	30900.60011	158580.0733	BENZ072 -0.72

	Wyoming	York	Grand Total
1,3-BUTADIENE	0	0	58389.22537
ACETALDEHYDE		0.0014972	2573.891048
ACROLEIN		0.0014972	958.5600708
ACRYLONITRILE		0	2057452.2
ANTIMONY			752.0300698
ARSENIC	0.66102	1907.095567	34918.04619
BENZENE	20105.51904	223269.3414	5930380.25
BERYLLIUM		450.1654	8055.09366
CADMIUM	0.0727122	90393.41705	173824.7209

Appendix I: Wisconsin Toxic Emissions Inventory

Landfills

Publicly Owned Treatment Works

	[redacted]	[redacted]	[redacted]	Chippewa	Clark
TADIENE	[redacted]	[redacted]	[redacted]	19213.06	13667.47
TCDF	[redacted]	[redacted]	[redacted]	2.03E-05	1.19E-05
TCDD	[redacted]	[redacted]	[redacted]	7.73E-07	4.54E-07
RICHLOPHEN	[redacted]	[redacted]	[redacted]		
E34DII	[redacted]	[redacted]	[redacted]		
HTHEN	[redacted]	[redacted]	[redacted]	522.46	493.45
HTHY	[redacted]	[redacted]	[redacted]	7619.17	7196.17
DEHYDE	[redacted]	[redacted]	[redacted]	1993.93	1229.56
IN	[redacted]	[redacted]	[redacted]	1865.92	1150.62
[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	4.64	3.87	4.77	17.67	8.95

[redacted]

Dane	Dodge	Door
14740.68	2491.03	698.80
1.52E-04	2.86E-05	1.07E-05
5.79E-06	1.09E-06	4.08E-07
85.00		
442.24	214.91	175.79
8403.49	4083.82	3340.66
29070.15	4912.58	1381.64
27203.84	4597.19	1290.74
131.87	69.73	64.64
602.48	292.78	239.50
	3.87	
107.83	29.42	3.10
18602.87	12415.57	1573.45
933.64	453.71	371.23
181182.01	58227.61	39032.70
1460.81	308.83	137.69
263.33	127.96	104.67
216.22	105.07	85.94
92.42	44.91	36.73
314.68	37.44	23.49
833.67	80.57	27.02
924.73	198.20	63.71
1.77	0.87	
548.65	2.7261	218.30

	Forest	Grant	Green	Green Lake	Iowa
1,3-BUTADIENE	7411.36	18357.15	13746.34	10260.86	10515.91
2378, TCDF	3.50E-06	1.83E-05	1.23E-05	7.65E-06	7.88E-06
2378, TCDD	1.33E-07	6.96E-07	4.68E-07	2.91E-07	3.00E-07
246, TRICHLOPHEN					
TOLUENE34DII			4.00		
ACENAPHTHEN	190.04	370.90	139.13	109.41	181.93
ACENAPHTHY	2363.33	3593.91	2643.95	2079.42	1762.99

	Iron	Jackson	Jefferson	Juneau	Kenosha
1,3-BUTADIENE	6793.04	9550.17	2609.81	10986.85	6827.84
2378, TCDF	2.77E-06	6.65E-06	2.56E-05	8.79E-06	5.00E-05
2378, TCDD	1.05E-07	2.53E-07	9.73E-07	3.35E-07	1.91E-06
246, TRICHLOPHEN					

	Kewaunee	La Crosse	Lafayette	Langlade	Lincoln
1,3-BUTADIENE	559.95	33050.46	9477.42	11003.50	12565.21
2378, TCDF	7.19E-06	3.90E-05	6.25E-06	8.05E-06	1.08E-05
2378, TCDD	2.74E-07	1.49E-06	2.38E-07	3.07E-07	4.12E-07
246, TRICHLOPHEN					
TOLUENE34DII					
ACENAPHTHEN	88.93	272.57	91.79	302.64	335.48
ACENAPHTHY	1689.97	2641.25	889.57	3763.58	4171.90
ACETALDEHYDE	1104.29	6915.19	614.16	1939.56	2601.47
ACROLEIN	1033.39	6471.21	574.73	1815.04	1255.33
ACRYLAMIDE					
ACRYLONITRIL	32.70	51.31	28.95	15.23	10.61
ANTHRACENE	121.15	312.37	105.20	362.53	401.87
ANTIMONY					
ARSENIC	2.08	61.31	1.81	2.34	3.14
ATRAZINE	2810.91	2954.33	10653.63	909.65	516.29

	Manitowoc	Marathon	Marinette	Marquette	Menominee
1,3-BUTADIENE	3733.98	36406.80	18363.04	8389.07	
2378, TCDF	3.20E-05	4.42E-05	1.65E-05	5.14E-06	1.15E-06
2378, TCDD	1.22E-06	8.17E-05	6.30E-07	1.96E-07	4.37E-08
246, TRICHLOPHEN					
TOLUENE34DII					
ACENAPHTHEN	220.17	972.13	481.46	171.97	49.77

965CBS

Milwaukee	Monroe	Oconto

	Ozaukee	Pepin	Pierce	Polk	Portage

	Price	Racine	Richland	Rock	Rusk
1,3-BUTADIENE	9431.39	8899.81	9538.31	7161.30	9128.06
2378, TCDF	6.44E-06	6.78E-05	7.01E-06	5.56E-05	6.06E-06
2378, TCDD	2.45E-07	2.58E-06	2.67E-07	2.12E-06	2.31E-07
246, TRICHLOPHEN					
TOLUENE34DII					
ACENAPHTHEN	371.82	105.28	222.15	224.68	337.37
ACENAPHTHY	3741.21	2000.81	2152.77	4269.62	3394.60
ACETALDEHYDE	756.08	17551.35	24.29	14122.83	414.27
ACROLEIN	1504.54	16424.55	22.73	13220.14	387.67
ACRYLAMIDE					
ACRYLONITRIL	5.04	322.03	9.25	875.23	46.77
ANTHRACENE	418.14	143.44	254.58	306.10	379.41
ANTIMONY					
ARSENIC	18.88	19.76	2.04	377.35	1.75
ATRAZINE	426.14	3794.33	3183.79	13267.86	1458.72

	Taylor	Trempealeau	Vernon	Vilas	Walworth
1,3-BUTADIENE	10251.58	11977.34	11898.01	9725.82	2094.68
2378, TCDF	7.12E-06	1.01E-05	1.03E-05	7.76E-06	2.94E-05
2378, TCDD	2.71E-07	3.85E-07	3.94E-07	2.96E-07	1.12E-06
246, TRICHLOPHEN					
TOLUENE34DII					

Washburn Washington

	Winnebago	Wood	State Total
1,3-BUTADIENE	8121.66	26025.92	833153.75
2378, TCDF	5.66E-05	2.92E-05	1.94E-03
2378, TCDD	2.16E-06	1.11E-06	3.10E-03
246, TRICHLOPHEN			12783.93
TOLUENE34DII			164.91
ACENAPHTHEN	173.36	468.38	19439.35
ACENAPHTHY	3294.21	6830.51	260667.91
ACETALDEHYDE	16016.76	62456.04	651286.24
ACROLEIN	15207.28	7896.26	328514.65
ACRYLAMIDE	255.00	1.47E-03	255.00
ACRYLONITRIL	89.80	66.00	3919.18
ANTHRACENE	236.17	581.36	23705.26

J. Architectural Surface Coating

K. Autobody Refinishing

Spatial and temporal resolution

L. Consumer and Commercial Solvent Use

Adjusting for regulations and control of VOC and HAP's

EF_A	=	emission factor for pollutant A
Q	=	activity factor for category
CE	=	control efficiency/100
RP	=	rule penetration/100
RE	=	rule effectiveness/100
UAE_A	=	uncontrolled area source emissions of pollutant A
CAE_A	=	controlled area source emissions of pollutant A

Spatial and temporal resolution

M. Chromium Electroplating

Emission Factors

Facility Identification

√

N. Drycleaners

O. Gasoline Marketing

Identification of Emission Factors

1 2 3 5

Introduction

Source Identification

P. Graphic Arts

VOCs

For facility survey

Q. Industrial Surface Coatings

Speciate

Speciation of VOC emissions

R. Marine Vessel Loading, Ballasting and Transit

Method 1

Petroleum Refining

S. Municipal Landfills

T. Pesticides

Example

Adams County

U. Publicly Owned Treatment Works

V. Residential Fuel Combustion

W. Residential Wood Combustion

Industry	Equipment	Floor	Large	Line	Parts	Small	Spray	Spray	Tank	Total

SIC	AMS CODE	DESCRIPTION	INDUSTRY DESCRIPTION
25	2415005000	TOTAL: ALL SOLVENTS	FURNITURE & FIXTURES
33	2415010000	TOTAL: ALL SOLVENTS	PRIMARY METAL INDUSTRY
33	2415015000	TOTAL: ALL SOLVENTS	SECONDARY METAL INDUSTRY
34	2415020000	TOTAL: ALL SOLVENTS	FABRICATED METAL
35	2415025000	TOTAL: ALL SOLVENTS	INDUSTRIAL MACHINERY & EQUIPMENT
36	2415030000	TOTAL: ALL SOLVENTS	ELECTRONIC AND OTHER ELEC.
37	2415035000	TOTAL: ALL SOLVENTS	TRANSPORTATION EQUIPMENT
38	2415040000	TOTAL: ALL SOLVENTS	INSTRUMENTS AND RELATED PRODUCTS
39	2415045000	TOTAL: ALL SOLVENTS	MISC MANUFACTURING
40-45	2415050000	TOTAL: ALL SOLVENTS	TRANSPORTATION MAINTENANCE FACILITIES
55	2415055000	TOTAL: ALL SOLVENTS	AUTOMOTIVE DEALERS
75	2415060000	TOTAL: ALL SOLVENTS	AUTO REPAIR SERVICES

STAPPA-ALAPCO-EPA Emission Inventory Improvement Program (EIIP).

County Business Patterns 1995.

1996 Annual Survey of Manufacturers M96(AS)-1, Statistics for Industry Groups and Industries.

Y. Traffic Markings

Appendix Z: Index of SIC Code

SIC	DESCRIPTION
01	Agricultural Production-crops
011	Cash Grains
0111	Wheat
0112	Rice
0115	Corn
0116	Soybeans
0119	Cash Grains, n.e.c.
0130	Field Crops, Except Cash Grains
0131	Cotton
0132	Tobacco
0133	Sugar Crops
0134	Irish Potatoes
0139	Field Crops Except Cash Grains
016	Vegetables and Melons
0161	Vegetables and Melons
017	Fruits and Tree Nuts
0171	Berry Crops
0172	Grapes
0173	Tree Nuts
0174	Citrus Fruits
0175	Deciduous Tree Fruits
0179	Fruits and Tree Nuts, n.e.c.
018	Horticultural Specialties
0181	Ornamental Nursery Products
0182	Food Crops Grown under Cover
0189	Horticultural Specialties, n.e.c.
019	General Farms, Primarily Crop
0191	General Farms Primarily Crop
02	Agricultural Production-livestock & Animal Special
021	Livestock, Except Dairy and Poultry
0211	Beef Cattle Feedlots
0212	Beef Cattle Except Feedlots
0213	Hogs
0214	Sheep and Goats
0219	General Livestock, n.e.c.
024	Dairy Farms
0241	Dairy Farms
025	Poultry and Eggs
0251	Broiler, Fryer, and Roaster Chickens
0252	Chicken Eggs
0253	Turkeys and Turkey Eggs
0254	Poultry Hatcheries
0259	Poultry and Eggs, n.e.c.
027	Animal Specialties
0271	Fur-bearing Animals and Rabbit
0272	Horses and Other Equines
0273	Animal Aquaculture
0279	Animal Specialties, n.e.c.
029	General Farms, Primarily Livestock and Animal Specialties
0291	General Farms Primarily Livestock

SIC	DESCRIPTION
07	Agricultural Services
071	Soil Preparation Services
0711	Soil Preparation Services
072	Crop Services
0721	Crop Planting and Protection
0722	Crop Harvesting
0723	Crop Prep Services for Market
0724	Cotton Ginning
0729	General Crop Services
074	Veterinary Services
0741	Veterinary Services Farm Livestock
0742	Veterinary Services Specialties
075	Animal Services, Except Veterinary
0751	Livestock Services, Except Specialties
0752	Animal Specialty Services
076	Farm Labor and Management Services
0761	Farm Labor Contractors
0762	Farm Management Services
078	Landscape and Horticultural Services
0781	Landscape Counseling and Planning
0782	Lawn and Garden Services
0783	Ornamental Shrub and Tree Services
08	Forestry
0783es	

SIC	DESCRIPTION
1051	Bauxite and Other Aluminum Ore
106	Ferroalloy Ores, Except Vanadium
1061	Ferroalloy Ores Except Vanadium
108	Metal Mining Services
1081	Metal Mining Services
109	Miscellaneous Metal Ores
1092	Mercury Ores
1094	Uranium-Radium-Vanadium Ores
1099	Metal Ores, n.e.c.
1111	Anthracite
1112	Anthracite Mining Services
12	Coal Mining
1211	Bituminous Coal and Lignite
1213	Bituminous & Lignite Mine Services
122	Bituminous Coal and Lignite Mining
1221	Bituminous Coal & Lignite - Surface
1222	Bituminous Coal & Lignite - Underground
123	Anthracite Mining
1231	Anthracite Mining
124	Coal Mining Services
1241	Coal Mining Services
13	Oil and Gas Extraction
131	Crude Petroleum and Natural Gas
1311	Crude Petroleum & Natural Gas
132	Natural Gas Liquids
1321	Natural Gas Liquids
138	Oil and Gas Field Services
1381	Drilling Oil and Gas Wells
1382	Oil and Gas Exploration Service
1389	Oil and Gas Field Services, n.e.c.
14	Mining and Quarrying of Nonmetallic Minerals
141	Dimension Stone
1411	Dimension Stone
142	Crushed & Broken Stone, Including Riprap
1422	Crushed and Broken Limestone
1423	Crushed and Broken Granite
1429	Crushed and Broken Stone, n.e.c.
144	Sand and Gravel
1442	Construction Sand and Gravel
1446	Industrial Sand
145	Clay, Ceramic, and Refractory Minerals
1452	Bentonite
1453	Fire Clay
1454	Fullers Earth
1455	Kaolin and Ball Clay
1459	Clay and Related Minerals, n.e.c.
147	Chemical & Fertilizer Mineral Mining
1472	Barite
1473	Fluorspar
1474	Potash Soda & Borate Minerals
1475	Phosphate Rock
1476	Rock Salt
1477	Sulfur
1479	Chemical and Fertilizer Mining
148	Nonmetallic Minerals Services, Except Fuels
1481	Nonmetallic Minerals Services
149	Miscellaneous Nonmetallic Minerals, Except Fuels
1492	Gypsum

SIC	DESCRIPTION
1496	Talc Soapstone & Pyrophyllite
1499	Nonmetallic Minerals, n.e.c.
15	Building Construction-General Contractors & Builders
152	General Building Contractors-Residential Buildings
1521	Single-family Housing Construction
1522	Residential Construction, n.e.c.
153	Operative Builders
1531	Operative Builders
154	General Building Contractors-Nonresidential Buildings
1541	Industrial Building/Warehouses
1542	Nonresidential Construction N.e.c.
16	Heavy Construction other than Building Construction-Contract
161	Highway & Street Construction, Except Elevated Highway
1611	Highway and Street Construction
162	Heavy Construction, Except Highway & Street Construction
1622	Bridge Tunnel & Elevated Hwy
1623	Water Sewer and Utility Lines
1629	Heavy Construction, n.e.c.
17	Construction-special Trade Contractors
171	Plumbing, Heating, and Air-conditioning
1711	Plumbing Heating Air Condition
172	Ainting and Paper Hanging
1721	Painting and Paper Hanging
173	Electrical Work
1731	Electrical Work
174	Masonry, Stoneworks, Tile Setting, & Plastering
1741	Masonry and Other Stonework
1742	Plastering Drywall/Insulation
1743	Terrazzo Tile Marble Mosaic Work
175	Carpentry and Floor Work
1751	Carpentry Work
1752	Floor Laying & Floor Work, n.e.c.
176	Roofing, Siding, and Sheet Metal Work
1761	Roofing and Sheet Metal Work
177	Concrete Work
1771	Concrete Work
178	Water Well Drilling
1781	Water Well Drilling
179	Misc. Special Trade Contractors
1791	Structural Steel Erection
1793	Glass and Glazing Work
1794	Excavating and Foundation Work
1795	Wrecking and Demolition Work
1796	Installing Building Equipment
1799	Special Trade Contractors, n.e.c.
20	Food and Kindred Products
201	Meat Products
2011	Meat Packing Plants
2013	Sausages & Other Prepared Meat
2015	Poultry

Appendix AA

Appendix BB